\*\*\*1AC Heg Advantage\*\*\*

## Scenario 1 is Leadership----

Nations are challenging the US in space—increasing space missile defense protects space assets and maintains hegemony while avoiding an EMP attack

**Lambakis 7**—Steven Lambakis, senior analyst in spacepower and policy studies at the National Institute for Public Policy, February 1, 2007, “Missile Defense From Space” Hoover Institution, Policy Review No. 141, online: http://www.hoover.org/publications/policy-review/article/6124

National economic and commercial interrelationships thrive on the flow of invisible ones and zeros through space channels, so that timely, agile intercontinental trade is now taken for granted. U.S. and coalition forces routinely leverage earth-circling platforms to enhance military capabilities: the Global Positioning System for improved navigation and precision timing, reconnaissance and early warning sensors, and high-bandwidth communications. Space, moreover, is an open arena, a global commons increasingly used by many countries for military purposes. The proliferation of space technologies offers foreign governments and nonstate entities unparalleled opportunities to enhance diplomatic and military influence over the U.S. and strike with strategic effect. Potential enemies of the United States today have improved “vision” over the U.S. homeland and battlefield activities, a better sense of direction and geographic position, and an improved ability to mobilize forces and coordinate activities. With battle space now reaching up to at least 22,000 miles above the Earth — the orbital altitudes for early warning and communications satellites — **protecting ourselves from future attacks will depend mightily on space power.** But the country lacks a unified, coherent approach to expanding the use of space to improve combat effectiveness, a problem that is compounded by a politically charged debate over weapons in space.1 Critics contend that weapons in space would destabilize existing security relationships, precipitate an arms race, undermine U.S. foreign policy, and seed anti-American coalitions. Not only are **such criticisms based on questionable assumptions,**2 but they also have not persuaded the country to forgo the advantages of space weapons. The most one could say at this stage is that the American people are indifferent, noncommittal, and confused. Given the unpredictable global threats we expect to face, it makes sense to explore taking combat missions to space. Yet given the efficiencies space offers, and given the unpredictable, catastrophic, and global nature of threats we expect to face, it makes sense to explore the possible benefits of taking other combat missions to space. Once the benefits of active space defense programs and operations are made plain, the support of the American people will be forthcoming. There are several space combat mission areas of interest to the future defense of the United States, **including** space control,3 offensive strike,4 and **ballistic missile defense**. Each combat mission offers very different operational and strategic possibilities, and each should be evaluated separately and judged independently. Recognizing that weapons that leverage Earth orbits can make different contributions to national defense strategy, lumping them together in order to draw a general conclusion about the prudence of deploying “weapons in space” makes little sense. Our progress in this area will depend greatly on our ability to mature our rhetoric so that we can make meaningful distinctions. So I will focus here on the possible advantages of adding a space-based layer leveraging hit-to-kill interceptors to the newly deployed U.S. missile defense system. Highly effective missile defenses would appear to offer a very significant payoff over the long term when one takes threat and national vulnerability to catastrophic attack into consideration.5 Missile defense The ballistic missile threat to the United States, its deployed forces, and allies and friends has been well defined.6 This is a threat we downplay at our peril. Nations such as North Korea and Iran — which also have significant programs to develop nuclear, biological, and chemical weapons — as well as nonstate groups can pose significant, even catastrophic, dangers to the U.S. homeland, our troops, and our allies. Russia and China, two militarily powerful nations in transition, have advanced ballistic missile modernization and countermeasure programs. Indeed, despite the reality that trade relations with China continue to expand, its rapid military modernization represents a potentially serious threat. Whether these nations become deadly adversaries hinges on nothing more than a political change of heart in their respective capitals. The intelligence community’s ability to provide timely and accurate estimates of ballistic missile threats is, by many measures, poor. Our leaders have been consistently surprised by foreign ballistic missile developments. Shortened development timelines and the ability to move or import operational missiles, buy components, and hire missile experts from abroad mean the United States may have little or no warning before it is threatened or attacked. There is no escaping the uncertainty we face. And the stakes couldn’t be higher. A ballistic missile delivering a nuclear payload to an American city would be truly devastating. For comparison, the Insurance Information Institute estimates total economic loss so far from Hurricane Katrina at more than $100 billion. By some calculations, it is going to take New Orleans 25 years to recover fully, and the cost of rebuilding the city is predicted to be as high as $200 billion. The direct cost to the New York City economy following the September 11, 2001, terrorist attacks was between $80 billion and $100 billion. These figures do not include indirect costs or the incalculable human losses. Now just imagine the costs imposed by a ballistic missile nuclear strike against a U.S. city. The economic toll from a single nuclear attack against a major city, which would involve extensive decontamination activities and impact the national economy, could rise above $4 trillion.7 The economy could also be devastated by the electromagnetic pulse generated by a high-altitude nuclear explosion. The resulting electromagnetic shock would fry transformers within regional electrical power grids.8 The interdependent telecommunications (including computers), transportation, and banking and financial infrastructures that people and businesses rely on would be significantly damaged. Such an event would leave us, in some cases, with nineteenth-century technologies. **This situation could jeopardize the very viability of society and** the **survival** of the nation. Moreover, the paralysis leaders would experience would leave the country and its allies exposed to highly lethal twenty-first century threats. The blackmail possibilities of these weapons are as mind-numbing as they are terrifying.

EMP crushes commercial sats

Sirak 4 [Michael, JDW staff reporter, “US vulnerable to EMP attack,” 7/26, Jane’s, <http://www.janes.com/defence/news/jdw/jdw040726_1_n.shtml>]

An EMP attack, for example, could place the nation's electrical grid "in danger of fundamental collapse", said commission chairman William Graham, who served as scientific advisor to US President Ronald Reagan in the 1980s. The overall effects could be long lasting and difficult to recover from, he added. An EMP strike would also be likely to knock out non-hardened satellites in low-Earth orbit "within days or weeks", he said, noting that commercial satellites are especially vulnerable.

Commercial satellite transparency solves extinction

Wright – ’01, Editor @ Slate, Time, and the New Republic

Donald Rumsfeld, Space Cowboy, Wednesday, May 16, 2001, <http://www.slate.com/id/106180/>

People sometimes call outer space a "sanctuary," referring to the absence, thus far, of weapons in space. (Brookings Institution analyst Michael E. O'Hanlon used this very word in the New York Times article by James Dao that accurately described Rumsfeld's bureaucratic overhaul as a move to militarize space.) I don't generally go in for mushy, inspiring rhetoric, but I do think that in this case some uplifting imagery may be in order. The evolving web of surveillance satellites could come to constitute a precious, even sacred, celestial membrane that, by discouraging aggression in a nuclear age, saves the human species from itself.

Second, Brilliant Pebbles maintain space dominance and boost war-fighting capability

Kleinberg 7—Howard Kleinberg, MS in Security Studies and member of the graduate faculty of the Department of Public & International Affairs, “On War in Space”, August 2, 2007, Taylor and Francis, Volume 5, Issue 1, pg 1-27

Perhaps the greatest overlapping yet differentiating aspect of space is that space is the ultimate high ground. Space overarches all things Earthbound, even the skies themselves. Objects in space are not limited in operation by terrestrial conditions or locations. Space affords a terrestrial field of view that is superior to any Earth-bound site, one that can be increased by height. Space affords a wider and more instantaneous perspective than those to be obtained from any other medium, granting the means to link the world together wherever the terrestrial endpoints may be. 36 It might be argued that air warfare theory presents a theoretical basis that is too recent in its innovation and too immature to compare with those of land or sea. The latter two media have been contested for millennia and by many nations worldwide, presenting an abundance of data and observations from which both practical and theoretical insights have and can be gleaned. 37 By contrast, airpower has had less than a century in which to build and expand upon its theoretical and experiential foundations. 38 Nevertheless, air warfare has grown and garnered both experience and significance that it arguably dominates warfare today. 39 Space shares more parallels with air than it does with any other medium. From the foregoing analysis, it can be seen that while naval warfare theory has a great many critical aspects in common with those of space warfare, most of the attributes of space warfare actually find greater commonality with those of air warfare. Given these fundamental differences in the nature and paradigms of naval warfare compared with that of space, theories of naval warfare provide an inadequate basis upon which to formulate a space warfare theory. Instead, it is airpower that provides the best point from which to derive space warfare theory. Having established airpower theory as the basis from which to derive space warfare theory, a more detailed understanding of airpower theory is necessary. This is best obtained by examining the works of such past luminaries as Giulio Douhet, Billy Mitchell, and John Boyd, as well as the more contemporary work of Robert Pape and John Warden. 40 From this literature, one aspect of airpower is its ability to address not only the battlefield in all its breadth and depth, but all of the enemy's territories and assets. This ability to reach “an enemy's entire country” 41 is one that is shared with, and indeed exceeded, by space power projection. Another important aspect of airpower is the necessity to obtain and retain control of, i.e. to dominate, the air or space over the enemy's forces and territories, as well as to successfully defend the skies over one's own. While it may be argued that national airspace is more static than space itself, the counter is that space dominance is much like air dominance, wherein orbital velocities and reach are exploited to establish and retain control over any or all of Earth orbital space. The next important concept is that of COGs, referring to those things that are of the greatest value to the enemy, the threat or loss of which would cripple either warfighting ability or control of government and that can be targeted with airpower. COGs are an enemy's “military, economic, political, and psychological levers of power.” 42 The key to this lies in understanding what it is that constitutes an enemy's COGs—whether they are strengths or weaknesses, and how best to attack them. 43 These may be battlefield military targets themselves, as Pape recommends, 44 or they may be civilian and industrial infrastructure, as has been claimed for the successful air war over Kosovo. 45 The means to successful targeting lies in understanding the nature and structure of the enemy, what is valued, and how the enemy operates as a society and as a military system, to know what to target and determine the best means by which to defeat the enemy. Means and targets must also be driven by national policy and goals, ranging in effects from minor denial to total collapse of the state itself. 46 An optimal airpower strategy is one in which the enemy's COGs and LOCs are targeted with the primary intention of inducing strategic paralysis, of severing the bonds between these critical nodes, and rendering the enemy unable to operate or control the elements under attack. Elements and networks worth attacking include military, industrial, infrastructural, and sometimes personnel targets. Such notions were first posited by Mitchell, but articulated in far more detail by Boyd and Warden. 47 While “Clausewitzian” attrition can also be brought into play, the most efficient use of resources is most often found in paralysis, the disabling of an enemy's ability to see, maneuver, coordinate, and fight, to the point of inducing the enemy to retreat or surrender. 48 The key lies in understanding the enemy, what he values most, and how to target those most valued assets or connections for maximum effect in disarming, paralyzing, or disheartening the enemy. All of these concepts apply to space given the global nature of space. For former combat pilot, air combat instructor, and air war strategist Boyd, the solution to victory was to act more quickly, both mentally and physically, than one's opponent. Boyd expressed this concept in a cyclical process he called the “Observation-Orientation-Decision-Action (OODA) Loop.” 49 This principle could be applied not only to aerial combat, but to all types of warfighting. It is to this very process that space capabilities add enormous force- multiplier, time-reduction, and reaction-acceleration effects. Similarly, knowing what to target depends entirely upon the nature of the enemy faced in all its aspects, including the psychological and political as well as military. John Warden contends that this may be its leadership, at the center of the concentric layers of his “Five Rings” model, in which the structure of an enemy society consists of five rings, with its military forces constituting the outermost ring, and its leadership at the center. Kill the leadership, Worden contends, and the state's ability to fight collapses. 50 All of the aforementioned theories include the need for flexibility to adapt to changes in the enemy's behavior, as the latter can and will change with time over the course of any conflict. Direct combat can be conducted either by attacking the nodes themselves, or by attacking their LOCs. From this perspective, war in space can be conducted either by attacking the satellites or their links to each other, or their terrestrial nodes. Since these links are based on both their motion and electromagnetic communications, the former ties back to the satellites, while the latter can be affected either electromagnetically or via attacking their terrestrial nodes, primarily their data-link ground-stations. Since motion in space involves virtually unceasing motion and limited fuel, it then follows that physical combat in space would similarly be accomplished by “playing” with a vehicle's orbit, either by its striking its target directly after launch (a direct-ascent attack), or by “lurking” in a “parking” orbit, from **which it would await the command to move to attack its target, as exemplified by the proposed Brilliant Pebbles orbiting missile defense weapon system**. 51 Directed energy (DE) could change this aspect somewhat, but even so, the limited range and line-of-sight nature of DE would be constrained by having to wait for the DE platform to follow or alter its orbit to reach within striking distance of its intended target. Striking distance is almost a secondary factor, since orbital mechanics rule the motions, maneuvering, and resultant interactions of both spaceborne weapons and their spaceborne targets. Similarly, orbital mechanics limits the opportunities and distances at which space-based weapons can engage terrestrial targets (or vice-versa, for that matter.) Potential adversary states such as China, Russia, and Iran are fully cognizant of America's strengths in its space capabilities, which also constitute its equally critical strategic vulnerability in space, opening up a host of risks to the U.S. in the foreseeable future. As a result, U.S. vulnerabilities in space can and should be addressed to counter these threats, per airpower theory as well as doctrine. 52

Third, Space weapons enhance US tech superiority

Kleinberg 7—Howard Kleinberg, MS in Security Studies and member of the graduate faculty of the Department of Public & International Affairs, “On War in Space”, August 2, 2007, Taylor and Francis, Volume 5, Issue 1, pg 1-27

Current U.S. space-based capabilities represent just such a strategic advantage over potential adversaries. However, this very advantage also constitutes both a critical dependency and a strategic vulnerability, given its lack of physical defenses. Loss of these space-based capabilities would result in U.S. strategic paralysis, in both military and economic terms. To achieve the greatest possible warfighting advantage, a third and final key derivation from the proffered space warfare theory is that U.S. space weapons should include not just the capability to conduct combat operations in space, but should also incorporate “overwhelming” technological advantages over opposing space weapons technologies, such as was the case with terrestrial weaponry in Desert Storm. Technological advantage is particularly critical in space warfare, for it is only with technology that space presence can even be achieved, let alone contested. This offset strategy would add greatly to the likelihood of success in the event of a conflict in space. Further, and also in line with the technological-superiority strategy described by Carter, Letter, and Smith above, is that technologically-advanced space weapons systems could deter future potential adversaries from actually developing and deploying them, decreasing the odds that such a conflict in space would ever take place. In the best case scenario, this could lead to the dissuasion of current and future enemies from having their own space weapons programs. The next-best result would be the delay or downgrading of weapons systems deployed by enemies. Even in the worst case, the dislocating effects and resultant combat advantages of superior U.S. space forces could result in enemies' use of less-than-optimal strategies or commission of outright errors in conducting space combat operations. Of course, superior technology will likely prove decisive in any actual space combat engagements, provided that the advantage is sufficient to counter any asymmetric strategies that might be employed by a less capable space adversary. For instance, a space power with both full Space Situational Awareness and space-based, global-coverage-enabling missile defenses could effectively detect and thwart any attempt by a lesser power to employ asymmetric attacks such as a direct ascent anti-satellite weapon (ASAT) or High-Altitude Nuclear Detonation, as well as its intended missile defense mission. 60

Only hegemony can prevent conflicts from escalating to nuclear use

Robert Kagan 7, senior associate at the Carnegie Endowment for International Peace and senior transatlantic fellow at the German Marshall Fund, August/September 2007, The Hoover Policy Review, online: <http://www.hoover.org/publications/policyreview/8552512.html>, accessed August 17, 2007

The jostling for status and influence among these ambitious nations and would-be nations is a second defining feature of the new post-Cold War international system. Nationalism in all its forms is back, if it ever went away, and so is international competition for power, influence, honor, and status. American predominance prevents these rivalries from intensifying —  its regional as well as its global predominance. Were the United States to diminish its influence in the regions where it is currently the strongest power, the other nations would settle disputes as great and lesser powers have done in the past: sometimes through diplomacy and accommodation but often through confrontation and wars of varying scope, intensity, and destructiveness. One novel aspect of such a multipolar world is that most of **these powers would possess nuclear weapons.** That could make wars between them less likely, or it could simply make them **more catastrophic.**

Independently, China is rising and will attack US space assets—absent weaponization it will claim Taiwan and East Asian hegemony

**Tellis 7**—Ashley Tellis, PhD and senior associate at the Carnegie Endowment for International Peace, specializing in international security, defense, and Asian strategic issues, July 23, 2007, “China's Space Weapons” Carnegie Endowment for International Peace, online: http://www.carnegieendowment.org/2007/07/23/china-s-space-weapons/v52

On Jan. 11, 2007, a Chinese medium-range ballistic missile slammed into an aging weather satellite in space. The resulting collision not only marked Beijing's first successful anti-satellite (ASAT) test but, in the eyes of many, also a head-on collision with the Bush administration's space policies. As one analyst phrased it, U.S. policy has compelled China's leaders to conclude "that only a display of Beijing's power to launch . . . an arms race would bring Washington to the table to hear their concerns." This view, which is widespread in the U.S. and elsewhere, misses the point: **China's ASAT demonstration** **was** not a protest against the Bush administration, but rather **part of a maturing strategy designed to counter the overall military superiority of the U.S.** Since the end of the Cold War, Chinese strategists have been cognizant of the fact that the U.S. is the only country in the world with the capacity -- and possibly the intention -- to thwart China's rise to great power status. They also recognize that **Beijing will** be weak militarily for some time to come, yet must **be prepared for a possible war with America over Taiwan or**, in the longer term, over what Aaron Friedberg once called "**the struggle for mastery in Asia**." How the weaker can defeat the stronger, therefore, becomes the central problem facing China's military strategy. Chinese strategists have struggled to find ways of solving this conundrum ever since the dramatic demonstration of American prowess in Operation Desert Storm. And after carefully analyzing U.S. operations in the Persian Gulf, Kosovo and Afghanistan, they believe they have uncovered a significant weakness. The advanced military might of the U.S. is inordinately dependent on a complex network of space-based command, control, communications, and computer-driven intelligence, surveillance and reconnaissance capabilities that enables American forces to detect different kinds of targets and exchange militarily relevant information. This network is key to the success of American combat operations. These assets, however, are soft and defenseless; while they bestow on the American military definite asymmetric advantages, they are also the source of deep vulnerability. Consequently, **Chinese strategists concluded that any effort** **to defeat the U.S. should aim** not at its fundamental strength -- its capacity to deliver overwhelming conventional firepower precisely from long distances -- but rather **at its Achilles' heel, namely, its satellites and their related ground installations.** Consistent with this calculus, China has pursued, for over a decade now, a variety of space warfare programs, which include direct attack and directed-energy weapons, electronic attack, and computer-network and ground-attack systems. These efforts are aimed at giving China the capacity to attack U.S. space systems comprehensively because, in Chinese calculations, this represents the best way of "leveling the playing field" in the event of a future conflict. The importance of space denial for China's operational success implies that its counterspace investments, far from being bargaining chips aimed at creating a peaceful space regime, in fact represent its best hope for prevailing against superior American military power. Because having this capacity is critical to Chinese security, Beijing will not entertain any arms-control regime that requires it to trade away its space-denial capabilities. This would only further accentuate the military advantages of its competitors. For China to do otherwise would be to condemn its armed forces to inevitable defeat in any encounter with American power. This is why arms-control advocates are wrong even when they are right. Any "weaponization" of space will indeed be costly and especially dangerous to the U.S., which relies heavily on space for military superiority, economic growth and strategic stability. Space arms-control advocates are correct when they emphasize that advanced powers stand to gain disproportionately from any global regime that protects their space assets. Yet they are wrong when they insist that such a regime is attainable and, therefore, ought to be pursued. Weaker but significant challengers, like China, simply cannot permit the creation of such a space sanctuary because of its deleterious consequences for their particular interests. Consequently, even though a treaty protecting space assets would be beneficial to Washington, its specific costs to Beijing -- in the context of executing China's national military strategy -- would be remarkably high. Beijing's attitude toward space arms control will change only given a few particular developments. China might acquire the capacity to defeat the U.S. despite America's privileged access to space. Or China's investments in counterspace technology might begin to yield diminishing returns because the U.S. consistently nullifies these capabilities through superior technology and operational practices. Or China's own dependence on space for strategic and economic reasons might intensify to the point where the threat posed by any American offensive counterspace programs exceed the benefits accruing to Beijing's own comparable efforts. Or the risk of conflict between a weaker China and any other superior military power, such as the U.S., disappears entirely. Since these conditions will not be realized anytime soon, Washington should certainly discuss space security with Beijing**, but**, for now**, it should not expect that negotiation will yield any successful agreements**. Instead, **the U.S. should accelerate investments in solutions that enhance the security of its space assets, in addition to developing its own offensive counterspace** **capabilities. These avenues** -- as the Bush administration has correctly recognized -- **offer the promise of protecting American interests in space and averting more serious threats to its global primacy.**

The impact is global nuclear war and extinction

STRAITS TIMES, 2K [“No One Gains in War over Taiwan,” 6/25/00, Lexis]

THE high-intensity scenario postulates a cross-strait war escalating into a full-scale war between the US and China. If Washington were to conclude that splitting China would better serve its national interests, then a full-scale war becomes unavoidable. Conflict on such a scale would embroil other countries far and near and -horror of horrors -raise the possibility of a nuclear war. Beijing has already told the US and Japan privately that it considers any country providing bases and logistics support to any US forces attacking China as belligerent parties open to its retaliation. In the region, this means South Korea, Japan, the Philippines and, to a lesser extent, Singapore. If China were to retaliate, east Asia will be set on fire. And the conflagration may not end there as opportunistic powers elsewhere may try to overturn the existing world order. With the US distracted, Russia may seek to redefine Europe's political landscape. The balance of power in the Middle East may be similarly upset by the likes of Iraq. In south Asia, hostilities between India and Pakistan, each armed with its own nuclear arsenal, could enter a new and dangerous phase. Will a full-scale Sino-US war lead to a nuclear war? According to General Matthew Ridgeway, commander of the US Eighth Army which fought against the Chinese in the Korean War, the US had at the time thought of using nuclear weapons against China to save the US from military defeat. In his book The Korean War, a personal account of the military and political aspects of the conflict and its implications on future US foreign policy, Gen Ridgeway said that US was confronted with two choices in Korea -truce or a broadened war, which could have led to the use of nuclear weapons. If the US had to resort to nuclear weaponry to defeat China long before the latter acquired a similar capability, there is little hope of winning a war against China 50 years later, short of using nuclear weapons. The US estimates that China possesses about 20 nuclear warheads that can destroy major American cities. Beijing also seems prepared to go for the nuclear option. A Chinese military officer disclosed recently that Beijing was considering a review of its "non first use" principle regarding nuclear weapons. Major-General Pan Zhangqiang, president of the military-funded Institute for Strategic Studies, told a gathering at the Woodrow Wilson International Centre for Scholars in Washington that although the government still abided by that principle, there were strong pressures from the military to drop it. He said military leaders considered the use of nuclear weapons mandatory if the country risked dismemberment as a result of foreign intervention. Gen Ridgeway said that should that come to pass, we would see the destruction of civilisation. There would be no victors in such a war. While the prospect of a nuclear Armaggedon over Taiwan might seem inconceivable, it cannot be ruled out entirely, for China puts sovereignty above everything else.

## Scenario 2 is Missile Defense---

Rogue states are gaining Missiles in the status quo

A. North Korea

Bolton 7-14-11 – John R. Bolton, a former U.S. ambassador to the United Nations, is a senior fellow at the American Enterprise Institute, “North Korea edges toward next nuke test,” http://www.washingtontimes.com/news/2011/jul/14/north-korea-edges-toward-next-nuke-test/

You wouldn’t know it from the Obama administration, but North Korea’s global threat continues to metastasize. South Korea recently concluded that extensive cyber-attacks against civilian and military targets in the South emanated from the Democratic People’s Republic of Korea (DPRK). Following China’s lead in information warfare, the North is creating yet another asymmetric military capability it can deploy against its adversaries and also peddle for hard currency to other rogue states and terrorists. Although Pyongyang limited its targeting of this particular sortie to South Korea, the potential cyberwarfare battlefield is global and includes the United States, which already is the subject of extensive cyberprobing, exploitation and espionage by China. For a country perennially on the brink of starvation, North Korea’s military foray into cyberspace demonstrates its continuing malevolence. The DPRK’s nuclear-weapons program has not rested on its laurels, either, with widely observed surface-level preparations for a possible third underground test well under way. The North’s development of ballistic missiles capable of delivering nuclear payloads is also advancing apace, as Russian missile designer Yuri Solomonov highlighted last month in a Kommersant interview. This is hardly surprisingly given Iran’s increasing long-range capabilities, the extensive Tehran-Pyongyang collaboration, and their programs’ common base in Soviet-era Scud missile technology. Meanwhile, Pakistan’s A.Q. Khan has released documents purportedly showing prior North Korean bribery of senior Islamabad officials to grease the transfer of nuclear or ballistic-missile technology. While their authenticity is disputed, the documents are part of Mr. Khan’s continuing campaign to prove he did not act solo in the world’s illicit nuclear-weapons bazaar. He long ago admitted supplying North Korea and Iran with critical nuclear technology. Pyongyang’s unveiling in November of impressive new uranium-enrichment facilities at Yongbyon and recent construction there show the continuing fruits of Mr. Khan’s entrepreneurship. His documents - and the many others he undoubtedly has in a shoebox somewhere - are worth verifying and actually might help Islamabad and Washington work together to repair their fractured relationship and prevent China from exploiting their current differences. Clearly, North Korea’s weapons programs are not decelerating even amid intensive preparations for a possible transition of power, following Kim Jong-il’s death, to a third member of the communist Kim dynasty. But faced with these challenges, the Obama administration has been not only publicly silent but essentially passive both diplomatically and intellectually. Only the Pentagon and the intelligence community, fortunately still implementing the Proliferation Security Initiative, have done much beyond noting pro forma that the troublemaking DPRK is still at it.

B. Iran

**DAREINI 6-2-11** – Ali Akbar Dareini, Associate Press writer, “Iran: Missile progress shows sanctions futile,” http://news.yahoo.com/iran-missile-progress-shows-sanctions-futile-162422024.html

Iran's defense minister claimed Saturday that the country's missile progress shows that U.N. sanctions are ineffective and won't stop Tehran's defense programs. The statement by Gen. Ahmad Vahidi comes during 10 days of war games in Iran's latest show of military might and displays what Tehran claims is growing self-sufficiency in military and other technologies. Vahidi said Iran's missile program is "indigenous" and has no reliance on foreign countries to meet its defense requirements. Iran is under four sets of U.N. sanctions over its refusal to halt uranium enrichment, a technology that can be used to produce nuclear fuel or atomic weapons. Last week, Iran unveiled underground missile silos for the first time, making Iran's arsenal less vulnerable to any possible attack. Iran's Revolutionary Guard, the country's most powerful military force, said the Islamic Republic has the ability to produce missiles with a greater range than those currently in its arsenal, but doesn't need to do so. The upgraded version of Iran's Shahab-3 and Sajjil-2 missiles already can travel up to 1,240 miles (2,000 kilometers) — putting Israel, U.S. bases in the Gulf region and parts Europe within reach. "The war games ... show Iran's great capability in designing, producing and using various kinds of missiles based on domestic knowledge. This showed that the sanctions imposed had no effect on Iran's missile program," Vahidi said in comments posted on sepahnews.com, the Guard's official website. Iran has periodically boasted of what it calls homegrown advances in technological sectors such as its satellite program and other scientific work.

**Ballistic missile prolif causes regional instability and asymmetric WMD use in important regions**

Roberto L. **Delgado 5**, Colonel - United States Army, “WHAT SHOULD BE THE UNITED STATES POLICY TOWARDS BALLISTIC MISSILE DEFENSE FOR NORTHEAST ASIA?”, U.S. Army War College, 3-18, http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA431775&Location=U2&doc=GetTRDoc.pdf

The proliferation of weapons of mass destruction (WMD) by rogue nations is an issue that jeopardizes the security of our nation, people, deployed military forces, friends, and allies. Since the collapse of the former Soviet Union, the world has become more unpredictable and volatile rather than predictable and peaceful. The instability in some countries and regions of the world has increased the interest of insurgents and extremists in obtaining WMD and the means to deliver them, including ballistic missiles, in order to coerce or topple the governments within their countries. To many nations and countries, ballistic missiles are an inexpensive and effective means to overcome an adversary’s air defense system without having to use manned aircraft, lose trained personnel, and damage costly aircrafts. Missiles also require less maintenance, training, and logistics than manned aircraft. Ballistic and cruise missiles can also be armed with conventional or non-conventional warheads; even the limited use of these weapons could be devastating to any country or nation and their people. The United States, as the only global power, is a prime target for these players as they seek to destabilize the United States and its interests abroad through either the employment or threat of employment of WMD. Ballistic missiles, with the capability to deliver nuclear, biological, and chemical war heads cause significant anxiety in the United States and abroad.

**Causes fast escalation in the Middle East, South and East Asia**

**Levinger 6** – Josh Levinger, Research Assistant with the Center for Future Civic Media at MIT, Fall 2006, “Ballistic Missile Proliferation Among the “Axis of Evil”: Iran, Iraq, North Korea and Pakistan,” http://www.levinger.net/josh/files/range/paper.pdf

The real threat posed by ballistic missile proliferation is to regional stability. Intro- ducing long range missiles and nuclear warheads into inflamed regions such as the Middle East, the Indian subcontinent, and East Asia, opens the possibility for accidental launch and rapid escalation. While the United States and the Soviet Union stared each other down at the nuclear threshold for decades, other adversaries may not have as ad- vanced a military decision process, or the experience of living with the threat of total an- nihilation. The future of missile proliferation looks bleak, with the impending disintegra- tion of the NPT and the circumvention of the MTCR. On the other hand, the foreign market for budding missile designers appears to be booming. Perhaps there are job of- fers waiting for this graduating senior in Pyongyang, Tehran or Islamabad.

**Causes superpower nuclear war in Asia**

**Stares and Wit ‘9**, Sr. Fellow for Conflict Prevention at the C.F.R. & Adjunct Sr. Research Fellow @ Weatherhead East Asia Institute, Columbia University, 2009 (Paul and Joel, “Preparing for Sudden Change in North Korea,” January, available for download athttp://www.cfr.org/

These various scenarios would present the United States and the neighboring states with challenges and dilemmas that, depending on how events were to unfold, could grow in size and complexity. Important and vital interests are at stake for all concerned. North Korea is hardly a normal country located in a strategic backwater of the world. As a nuclear weapons state and exporter of ballistic missile systems, it has long been a serious proliferation concern to Washington. With one of the world’s largest armies in possession of huge numbers of long-range artillery and missiles, it can also wreak havoc on America’s most impor- tant Asian allies––South Korea and Japan––both of which are home to large numbers of American citizens and host to major U.S. garrisons committed to their defense. Moreover, North Korea abuts two great powers—China and Russia––that have important interests at stake in the future of the peninsula. That they would become actively engaged in any future crisis involving North Korea is virtually guaranteed. Although all the interested powers share a basic interest in maintain- ing peace and stability in northeast Asia, a major crisis from within North Korea could lead to significant tensions and––as in the past–– even conflict between them. A contested or prolonged leadership strug- gle in Pyongyang would inevitably raise questions in Washington about whether the United States should try to sway the outcome.5 Some will almost certainly argue that only by promoting regime change will the threat now posed by North Korea as a global proliferator, as a regional menace to America’s allies, and as a massive human rights violator, finally disappear. Such views could gain some currency in Seoul and even Tokyo, though it seems unlikely. Beijing, however, would certainly look on any attempt to promote a pro-American regime in Pyongyang as interference in the internal affairs of a sovereign state and a challenge to China’s national interests. This and other potential sources of friction could intensify should the situation in North Korea deteriorate. The impact of a severe power struggle in Pyongyang on the availability of food and other basic ser- vices could cause tens and possibly hundreds of thousands of refugees to flee North Korea. The pressure on neighboring countries to intervene with humanitarian assistance and use their military to stem the flow of refugees would likely grow in these circumstances. Suspicions that the situation could be exploited by others for political advantage would add to the pressure to act sooner rather than later in a crisis. China would be the most likely destination for refugees because of its relatively open and porous border; its People’s Liberation Army (PLA) has reportedly developed contingency plans to intervene in North Korea for possible humanitarian, peacekeeping, and “environmental control” missions.6 Besides increasing the risk of dangerous military interactions and unin- tended escalation in sensitive borders areas, China’s actions would likely cause considerable consternation in South Korea about its ultimate intentions toward the peninsula. China no doubt harbors similar fears about potential South Korean and American intervention in the North.

**And the Middle East**

Alon **Ben-Meir 7** professor of international relations at the Center for Global Affairs at NYU, 2/6/07, Realpolitik: Ending Iran's defiance, http://www.upi.com/Security\_Industry/2007/02/06/Realpolitik-Ending-Irans-defiance/UPI-69491170778058/

Feeling emboldened and unrestrained, Tehran may, however, miscalculate the consequences of its own actions, which could precipitate a catastrophic regional war. The Bush administration has less than a year to rein in Iran's reckless behavior if it hopes to prevent such an ominous outcome and achieve, at least, a modicum of regional stability. By all assessments, Iran has reaped the greatest benefits from the Iraq war. The war's consequences and the American preoccupation with it have provided Iran with an historic opportunity to establish Shiite dominance in the region while aggressively pursuing a nuclear weapon program to deter any challenge to its strategy. Tehran is fully cognizant that the successful pursuit of its regional hegemony has now become intertwined with the clout that a nuclear program bestows. Therefore, it is most unlikely that Iran will give up its nuclear ambitions at this juncture, unless it concludes that the price will be too high to bear. That is, whereas before the Iraq war Washington could deal with Iran's nuclear program by itself, now the Bush administration must also disabuse Iran of the belief that it can achieve its regional objectives with impunity. Thus, while the administration attempts to stem the Sunni-Shiite violence in Iraq to prevent it from engulfing other states in the region, Washington must also take a clear stand in Lebanon. Under no circumstances should Iranian-backed Hezbollah be allowed to topple the secular Lebanese government. If this were to occur, it would trigger not only a devastating civil war in Lebanon but a wider Sunni-Shiite bloody conflict. The Arab Sunni states, especially, Saudi Arabia, Egypt and Jordan, are terrified of this possible outcome. For them Lebanon may well provide the litmus test of the administration's resolve to inhibit Tehran's adventurism but they must be prepared to directly support U.S. efforts. In this regard, the Bush administration must wean Syria from Iran. This move is of paramount importance because not only could Syria end its political and logistical support for Hezbollah, but it could return Syria, which is predominantly Sunni, to the Arab-Sunni fold. President Bush must realize that Damascus' strategic interests are not compatible with Tehran's and the Assad regime knows only too well its future political stability and economic prosperity depends on peace with Israel and normal relations with the United States. President Bashar Assad may talk tough and embrace militancy as a policy tool; he is, however, the same president who called, more than once, for unconditional resumption of peace negotiation with Israel and was rebuffed. The stakes for the United States and its allies in the region are too high to preclude testing Syria's real intentions which can be ascertained only through direct talks. It is high time for the administration to reassess its policy toward Syria and begin by abandoning its schemes of regime change in Damascus. Syria simply matters; the administration must end its efforts to marginalize a country that can play such a pivotal role in changing the political dynamic for the better throughout the region. Although ideally direct negotiations between the United States and Iran should be the first resort to resolve the nuclear issue, as long as Tehran does not feel seriously threatened, it seems unlikely that the clergy will at this stage end the nuclear program. In possession of nuclear weapons Iran will intimidate the larger Sunni Arab states in the region, bully smaller states into submission, threaten Israel's very existence, use oil as a political weapon to blackmail the West and instigate regional proliferation of nuclear weapons' programs. In short, if unchecked, Iran could plunge the Middle East into a deliberate or inadvertent nuclear conflagration. If we take the administration at its word that it would not tolerate a nuclear Iran and considering these regional implications, Washington is left with no choice but to warn Iran of the severe consequences of not halting its nuclear program.

**Indo-Pak war causes nuclear Armageddon**

Praful **Bidwai 8**, International The News, 12-26-08, http://www.thenews.com.pk/print1.asp?id=153861

Any India-Pakistan conflict is liable to escalate into nuclear war. In Nuclear Armageddon, there are no winners—only mega-deaths. Even a limited nuclear exchange will kill millions of civilians in both countries. The economic and environmental damage will set us back by decades. A single Hiroshima/Nagasaki-type bomb will kill 8 to 20 lakh people in a big city. India and Pakistan both have scores of such bombs, indeed even more powerful ones. In every conceivable war-gaming scenario—and many credible ones exist —, an India-Pakistan conflict has one inevitable outcome: full-scale war, in which Pakistan won’t hesitate to use nuclear weapons if it fears loss of territory. This will invite nuclear retaliation from India, with consequences too horrifying even to contemplate.

Even small threats pose great risk

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Misile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Twenty-first century threats to the United States, its de- ployed forces, and its friends and allies differ fundamental- ly from those of the Cold War. An unprecedented number of international actors have now acquired – or are seeking to acquire – missiles. These include not only states, but also non-state groups interested in obtaining missiles with nucle- ar or other payloads. The spectrum encompasses the missile arsenals already in the hands of Russia and China, as well as the emerging arsenals of a number of hostile states.

The character of this threat has also changed. Unlike the Soviet Union, these newer missile possessors do not attempt to match U.S. systems, either in quality or in quantity. In- stead, their missiles are designed to inflict major devasta- tion without necessarily possessing the accuracy associated with the U.S. and Soviet nuclear arsenals of the Cold War.1

The warning time that the United States might have be- fore the deployment of such capabilities by a hostile state, or even a terrorist actor, is eroding as a result of several fac- tors, including the continued proliferation and widespread availability of technologies to build missiles and the result- ing possibility that an entire system might be purchased out- right. Would-be possessors do not have to engage in the pro- tracted process of designing and building a missile. They could purchase and assemble components, reverse-engineer a missile after having purchased a prototype, or immediately acquire a number of assembled missiles. Even missiles that are primitive by U.S. standards might suffice for a rogue state or terrorist organization seeking to inflict extensive damage upon the United States. As the Rumsfeld Commission point- ed out in its 1998 report:

Under some plausible scenarios – including re-bas- ing or transfer of operational missiles, sea- and air- launch options, and shortened development pro- grams that might include testing in a third country – or some combination of these – the United States might well have little or no warning before opera- tional deployment.2

SMD deters threats because of its layered capabilities

Pfaltzgraff 8 – Dr. Robert L. Pfaltzgraff jr., President, the Institute for Foreign Policy Analysis and Shelby Cullom Davis Professor of International Security Studies, The Fletcher School of Law and Diplomacy, Tufts University, December 15, 2008, “Space And U.S. Security A Net Assessment,” The Institute for Foreign Policy Analysis,http://www.ifpa.org/pdf/Space\_and\_U\_S\_Security\_Net\_Assessment\_Final\_Dec15\_08.pdf

The proliferation of ballistic missiles and weapons of mass destruction (WMD) and their possession by grow- ing numbers of adversaries, ranging from traditional strategic competitors to terrorist organizations, pose a serious and growing threat to the United States, its civilian population and deployed military forces, and friends and allies. This threat encompasses:

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States such as North Korea and Iran which are working hard to acquire (or already possess) WMD and the means to deliver them;

Strategic competitors, Russia and China, which are extending the sophistication of their strategic arsenals in terms of warhead accuracy, countermeasures, and delivery systems;

Terrorist groups, which are making concerted efforts to obtain WMD that would enable them to conduct chemical, biological, radiological, or nuclear attacks; and

Threats are increasing at a pace that may not give the United States the luxury of lengthy timelines to develop and deploy a missile defense against them. A global layered defense capability is necessary to counter these threats. Near-term options exist for developing viable space-based defenses within the next decade resulting in a comprehensive, global layered missile defense system. This option would complement the system currently being deployed but afford superior coverage at less cost than expanding the number of GMD sites beyond those already planned in the United States and in Europe. Layered defenses provide multiple opportunities to destroy attacking missiles in all three phases of flight from any direction regardless of their geographic starting point. Furthermore, a layered defense makes the countermeasures available to the offensive systems much less effective than would be the case if interdiction was only possible in one (or two) phase(s) of the missile’s flight. Boost phase intercepts, most efficiently conducted by components deployed in space, are particularly desirable because a missile is most vulnerable during this segment since it is relatively slow moving, presents a readily identifiable target (bright rocket plume), and has not released any of its warheads or countermeasures which would complicate interception in subsequent phases. Boost phase interception has the added advantage that the missile’s payload may, depending on how early interdiction occurs, fall back on the attacking nation. This situation could deter the launching state if it is confronted with the likelihood of serious damage to its own territory. In addition, depending on the number of assets deployed, a space-based boost-phase defense could always be on station on a world-wide basis, unfettered by sovereignty issues of overflight and operations on another nation’s territory.

## Scenario 3 is Weaponization---

Weaponization is inevitable

Sheldon and Gray 7/7/11—John Sheldon is a PhD and Marshall Institute Fellow, and a visiting professor at the School of Advanced Air and Space Studies, Colin Gray is a PhD and Professor of International Politics and Director of the Centre for Security Studies, “Theory Ascendant? Spacepower and the Challenge of Strategic Theory” NDU Press, online: http://www.ndu.edu/press/space-Ch15.html

"Technological competence is required to become a space power, and conversely, technological benefits are derived from being a space power."31 As space technologies disseminate throughout the world at a rapid pace, Oberg reminds us that true spacepower is that which can be organically sustained rather than purchased on the open market. It may prove critical to be able to develop, manufacture, launch, and operate one's own space-power without having to rely upon a third party for technological expertise. Technological competence in this area undoubtedly will have strategic benefits as well as economic ones. "As with the earth-bound media [land, sea, and air], **the weaponization of space is inevitable**, though the manner and timing are not at all predictable."32 Because spacepower is not beyond strategy, so it is not beyond the fate that has befallen every other environment that humankind has exploited. We may debate the desirability of space weaponization as a policy option in the near and mid-term, and, indeed, what that may or may not look like, **but weaponization in one form or another will happen.** "Situational awareness in space is a key to successful application of space power."33 Space situational awareness at present is sketchy at best, and yet it is required in order to carry out many of the simplest and most mundane spacepower functions, as well as to be able to distinguish between natural hazards and intentional threats or interference. "Control of space is the linchpin upon which a nation's space power depends."34 In fact, Oberg does not reach far enough here. Because terrestrially based armed forces have become so space-dependent, the control of space will become critically important for a nation's land, air-, and seapower, not just spacepower.

SMD signals the perception of US heg and prevents further weaponization

**Dolman 10**- Everett Dolman, PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies, September 2010, “The Case for Weapons in Space: A Geopolitical Assessment” APSA Annual Meeting, pg 30

This reasoning does not dispute the fact that US deployment of weapons in outer space would represent the addition of a potent new military capacity, one that would assist in extending the current period of American hegemony well into the future. Clearly this would be intimidating, and America must expect severe condemnation and increased competition in peripheral areas. But such an outcome is less threatening than another, particularly non-liberal authoritarian state doing so, as the necessity of a response in kind is compelling. **Placement of weapons in space by the U**nited **S**tates **would be perceived** correctly **as an attempt at continuing American hegemony**. Although there is obvious opposition to the current international balance of power, the majority of states seem to regard it as at least tolerable. A continuation of the status quo is thus minimally acceptable, even to states working toward its demise. As long as the United States does not employ its power arbitrarily, the situation would be bearable initially and grudgingly accepted over time. Mirror-imaging does not apply here. An attempt by China to dominate space would be part of an effort to break the land-sea-air dominance of the United States in preparation for a new international order. Such an action would challenge the status quo, rather than seek to perpetuate it. This would be disconcerting to nations that accept, no matter how grudgingly, the current international order—including the venerable institutions of trade, finance, and law that operate within it—and intolerable to the United States. As leader of the current system, the United States could do no less than engage in a perhaps ruinous space arms race, save graciously decide to step aside and accept a diminished world status. **Seizing the initiative and securing** low-Earth **orbit now, while the U**nited **S**tates **is dominant in space infrastructure, would do** **much to stabilize the international system and prevent an arms race in space**. The enhanced ability to deny any attempt by another nation to place military assets in space and to readily engage and destroy terrestrial anti-satellite capacity would make the possibility of large-scale space war or military space races less likely, not more. Why would a state expend the effort to compete in space with a superpower that has the extraordinary advantage of holding securely the highest ground at the top of the gravity well? So long as the controlling state demonstrates a capacity and a will to use force to defend its position, in effect expending a small amount of violence as needed to prevent a greater conflagration in the future, the likelihood of a future war in space is remote. Moreover, if the United States were willing to deploy and use a military space force that maintained effective control of space, and did so in a way that was perceived as tough, non-arbitrary, and efficient, such an action would serve to discourage competing states from fielding opposing systems. It could also set the stage for a new space regime, one that encourages space commerce and development. Should the United States use its advantage to police the heavens and allow unhindered peaceful use of space by any and all nations for economic and scientific development, over time its control of LEO could be viewed as a global public good. In much the same way the British maintained control of the high seas in the nineteenth century, enforcing international norms of innocent passage and property rights, and against slavery, the US could prepare outer space for a long-overdue burst of economic expansion.

Insert Weaponization Impacts

Current satellites face too many limitations to solve

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

Political, strategic, and technological uncertainties could change the missile defense scenario by causing a shift in the threat from one region to another. Given that it takes years to field, test, and make operational new fixed interceptor and sensor sites, a shift in the threat could leave the nation vulnerable. Because many of the interceptors and sensors in the current system are fixed to geographic points, we are limited in our ability to defend the homeland, for example, against missiles launched from surprise locations such as a ship off our shoreline. We also might face an adversary tomorrow that deploys tens or even hundreds of ballistic missiles or one that has more sophisticated countermeasure and reentry technologies. Those, too, would be expected to stress the current system, which is designed at the moment to deal with more limited threats.Planned transportable land-based and mobile sea-based and airborne systems also suffer limitations. The need to base sensors and interceptors forward, closer to threat launch sites, in order to enlarge the engagement battle space makes our security dependent on political decisions by foreign governments. Projected boost defense systems, which may be deployed to the periphery or littoral of an adversary, would have very limited or no utility against a ballistic missile launched from several hundred miles inside a threat country's border. The inability to engage a missile in boost means we would be left with only midcourse or terminal intercept possibilities, if those are available, and this removes a layer from the effectiveness calculations.

Space based assets are key—maintains flexibility and precision

Lambakis 7—Steven Lambakis, senior analyst in spacepower and policy studies at the National Institute for Public Policy, February 1, 2007, “Missile Defense From Space” Hoover Institution, Policy Review No. 141, online: http://www.hoover.org/publications/policy-review/article/6124

Terrestrial-based weapons that engage in space, in the middle or midcourse of a missile’s or warhead’s flight, offer perhaps the greatest flexibility in terms of addressing possible flight azimuths, trajectories, and launch points. While ground-based midcourse interceptors may have to be oriented to large threat regions, they can defend against multiple launch points. Conversely, ground interceptors that are near the target can defend only a small area, but they can potentially protect that point from launches anywhere in the world. Yet it is simply unaffordable to do a point defense for every place you want to defend in the United States, every place that U.S. forces go, or everywhere that our allies are. The ability to do area defense — to defend against multiple launch points as opposed to doing point defense of a very limited area — is fundamental to successful missile defense. Political, strategic, and technological uncertainties could change the missile defense scenario by causing a shift in the threat from one region to another. Given that it takes years to field, test, and make operational new fixed interceptor and sensor sites, a shift in the threat could leave the nation vulnerable. Because many of the interceptors and sensors in the current system are fixed to geographic points, we are limited in our ability to defend the homeland, for example, against missiles launched from surprise locations such as a ship off our shoreline. We also might face an adversary tomorrow that deploys tens or even hundreds of ballistic missiles or one that has more sophisticated countermeasure and reentry technologies. Those, too, would be expected to stress the current system, which is designed at the moment to deal with more limited threats. Planned transportable land-based and mobile sea-based and airborne systems also suffer limitations. The need to base sensors and interceptors forward, closer to threat launch sites, in order to enlarge the engagement battle space makes our security dependent on political decisions by foreign governments. Projected boost defense systems, which may be deployed to the periphery or littoral of an adversary, would have very limited or no utility against a ballistic missile launched from several hundred miles inside a threat country’s border. The inability to engage a missile in boost means we would be left with only midcourse or terminal intercept possibilities, if those are available, and this removes a layer from the effectiveness calculations.

\*\*\*1AC Tech\*\*\*

## ADVANTAGE \_\_ : TECHNOLOGY

### A. EXPLORATION

No political will for space colonization now due to lack of tech

Falconer, 6/26- Joel Falconer is the Australian Editor at TNW. Having worked at various Australian startups and founded a content marketing business, 6/26/11 “What Would Colonization of the Final Frontier Look Like?”, http://thenextweb.com/insider/2011/06/26/what-would-colonization-of-the-final-frontier-look-like/

Space colonization is something that people have dreamed about since the moon landing, and is in fact considered a priority for the future of mankind by leading scientists. Unfortunately, we’ve all but ignored space colonization and the development of its technologies in recent decades, though there have been a myriad of developments that weren’t intended to advance the cause that will do just that. Aerospace advances, submarines that humans can survive in for months at a time autonomously and experiments like the Biodome have all led to uncovering pieces of the puzzle. It’s not a huge surprise that governments and corporations aren’t investing heavily in space colonization itself. We still need to make many, many more of these ancillary but important advances before we’d make any significant progress in the area. And there’s that other issue – that governments and corporations don’t see a need to ramp up the timeline on this. But Stephen Hawking, one of the few physicists whose name regular people actually know, thinks differently. He’s worried that until we disperse, we’re in imminent danger of a catastrophic event destroying human civilization – heck, human life – for good. “One we spread out into space and establish colonies, our future should be safe,” Hawking once said to a BBC reporter. There’s much to consider, and the question of where we should colonize isn’t even chief among them yet. Let’s skip the boring stuff for the moment, though, and start there.

Government deployment of SMD encourages private sector investment --- creates momentum for space exploration

Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 44-45

Space has become an essential part of daily life. This includes satellites that transmit television images, provide weather forecasting data, emergency response, the infrastructure for the internet, the mapping of the Earth’s surface, and global positioning information. Space technologies are transforming the process by which we conduct business and undertake research. The net result is greater productivity with important implications for economic growth, prosperity, and innovation. Access to space-based assets is essential for a broad range of private-sector activities, which will increase both in scope and intensity as a result of the emergence of technologies including smaller satellites and cheaper boosters, miniaturization, and greater economies of scale. The space infrastructure originally established with government funding has furnished the basis for both military and commercial applications. In the years ahead, the commercial sector is likely to provide innovative impetus that spills over into the military arena.

By the mid-1990s, global commercial revenues from space resulting from the rapid expansion of consumer services such as telecommunications and television were greater than the aggregate of government spending on space. In 2007 alone, spending on commercial space infrastructure, infrastructure support industries, and commercial satellite services (including direct-to-home television and GPS) totaled approximately $174 billion, accounting for nearly 70 percent of total global space spending. Alongside increased commercial spending on space, government space budgets have accounted for a steadily decreasing percentage of global space spending. In the past two years alone, the governmental share of global space spending has slipped by 8 percentage points, from 39 percent of global space spending in 2005 to 31 percent in 2007. Over the same period of time, aggregate government spending on space actually increased by $8.25 billion. The fact that government’s share of space spending decreased 8 points in spite of a 12 percent boost in spending further underscores the impressive growth of the commercial space sector.36

SMD creates tech spillovers --- enhances overall US tech leadership

Schaffer 03- Bob, former U.S. Senator and Congressman from Colorado former vice chairman of the senate education committee, 10/15/2003, “US Needs Space-Based Missile Defense”, Vital Speeches of the Day Vol. 70, Issue 1, 28-32

Notably, space not only offers a position of advantage for deploying a missile defense, it stimulates the development of new technology. Technological leadership includes the ability to resolve problems. Highlights of where technological leadership has been lacking in the current program for building a **missile** **defense**, include: The termination in 2001 of the Navy Area Wide **defense** program, which would have provided Aegis cruisers and destroyers with a **defense** against short-range ballistic **missiles** and aircraft like PAC-3. While the proposed SM-2 Block VIA interceptor for Navy Area Wide would have relied on a blast fragmentation warhead rather than hit-to-kill, differentiating it from PAC-3, its program termination may be viewed with disappointment. The termination in 2001 and 2002 of the **Space** **Based** Laser program, which would have provided a very effective boost phase **defense** against ballistic **missiles** of all types, short, intermediate, and long-range. Notably, the **Space** **Based** Laser program successfully demonstrated its end-to-end beam generation and training back in 1997. From that point on, the program's next step was to test a scalable high-energy laser in **space**. Presumably, the termination of the **Space** **Based** Laser program came as a result of opposition in the Senate to the deployment of **missile** **defenses** in **space**. Apparently lacking in the current administration was an understanding of the advantages of technological readiness of the **Space** **Based** Laser, unwilling to overcome apparent political opposition at a time when most Americans support **missile** defenses. Technological leadership also includes the ability to communicate the advantages of technology, as well as the ability to develop it. While the current administration has demonstrated its commitment to fund a **missile** **defense** and support the deployment of a ground-**based** **defense**, and has withdrawn from the ABM Treaty, it has yet to support a design to build an effective **defense**, much less insist on technological leadership. America's current plans include a virtual technological regression in any planning for a **space**-**based** interceptor **defense**, unwilling or unable to use past technology developed for Brilliant Pebbles. Unwilling or unable to use Brilliant Pebbles technology for **space**-**based** interceptors, the current administration and the Congress have been unwilling or unable to employ technological advances that have occurred in: The increasing use of robotics, including autonomous operation and data fusing and joint decision making between independently operating robots, which NASA has developed for missions on Mars. The development and increasing use of photonic or fiber optics for sensors, communications, and computer processing, which provide a means to defend against electromagnetic pulse. The development of three-dimensional computer chips, allowing for the integration of different processes, whether computer processing, communications, processing of sensor data, and active response within the same chip. These advances in photonics and computer chips, combined with continuing advances in nanotechnology, including Micro Electro Mechanical Systems or MEMS, could potentially allow for the development of kinetic kill vehicles smaller than Brilliant Pebbles, which were essentially **based** on late 1980's technology. Instead of building kinetic kill vehicles that weigh in the tens of kilograms, the United States could potentially be building kinetic kill vehicles that weigh under a kilogram, perhaps in the tens of grams, approaching the theoretical limits for kinetic kill vehicles suggested by Lowell Wood at Lawrence Livermore when he proposed the idea of Genius Sand as an advance generation Brilliant Pebble. America's defense planners seem to have a striking aversion to the development of advanced technology systems, especially those taking advantage of deployment in space, as seen not only in its termination of the Space Based Laser, but its very low level of funding for the development of a system of space-based relay mirrors that could utilize a high-energy laser to strike at targets around the world. This system of relay mirrors, suggested in the Strategic **Defense** Initiative as a way to take advantage of high energy laser technology that was ground-**based** or air-**based**, is being funded at a level of around $1 million when it should be funded at the billion-dollar level. The state of U.S. technological leadership is also seen by Pentagon planning to deploy a system of optical communication satellites, in other words, satellites using laser communications, which would provide much needed bandwidth and high security. These had been proposed in the early 1980's and the Air Force had performed some early demonstrations.

These tech spillovers to the civilian sector prompt space development

Kevin Haggerty teaches at the University of Alberta and Richard Ericson at Oxford University. The summary is taken for their article in Militarizing the American Criminal Justice System: The Changing Roles of the Armed Forces and the Police, edited by Peter Kraska, Boston: 2001, Northeastern University Press, pp. 43-64, http://crpr.icaap.org/issues/issue1/haggarty-ericson.html

Since World War II the defining attribute of the U.S. military has been its commitment to using advanced technology for military purposes. To that end it has funded any number of new technologies, academic institutions and individual scientists. Few technologies are now developed without being scrutinized for potential military applications. The range of technologies developed for military purposes and to military specifications is extensive and, very importantly, is not confined to lethal technologies. Hence, assorted sensors, visualization devices, electronics, communication systems, as well as nuclear energy, computers and space exploration can all be conceived of as military technologies by virtue of their genesis in military programs. These technologies, however, do not remain confined to their military context. Most eventually move into wider society through a ‘trickle down’ process of dispersion, where corporate interests work to develop potential civilian applications of technologies with a military origin. The computer provides a paradigmatic example of such a process, as prior to World War II there was little research on computing machines. The war effort galvanized efforts to develop computers, the first of which were used for assorted military purposes. In the ensuing years refinements in computational abilities have ushered in a new military ideology that emphasizes the use of information. Computers, however, have transcended their military origins, and are now a generalized technology capable of any number of different non-martial applications.

Military spending must come first --- directs the civilian market

Military and Aerospace Electronics 6 Private Aerospace Company, “Companies could profit by adopting military technology for civilian market,” 1/10/06, http://www.militaryaerospace.com/index/display/article-display/245158/articles/military-aerospace-electronics/online-news/companies-could-profit-by-adopting-military-technology-for-civilian-market.html

MAITLAND, Fla., 10 Jan. 2006. Milcom Technologies CEO Jason Rottenberg said no matter what happens to the Pentagon's budget in the next several years, companies developing civilian applications for military technology will likely benefit. That would be good for Maitland-based Milcom, which creates and nourishes businesses built on technology originally used in weaponry. "I think the government's investment in defense contractors will be good for us going forward," Rottenberg said. "The Defense Department's investment in technology paid off in Iraq. I don't think you will see less spending from that perspective." Many of the technological advances -- from communications systems to high-tech training equipment -- have been the genesis for businesses in the private sector. One Milcom creation, Mesh Networks of Maitland, turned a wireless broadband system into a civilian communications product that has been snapped up by communities around the country. Last year, Motorola bought the company, yielding a big return for Milcom. Rottenberg, 35, became Milcom's chief executive last fall. He joined the firm in 2000 and in 2003 took charge of OnPoint Technologies, a nonprofit venture with the U.S. Army that invests in small businesses developing technology that could benefit the military. Milcom and OnPointmake Rottenberg a gatekeeper. As Milcom searches defense contractors for ideas with civilian potential, OnPoint encourages technology companies to develop products with military applications. "Our specialty is investing in companies at the intersection of the commercial world and the defense department," Rottenberg said. He sees potential in both areas. OnPoint has 10 companies in its stable, which it helps through a $50 million federal fund. And Milcom nourishes six other businesses. Rottenberg, who succeeded retiring CEO Mike Buffa, said changing tactics in the Iraq war have created a steady demand for new military technology. That, in turn, has kept defense contractors busy. "These are great times for defense contractors," Rottenberg said. "Their share prices are doing well, and they are growing their top lines with the new opportunities coming to them." The only downside, from Milcom's perspective, is that the large contractors are so busy with Pentagon work that they have little incentive to explore civilian applications for their technology. Rottenberg said that when Pentagon funding eventually becomes leaner, the contractors will probably have more interest partnering with Milcom affiliates. "It's a cyclical business," he said. "If things slow down, there will be more time for companies to look for opportunities and they will be looking for other sources of revenue. So a slowing of the defense sector wouldn't necessarily have a downside for us." Rottenberg said that finding venture capital for products spun out from defense contractors remains Milcom's biggest challenge. "We remain affected by the ups and downs of the venture-capital community," Rottenberg said. "It's looks like the venture-capital market is starting to get hot again, which is encouraging."

That’s key to Space Colonization

Dinerman 7 Tyler Dinerman, Space author and journalist based in New York City, Writer for The Space Review, “Independent Space Colonization: Questions and Implications,” 1/15/07, http://www.thespacereview.com/article/784/1

The term “space colonization” has been declared off-limits in polite society. The “c-word” is supposed to invoke all the terrible aspects of old-fashioned imperialism, particularly European imperialism. One notes that neither the Japanese nor the Turks nor the Russians feel particularly guilty about their now-defunct empires. Even in Europe, the epicenter of the guilt trip questions are now being asked, there was a major debate in France last year over whether the “positive aspects of colonialism” should be taught in schools. If colonization is a dirty word, then so are “conquest”, “exploitation”, “settlement”, and “industrialization”. If fact, anything that goes beyond simple exploration is problematic. The Outer Space Treaty has theoretically forbidden any nation from claiming sovereignty over any “celestial body”. Within a couple of decades we will see if this approach can pass the reality test. If colonization is a dirty word, then so are “conquest”, “exploitation”, “settlement”, and “industrialization”. If fact, anything that goes beyond simple exploration is problematic. Once one or more bases are established on the Moon, nations will find themselves exerting control over parts of that body which, in practical terms, will amount to sovereignty. Within a moonbase, even one occupied by only a couple of astronauts, the government that sent them there will regulate their lives in more or less the same way a government regulates the lives of the crew of a warship. The ship itself is considered the sovereign territory of the state that owns it while the waters through which it passes may be international or belong to another sovereign state that is obliged to respect the right of innocent passage. The ship’s crew lacks anything like the ability to function as free citizens and to buy sell and trade in a free marketplace. One question that advocates for space colonization have to consider is: how can the transition from a quasi-military lifestyle to a civilian one be handled? The experience that many communities in the US have had when a nearby military base closed down might be relevant. Another source of experience might be the transitions from martial law to civilian law that have taken place over the years, including the one that happened in Hawaii at the end of the Second World War. None of these have involved any change in sovereignty. Post World War Two decolonization involved such a change. Yet, if the provision in the Outer Space Treaty (OST) regarding their extended responsibility of launching states for whatever they put into space means anything, it mean that states will have to exercise control over the inhabitants of a colony no matter how long ago their ancestors left Earth. It is difficult to imagine a third or fourth generation inhabitant of Mars or of another “accessible planetary surface”, to use the old NASA euphemism, accepting the right of a distant Earth government to control any aspect of their lives, let alone the kind of regulations promulgated under martial law. Their reaction to such control might not be a quick and easily mollified revolt, but a more permanent split between the Earthbound and the spacefaring parts of humanity. In the long term the effort to impose controls on private space colonization by the use of a vague process of international consensus-seeking will create a reaction not only against the OST but against the whole idea that Earth governments should be allowed any say whatsoever in the governance of off-Earth activities. In the near term it is relatively easy for governments to impose their will on space activities, but when vehicles that can provide low-cost access to low Earth orbit are as available to the public as oceangoing private yachts, maintaining control will be much harder. In the long term the effort to impose controls on private space colonization by the use of a vague process of international consensus-seeking will create a reaction not only against the OST but against the whole idea that Earth governments should be allowed any say whatsoever in the governance of off-Earth activities. Authoritarians, even soft authoritarians, resent the easy mobility that people have acquired with the widespread ownership of private vehicles. A citizen who can pack up his or her possessions and move elsewhere is harder to control than one who is stuck in a village or neighborhood and requires state-controlled public transport to get anywhere. Low-cost space transportation implies a loss of government power. Worldwide there is a powerful political bias towards ever more powerful government. Long-term technological trends, in materials and biotech as well as in information systems, tend to push the other way. Supporters of the OST will find themselves stuck between these two trends. The conflict between those in the US who want to revise the treaty to enshrine property rights and a broadly “American” view of human freedom and those with different ideas and priorities makes any revision of the OST problematic. This probably does not mean that the treaty will be junked, like the ABM Treaty was, any time soon, but it does mean that the treaty will have less and less relevance to the future of humankind in the solar system.

Space exploration is necessary to solve inevitable, guaranteed human extinction

Objective Observer 3 (“The Case for Colonizing Mars”, July, http://www.theobjectiveobserver.com/articles/space01.shtml)

Homo sapiens, human beings, have to be one of the least intelligent species on the planet. I realize that this statement flies in the face of most scientific evidence given the large brain capacity of homo sapiens, the use of tools by homo sapiens and the fact that homo sapiens can engage in abstract thought. However, all of these traits make it that much more unlikely and fantastic that homo sapiens as a species continue to largely ignore the colonization of Mars. One simple fact screams out for human beings to **colonize Mars with all due haste**. That fact makes it crystal clear that the Earth has a deplorable track record when it comes to its ability to support life. Consider that 99.9% of all species that have ever existed on planet Earth are extinct. Now, when you look at that fact, please also consider that this does not mean that .1% of species have survived since the dawn of time. The .1% figure simply represents species that have yet to go extinct. In other words, we happen to have some species alive and thriving on the Earth today. Those species by and large evolved relatively recently. Thus, the .1% figure is not really a survival rate but rather a percentage of all species that have ever existed on the Earth that currently happen to be alive. Another way of viewing this is in terms of survival rate as a function of time instead of as a function of species. If we were to look at all species that have existed during the last 10 years, the survival rate would be close to or at 100%. In other words, of all the species that have existed on planet Earth for the last 10 years, no extinctions have occurred. If we were to look at species that have existed for the last 1,000 years that 100% figure would drop slightly due to extinctions such as the dodo and the passenger pigeon. Looking at the survival rate species that have existed for the last 10,000 years, that 100% figure would be even less and as we go further and further back in time, the survival rate would approach or become zero. Therefore, we can state as a certainty that the longer a species exists on the Earth, the more likely it becomes that that species will become extinct and this continues until that **species’ extinction is a certainty**. What causes these extinctions? Irrelevant. I am not here to debate the cause of animal extinctions. There are many theories regarding why extinctions occur. The most popular today being that **asteroids** and/or comets **randomly strike the Earth** every millennia or so and serve as a first strike that initiates extinction. Asteroids and comets are currently blamed for many of Earth’s mass extinctions throughout its history. However, regardless of whether extinctions occur by asteroid, by comet or by some other as yet unknown device, the fact that 99.9% of species that have ever existed on the Earth are extinct remains the same. Consider also that human beings are on the top of the food chain, quite similar to dinosaurs in their day. Why is this relevant? Well, for one simple fact. Land extinctions tend to kill off the large, dominate animals at the top of the food chain while some of the smaller animals near the bottom of the food chain survive. Oddly enough, mass extinctions seem to happen in reverse in the ocean, the smaller animals at the bottom of food chain become extinct and the ones at the top of food chain tend to survive. This may actually explain why intelligence evolved first on land instead of in the oceans, but that is the subject of a different essay. Of course, one might argue that there has never been a species of animal on the Earth that was so intelligent, so diverse and so well adapted to its environment as are homo sapiens. Thus, the argument is that if there is going to be a species that survives a mass extinction, homo sapiens have the best chance. However, this argument is rather full of logical errors in reasoning. First, in terms of diversity and adaptation, homo sapiens rather pale in comparison to other successful organisms such as all of the species of dinosaurs. Second, there is absolutely no evidence that intelligence has anything to do with surviving a mass extinction. Thus, we have a few simple scientific facts that human beings have been quite aware of for several decades that make it perfectly clear to any reasonable mind that **human beings WILL become extinct if they remain solely on** planet **Earth**. **And yet, human beings** by and large **are doing very little to colonize Mars**. And by very little, I do not mean to denigrate those individuals that have written on this subject or those at NASA and other agencies around the world that are working right now on all of the problems associated with colonizing Mars. However, what I am proposing is to make the colonization of Mars a priority of the United States and world governments second only to national defense. This last argument is sure to spark protests and outrage from many different sectors I am sure. I can hear the arguments now. “We have enough problems to solve here on Earth first before we start trying to colonize other planets.” “Why not put resources into deflecting or destroying asteroids and comets instead of colonizing Mars?” “We do not have the technology to colonize Mars.” “Why not colonize the oceans?” Why not colonize the Moon?” “We have no evidence that colonizing Mars will avoid human extinction.” I will address each of the arguments in turn. “We have enough problems to solve here on Earth first before we start trying to colonize other planets.” This statement is very true, human society is fraught with all kinds of problems. However, **all other problems pale in comparison to the extinction of the species**. The reason is simple. If homo sapiens as a species becomes extinct, **all other problems are irrelevant**. “Why not put resources into deflecting or destroying asteroids and comets instead of colonizing Mars?” This one is quite simple. First, one should know that we probably only know of about 5% of the asteroids and/or comets that pose a severe threat to the Earth. If one of those asteroids within that 5% was going to hit the Earth, we would have some warning; maybe enough to come up with and successfully execute a plan to deflect it. However, for the other 95%, we would have little or no warning. Second, we do not know for a certainty that asteroids or comets cause mass extinctions. We have some pretty good evidence that points to this, but nothing certain. Mass extinctions might be caused by viruses or some as yet unknown device. The only certainty in preserving the human species is to expand beyond the bounds of planet Earth. “We do not have the technology to colonize Mars”. Yes we do. We are 100 or perhaps a 1,000 times more prepared today to tackle the problem of Mars colonization than we were to tackle the problem of landing on the moon. Our society is perhaps the best prepared it has ever been throughout its entire history to tackle such an exploration and colonization. Quite simply, we have the technology today to begin terraforming and permanently colonizing Mars. In addition, it has already been proven that when nations make certain well-defined goals and objectives top priority, the problem is solved with surprising rapidity. This can be seen with the development of the atomic bomb as well as the Apollo program to land on the moon. “Why not colonize the oceans?” This argument stems from the fact that ocean extinctions tend to occur in reverse of land extinctions. That is, the big, dominant animals at the top of the food chain tend to survive ocean mass extinctions. First, human beings are not native to the oceans and therefore, the normal “rules” would not apply. Second, big, dominant animals do go extinct in the oceans. Third, 99.9% of all species that have ever inhabited the earth, on land and on water have gone extinct. Expanding to an ocean environment does not change that fact. “Why not colonize the Moon?” Indeed, this seems reasonable. It gets our species off of planet Earth and the Moon is a lot closer than Mars. However, the Moon lacks the ability to support a self-sustaining human colony. A Moon colony would be much too dependent on Earth for its very existence. This does not mean that we should not pursue a permanent Moon colony. Indeed, a permanent Moon colony may be a crucial step in colonizing Mars. However, a Moon colony cannot serve as a replacement for Mars colonization. “We have no evidence that colonizing Mars will avoid human extinction.” This is absolutely true. However, we know for a fact that **it is a certainty that if we remain solely on planet Earth we will go extinct**. We also know that creating a self-sustaining colony on another planet is the best and perhaps **only way to avoid extinction**. And Mars is the **most likely candidate** within our solar system for colonization.

### B. COMPETITIVENESS

US competitiveness will inevitably collapse --- productivity and high-tech leadership’s declining

Hersh and Weller 11 – Adam S. Hersh, Economist at the Center for American Progress, Christian E. Weller, Senior Fellow at the Center and an associate professor, department of public policy and public affairs, at the University of Massachusetts Boston, 2-9-11, “Measuring Future U.S. Competitiveness U.S. Productivity and Innovation Snapshot,” Center for American Progress, http://www.americanprogress.org/issues/2011/02/pdf/productivity\_snapshot.pdf

Productivity growth—the rate at which we increase production with a given amount of work and resources—is critical to our national economic prosperity and competitiveness, and a factor tied closely to the pace of real investment. Investments in equipment and innovation lead to productivity growth, and productivity growth leads to long-run increases in our standard of living. As the U.S. economy continues to pull out of the Great Recession, a number of trends point to clear signs of trouble for present and future U.S. competitiveness. First, investment continues at a slow pace, barely keeping up with capital depreciation. Second, the effects of slow investment can be seen in lagging productivity growth, which is below average for this point in a business cycle. Third, the U.S. high-tech trade deficit is widening once again

Space weapons enhance US tech superiority

Kleinberg 7—Howard Kleinberg, MS in Security Studies and member of the graduate faculty of the Department of Public & International Affairs, “On War in Space”, August 2, 2007, Taylor and Francis, Volume 5, Issue 1, pg 1-27

Current U.S. space-based capabilities represent just such a strategic advantage over potential adversaries. However, this very advantage also constitutes both a critical dependency and a strategic vulnerability, given its lack of physical defenses. Loss of these space-based capabilities would result in U.S. strategic paralysis, in both military and economic terms. To achieve the greatest possible warfighting advantage, a third and final key derivation from the proffered space warfare theory is that U.S. space weapons should include not just the capability to conduct combat operations in space, but should also incorporate “overwhelming” technological advantages over opposing space weapons technologies, such as was the case with terrestrial weaponry in Desert Storm. Technological advantage is particularly critical in space warfare, for it is only with technology that space presence can even be achieved, let alone contested. This offset strategy would add greatly to the likelihood of success in the event of a conflict in space. Further, and also in line with the technological-superiority strategy described by Carter, Letter, and Smith above, is that technologically-advanced space weapons systems could deter future potential adversaries from actually developing and deploying them, decreasing the odds that such a conflict in space would ever take place. In the best case scenario, this could lead to the dissuasion of current and future enemies from having their own space weapons programs. The next-best result would be the delay or downgrading of weapons systems deployed by enemies. Even in the worst case, the dislocating effects and resultant combat advantages of superior U.S. space forces could result in enemies' use of less-than-optimal strategies or commission of outright errors in conducting space combat operations. Of course, superior technology will likely prove decisive in any actual space combat engagements, provided that the advantage is sufficient to counter any asymmetric strategies that might be employed by a less capable space adversary. For instance, a space power with both full Space Situational Awareness and space-based, global-coverage-enabling missile defenses could effectively detect and thwart any attempt by a lesser power to employ asymmetric attacks such as a direct ascent anti-satellite weapon (ASAT) or High-Altitude Nuclear Detonation, as well as its intended missile defense mission. 60

Now’s key --- investment in space deters other countries from investing --- boosts US tech leadership

Dolman and Cooper 11- Everett C. Dolman is PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies and Henry F. Cooper, Jr. is Chairman of the Board of Directors of High Frontier and Chairman Emeritus of Applied Research Associates, former Deputy Assistant Secretary of the Air Force, 2011, “Increasing the Military Uses of Space”, Chapter 19 in the book “Security and Spacepower”, edited by Colonel Charles D. Lutes -USAF, is Senior Military Fellow in the INSS Research Directorate and Dr. Peter L. Hays is a senior policy analyst at National Security Space Office, http://www.ndu.edu/press/space-Ch19.html

All states will oppose an American military occupation of space, and their combined power will accelerate the demise of the United States. There is no doubt that the United States will be opposed in its efforts to dominate space militarily. There will always be fear that any state attempting to enhance its power may use it to act capriciously, but to suggest that the inevitable result is a space arms competition is the worst kind of mirror-imaging. If the United States, in the very near future, were to seize space, it would do so in an attempt to extend its current hegemonic power. Other states may feel threatened by this and will certainly begrudge it, but would any be willing to bankrupt their economies to develop the multi-trillion-dollar infrastructure necessary to defeat the United States in space, all the way up the daunting gravity well of Earth? Especially after the first billions were spent and a weapons system was launched, if the United States showed the will to destroy that rocket in flight (or the laser on the ground), how long would another state be willing to sustain its commitment to replacing America as controller of space?

On the other hand, any attempt by another power to seize and control space must be viewed as an attempt to overturn the extant international order, to replace America as the global hegemon. The United States, with investment already made in the necessary space infrastructure, would be forced to compete or cede world leadership—the latter an unlikely decision, one never historically taken by the reigning hegemon. The lesson is unambiguous; if you want an arms race in space, wait for it.

Specifically --- the aerospace industry will inevitably collapse due to retirements—increased investment is key to maintain competitiveness

AIA 6/30/11—Aerospace Industries Association, “AIA Calls for Continued Aerospace Investment” online: http://www.aia-aerospace.org/newsroom/aia\_news/aia\_calls\_for\_continued\_aerospace\_investment/

Former FAA Administrator and current President and CEO of the Aerospace Industries Association, Marion C. Blakey, called for accelerated implementation of FAA’s Next Generation Air Transportation System and increased U.S. investment in research and development to avoid losing our leadership in aerospace and defense. “It’s important to properly fund and promote our aerospace and defense industry and the research and development needed to sustain it,” Blakey said at a luncheon hosted by the Aero Club of Washington today. Blakey also said that it was important for the aerospace industry to underscore the critical role of aerospace and defense in supporting our nation and economy, especially during ongoing budget debates. AIA is launching a campaign called Second to None to ensure that Congress and other officials understand that the industry is a perishable national asset. “The aerospace and defense industry – which is second to none in the world, represents a smart business decision,” said Blakey. “Our products keep the world’s economy moving, our families safe at home and our troops secure and successful abroad.” Further identifying the issues that place the industry at a crossroads, she said that half of U.S. aerospace engineers will become eligible for retirement by 2015. In addition, for the first time in 100 years, no new manned military aircraft are in design. Outdated export rules are hampering businesses as well as unmanned aerial systems, which Blakey called “game-changers in this century.” NextGen will help environmental efforts by saving fuel and reducing emissions. The aviation industry has committed to achieve carbon-neutral growth by 2020 through the use of NextGen technologies and green fuel alternatives. However, these **initiatives require government support**, including R&D funding for FAA and NASA.

The plan would create an influx of youth in the aerospace sector

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraff Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

One effect of the 9/11 terror attacks was a change in attitudes on college campuses among students. Anti-defense stances frequently found among faculty members are not as prevalent among students today, who may be increasingly prepared to make a contribution to defense. This suggests that **if the U.S. government were to organize a new** research and development **program focused on developing** innovative ideas to exploit **space and space defense, a cadre of students would be interested in working in those areas. Such a program would help to replenish the badly deteriorating workforce of scientists and engineers in the aerospace sector.** Specifically, the United States needs to restore federal support for, and funding of, physical science research and engineering at least to the level currently received by biological research. At a minimum Department of Defense S&T funding should reach 3 percent of total defense spending. In order to revive interest among students and faculty in space and defense technology in U.S. colleges and universities, the National Science Foundation should be reorganized to support funding of space security research under specific budgetary authority following the NSF model for materials science research. Similar to the materials science model, a program of research funding solicitations and awards in missile defense-related S&T should be developed. Moreover, the missile defense component of space security research should be supported by advisory and peer groups with expertise that would evolve with the technology as part of a new missile defense science and technology collegial community.

Brilliant Pebbles stimulates the US technology base and supports the aerospace industry

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraff Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

In addition to the very valuable lunar data collected, Clementine served as a highly successful test-bed for twenty-three lightweight SDI technologies, all of which performed properly. A number of these technologies were directly related to the Brilliant Pebbles program. Specifically, Clementine’s cameras and sensors had been developed for BP. Clementine also verified the autonomous operational mode that was to have been employed with Brilliant Pebbles. This verification came during orbit number 303, when Clementine operated in a completely autonomous mode throughout the full orbit. Given these achievements, Ambassador Cooper was not wide of the mark when he wrote in May 2001 that “the Clementine deep-space probe successfully space-qualified nearly the entire suite of first-generation Brilliant Pebbles hardware . . . and software.”95 Beyond these accomplishments, Clementine lent support to the philosophy that had initially guided the Brilliant Pebbles development and acquisition process – the maximum use of commercial off-the-shelf components and a minimum reliance on hardware designed to military specifications. Those who developed Clementine referred to the probe as “a desktop computer hooked up to some camcorders and a mobile phone.”96 The success of Clementine also points up one of the basic characteristics of development programs like Brilliant Pebbles. The knowledge and technical developments spawned by such programs do not simply evaporate when a program is terminated. Instead, **they remain in the technology base that supports U.S. aerospace developments**.97 Brilliant Pebbles was an integrating concept that started out by drawing upon America’s broad technology base, military and commercial, for the components needed to make the interceptor a reality. During BP’s short four-year life, it enhanced these components and related knowledge, and both the components and the knowledge remained in the U.S. technology base when Brilliant Pebbles was canceled. Indeed, in 2001, Lawrence Livermore National Laboratory responded to renewed interest in space-based interceptors under the administration of President.

Competitiveness prevents great power war --- now is key

Sanjaya Baru 2009 is a Professor at the Lee Kuan Yew School in Singapore Geopolitical Implications of the Current Global Financial Crisis, Strategic Analysis, Volume 33, Issue 2 March 2009 , pages 163 - 168

Hence, economic policies and performance do have **strategic consequences.**2 In the modern era, the idea that strong economic performance is the **foundation of power** was argued most persuasively by historian Paul Kennedy. 'Victory (in war)', Kennedy claimed, 'has repeatedly gone to the side with more flourishing productive base'.3 Drawing attention to the interrelationships between economic **wealth, technological innovation, and the ability of states to** efficiently **mobilize economic and technological resources for power projection and national defence**, Kennedy argued that nations that were able to better combine military and economic strength scored over others. 'The fact remains', Kennedy argued, 'that all of the major shifts in the world's military-power balance have followed alterations in the productive balances; and further, that the rising and falling of the various empires and states in the international system has been confirmed by the outcomes of the **major Great Power wars**, where victory has always gone to the side with the greatest material resources'.4 In Kennedy's view, the geopolitical consequences of an economic crisis, or even decline, would be transmitted through a nation's inability to find adequate financial resources to simultaneously sustain economic growth and **military power**. The classic 'guns versus butter' dilemma. Apart from such fiscal disempowerment of the State, economic under-performance would also reduce a nation's attraction as a market, as a source of capital and technology, and as a 'knowledge power'. As power shifted from Europe to America, so did the knowledge base of the global economy. As China's power rises, so does its profile as a 'knowledge economy'. Impressed by such arguments, the China Academy of Social Sciences developed the concept of Comprehensive National Power (CNP) to get China's political and military leadership to focus more clearly on economic and technological performance than on military power alone in its quest for Great Power status.5 While China's impressive economic performance, and the consequent rise in China's global profile, has forced strategic analysts to acknowledge this link, the recovery of the US economy in the 1990s had reduced the appeal of the Kennedy thesis in Washington, DC. We must expect a revival of interest in Kennedy's arguments in the current context. A historian of power who took Kennedy seriously, Niall Ferguson, has helped keep the focus on the geopolitical implications of economic performance. In his masterly survey of the role of finance in the projection of state power, Ferguson defines the 'square of power' as the tax bureaucracy, the parliament, the national debt, and the central bank. These four institutions of 'fiscal empowerment' of the state enable nations to project power by mobilizing and deploying financial resources to that end.6 Ferguson shows how vital sound economic management is to strategic policy and **national power**. More recently, Ferguson has been drawing a parallel between the role of debt and financial crises in the decline of the Ottoman and Soviet Empires and that of the United States. In an early comment on the present financial crisis, Ferguson wrote: We are indeed living through a global shift in the balance of power very similar to that which occurred in the 1870s. This is the story of how an over-extended empire sought to cope with an external debt crisis by selling off revenue streams to foreign investors. The empire that suffered these setbacks in the 1870s was the Ottoman empire. Today it is the US. … It remains to be seen how quickly today's financial shift will be followed by a comparable geopolitical shift in favour of the new export and energy empires of the east. Suffice to say that the historical analogy does not bode well for America's quasi-imperial network of bases and allies across the Middle East and Asia. Debtor empires sooner or later have to do more than just sell shares to satisfy their creditors. … as in the 1870s the balance of financial power is shifting. Then, the move was from the ancient oriental empires (not only the Ottoman but also the Persian and Chinese) to western Europe. Today the shift is from the US - and other western financial centres - to the autocracies of the Middle East and East Asia. …7 An economic or financial crisis may not trigger the decline of an empire. It can certainly speed up a process already underway. In the case of the Soviet Union, the financial crunch caused by the Afghan War came on top of years of economic under-performance and the loss of political legitimacy of the Soviet State. In a democratic society like the United States, the political legitimacy of the state is constantly renewed through periodic elections. Thus, the election of Barack Obama may serve to renew the legitimacy of the state and by doing so enable the state to undertake measures that restore health to the economy. This the Soviet State was unable to do under Gorbachev even though he repudiated the Brezhnev legacy and distanced himself from it. Hence, one must not become an economic determinist, and historic parallels need not always be relevant. Politics can **intervene and offer solutions**. Political economy and politics, in the form of Keynesian economics and the 'New Deal' did intervene to influence the geopolitical implications of the Great Depression. Whether they will do so once again in today's America remains to be seen.

And, reinvigorating US economic leadership doesn’t trade off with other countries --- it’s not a question of a zero sum race, but of who has the most relative economic power --- the rise of the rest is inevitable, but US economic leadership is key to making it safe --- the alternative is global wars and trade collapse

James O'Connor 2008 is an American sociologist and economist. He is currently an Emeritus Professor of Sociology and Economics at the University of California , “Economic Rise of the East” November 26, 2008 http://www.acus.org/new\_atlanticist/economic-rise-east

In its latest report entitled Global Trends 2025: A Transformed World, the National Intelligence Council has made various predictions about the continuing and changing influence of globalization around the world. It is argued that “as some countries become more invested in their economic well-being, incentives toward geopolitical stability could increase.” This is positive. Indeed one of the goals of economic interconnectedness is to **disincentive military conflict**; in addition it has created an unprecedented increase in prosperity worldwide. The assertions of the report are generally positive about globalization, however also identified are troubles looming that could affect this economic progress; these include competition for resources, aging populations, global economic imbalances and popular **backlash against a more open international system**, and **resulting fragmentation** and regionalism.

The **continued dominance of the United States** (albeit relatively weakened) **is a key idea** of the report. Whether it wants it or not, **the US must continue in its global economic leadership role – if not us- who**? There appear to be no other widely acceptable alternatives. However, trends in globalization, already underway, are predicted to change the nature of the global economy to one that is more multipolar and where economic growth is more diffuse. The executive summary states:

In terms of size, speed, and directional flow, the transfer of global wealth and economic power now under way – roughly from West to East – is without precedent in modern history. This shift derives from two sources. First, increases in oil and commodity prices have generated windfall profits for the Gulf States and Russia. Second, lower costs combined with government policies have shifted the locus of manufacturing and some service industries to Asia.

Growth projections for Brazil, Russia, India and China (the BRICs) indicate they will collectively match the original G-7’s share of global GDP by 2040-2050. China is poised to have more impact on the world economy over the next 20 years than any other country. If current trends persist, by 2025 China will have the world’s second largest economy and will be a leading military power.

This may provoke fear for some; in the body of the report however, it is clarified that this is a “global shift in relative wealth and economic power.” **The key word here is relative**. The implication being that emerging markets are experiencing rapid increases in wealth, wealth that is bringing them more into line with the industrialized world; however, **this does not imply that the rest of the world will become poorer** as a result. The development of the global economy is **not a zero-sum game**. Emerging countries are getting a bigger slice of the pie, that is certain, but at the same time, the pie itself is getting bigger. China’s economic rise does not necessarily entail a poorer west. In fact, the opposite is true. As the middle class grows globally, in particular in the BRIC countries, it adds greatly to economic growth everywhere and opportunities for companies to expand their markets.

According to the report, “Over the next several decades the number of people considered to be in the ‘global middle class’ is projected to swell from 440 million to 1.2 billion or from 7.6 percent of the world’s population to 16.1 percent.” Almost 1 billion new consumers with disposable income is an opportunity – no question. Although emerging markets will generate new globally competitive corporations to serve these consumers, in many ways U.S. and European companies with their longer experience of designing marketable products and adapting quickly to consumer tastes will likewise benefit from this enormous expansion of business. At the same time, new globally competitive corporations from emerging countries will bring lower prices and benefits to consumers in industrialized countries creating a more competitive and thus more robust companies and a truly global economic system –a benefit for all. **The key will be maintaining open markets for the flow of goods, capital and services**. This may prove difficult in the current climate.

In the report the idea is put forth that global corporations from the emerging economies will help “to further solidify their positions in the global marketplace; from Brazil in agribusiness and offshore energy exploration; Russia in energy and metals; India in IT services, pharmaceuticals, and auto parts; and China in steel, home appliances, and telecommunications equipment.” It is a natural development of globalization that strong companies will emerge from all corners of the globe. However, these newly global companies will undoubtedly bring greater competition to established multinationals in the west as each seeks to expand its global reach. **Protectionism** in developed countries may be an (unwelcome) result of this competition, particularly with expansion by state-owned enterprises that, “will **raise political tensions**, potentially creating a **public backlash in countries against foreign trade** and investment.” In fact, the current financial crisis and the economic recession that is to follow may exacerbate this trend towards protectionism. Resistance to change is inevitable, but so is the change itself, hopefully coordinated agreements to fight protectionism at the international level can help to mitigate this resistance.

One of the Key Uncertainties mentioned is “whether mercantilism stages a comeback and global markets recede.” Some of these tendencies are already underway with some countries introducing new export subsidies and competitive currency devaluation. Furthermore, support for this type of “mercantilist”policy may become more ubiquitous with competition for resources, cited as a major dark cloud on the horizon by the report. The positive effects of the emergence of millions from poverty into a consumer middle class will also bring about potential **conflict for increasingly scare resources**. In one possible scenario of the report, A World Without the West¸this type of development is outlined.

“Anti-China antagonism in the US and Europe reaches a crescendo; protectionist trade barriers are put in place. Russia and China enter a marriage of

convenience; other countries – India and Iran – rally around them. The lack of any stable bloc – whether in the West or the non-Western world – adds to growing instability and disorder, potentially threatening globalization.” Scary indeed. The time to act to counter these trends is now, reinvigorating the WTO and concluding Doha- important not only for the trade it liberalizes, but for the reductions in tariffs agreed that then become more difficult to raise in times of protectionist pressure.

The report’s conclusions clearly show that we have moved to a new, global economic reality – one that has multiple poles of economic power. As we move forward, countries will surely have to adapt, Europe and Japan in particular are facing potential problems due to aging populations, the US will have to accommodate new economic powers in the world. We have to address the issues that this shift raises, but what we don’t want is a world economy that becomes more **antagonistic, fragmented and regional**. The time to address this is now.

### [OPTIONAL – NOT IF READING HEGE ADV]

Technological power key to heg

Rocco, Martino 7 Senior Fellow at the Foreign Policy Research Institute “A Strategy for Success: Innovation Will Renew American Leadership,” Orbis, Volume 51, Issue 2

Much of the foreign policy discussion in the United States today is focused upon the dilemma posed by the Iraq War and the threat posed by Islamist terrorism. These problems are, of course, both immediate and important. However, America also faces other challenges to its physical security and economic prosperity, and these are more long-term and probably more profound. There is, first, the threat posed by our **declining competitiveness** in the global economy, a threat most obviously represented by such **rising economic powers** as China and India.1 There is, second, the threat posed by our increasing dependence on oil imports from the Middle East. Moreover, these two threats are increasingly connected, as China and India themselves are greatly increasing their demand for Middle East oil.2 The United States of course faced great challenges to its security and economy in the past, most obviously from Germany and Japan in the first half of the twentieth century and from the Soviet Union in the second half. Crucial to America's ability to prevail over these past challenges was our **technological and industrial leadership**, and especially our ability to continuously recreate it. Indeed, the United States has been unique among great powers in its ability to keep on creating and recreating new technologies and new industries, generation after generation. Perpetual innovation and technological leadership might evenbe said to be the **American way of maintaining primacy** in world affairs. They are almost certainly what America will have to pursue in order to prevail over the contemporary challenges involving economic competitiveness and energy dependence. There is therefore an urgent need for America to resume its historic emphasis on innovation. The United States needs a **national strategy** focused upon developing new technologies and creating new industries. Every successful strategy must define an objective or mission, determine a solution, and assemble the means of execution. In this case, the objective is economic superiority; the solution is new industries which build upon the contemporary revolution in information technology; and the means of execution will have to include a partnership of industry, government, and people.3

Competitiveness is the largest internal link to primacy

Gelb 10 [Leslie H. Gelb, a former New York Times columnist and senior official in the state

and defense departments, is currently president emeritus of the Council on Foreign Relations, Fashioning a Realistic Strategy for the Twenty-First Century,” Fletcher Forum of World Affairs vol.34:2 summer 2010 http://fletcher.tufts.edu/forum/archives/pdfs/34-2pdfs/Gelb.pdf]

Power is what it always has been. It is the ability to get someone to do something they do not want to do by means of your resources and your position. It was always that. There is no such thing in my mind as “soft” power or “hard” power or “smart” power or “dumb” power. It is people who are hard or soft or smart or dumb. Power is power. And people use it wisely or poorly. Now, what has changed is the composition of power in international affairs. For almost all of history, international power was achieved in the form of military power and military force. Now, particularly in the last fifty years or so, **it has become more and more economic**. So power consists of economic power, military power, and diplomatic power, but the emphasis has **shifted from military power** (for almost all of history) to now, more economic power. And, as President Obama said in his West Point speech several months ago, our economy is the **basis of our international power** in general and our **military power** in particular. That is where it all comes from.

Whether other states listen to us and act on what we say depends a good deal on their perc**eption of the strength of the American economy**. A big problem for us in the last few years has been the perception that our economy is in decline.

# \*\*1AC Leadership

## Leadership Internal Link

Lack of U.S. interest in the full use of space now- pushing space advocates away from the military

Logston 03- John M. Logsdon is Director of the Space Policy Institute of George Washington University’s Elliott School of International Affairs in Washington, DC. “REFLECTIONS ON SPACE AS A VITAL NATIONAL INTEREST” p. 4-6 <http://www2.gwu.edu/~spi/assets/docs/space_as_a_national_interest.pdf>

If access to and full use of space is indeed a vital national interest, one would think that this situation would be very troubling to the U.S. national leadership. The reality appears rather different. The space sector has suffered from lack of high-level White House attention for most of the past three decades.9 Budgets for civilian and national security space have been relatively level for the past decade, with the NASA budget actually in decline if adjusted for inflation. Congress has dealt with space funding issues only at the margins, or to make sure the interests of particular Congressional districts are well-served. Neither the White House nor Congress has staked out a leadership position with respect addressing the current problems in the space sector. The Aerospace Commission noted the result of this neglect: “Today, however, a sense of lethargy has infected the space industry and community. Instead of the excitement and exuberance that dominated our early ventures into space, we at times seem almost apologetic about our continued investments in the space program.”10 Commissioner John Hamre, Deputy Secretary of Defense during the Clinton administration, was even more direct, suggesting that “the U.S. aerospace industry is in deep trouble. Satellite and space-launch manufacturers are in serious financial difficulty and the industry is near collapse.”11 A Leadership Failure? This essay reflects on the reasons behind the gap between current realities and rhetoric about the importance of space to U.S. interests. It asks the question: “If U.S. ability to access and use space really is a vital national interest, why is it currently in such a distressed condition?” A frequent answer to this question, offered particularly by those convinced of the vital importance of space capabilities, is that there has been a failure of vision on the part of the national leadership, who seem not to recognize the multifold contributions that space capabilities make to the country’s interests and the need for increased investments to obtain the benefits of those capabilities. Space advocates are understandably frustrated by the lack of program and funding priority given to space issues by the White House and Congressional leaders in recent years, even when policy statements which they have endorsed call for such priority. Space policy is still a “niche issue” at both ends of Pennsylvania Avenue, not high on the national agenda or on the agenda of powerful individuals. It is worth noting that this perception of failed national leadership is commonly noted by many different sectors, each contending for the attention and favor of senior government leaders. Each sector believes that its issues deserve higher policy priority and usually additional funding. The task of leaders and those who support them is to sort through competing claims and allocate limited resources according their judgment of future payoffs from current investments. Given the political character of the U.S. policymaking process, this sorting process is messy and often only approximates rational behavior. There is no objective means to evaluate the performance of national leaders in reaching policy and funding decisions; that evaluation is provided through the electoral process. So assigning a “failed” grade to leadership performance is a very subjective act.

The plan changes the perception of space to a vital national interest

Logston 03- John M. Logsdon is Director of the Space Policy Institute of George Washington University’s Elliott School of International Affairs in Washington, DC. “REFLECTIONS ON SPACE AS A VITAL NATIONAL INTEREST” p. 1-4 <http://www2.gwu.edu/~spi/assets/docs/space_as_a_national_interest.pdf>

In its November 2002 report, the Commission on the Future of the United States Aerospace Industry1 concluded that “nations aspiring to global leadership in the 21st century must be space faring.” The Commission called upon the United States to create a “space imperative.”2 Leaving aside for the moment a definition of what such a “space imperative” might contain, the Commission’s conclusion about the importance of space capabilities to U.S. national interests is only the latest in a string of such declarations. A few years ago, the Long Range Plan of the U.S. Space Command suggested that “space is emerging as a military and economic center of gravity for our information-dependent forces, businesses, and society.” 3 The Commander of the U.S. Space Command at the time, General Howell Estes, went further, suggesting that space “will be considered a vital national interest – on par with how we value oil today . . .”4 The suggestion that access to space and its uses should be a high priority U.S. concern was echoed in the Clinton administration’s December 1999 A National Security Strategy for a New Century, which stated that “we are committed to maintaining U.S. leadership in space. Unimpeded access to and use of space is a vital national interest – essential for protecting U.S. national security, promoting our prosperity and ensuring our well-being.”5 This view was repeated in the Bush administration’s September 2001 Quadrennial Defense Review, which concluded that “because many activities conducted in space are critical to America’s national security and economic well-being, the ability of the United States to access and use space is a vital national interest.”6 Specific wording is important here. The phrase “vital national interest” is applied in U.S. government policy documents only to those U.S. objectives and capabilities so important that the nation would use armed force to protect and preserve them. It would be logical to conclude that if space were indeed a vital national interest, it would receive high priority in government policy and funding decisions to ensure that the country was committed to the pursuit of space power – “the pursuit of national objectives through the medium of space and the use of space capabilities.”7This is not the reality, however. There is a substantial gap between statements about the high importance of space to U.S. interests, and both the current state of U.S. space capabilities and the priority given to the space sector by the country’s leadership. The result is that a seemingly crucial national security, economic, public service, and scientific capability rests on a very fragile foundation. Aspects of that fragile foundation include the following: U.S. access to space for critical payloads is based on a space shuttle that is very expensive to operate and subject to too-frequent groundings, and on two new Evolved Expendable Launch Vehicles, the Atlas V and the Delta IV, which depend on a diminishing commercial launch market or increased government subsidies for their economic viability. Elements of an aging launch infrastructure are badly in need of revitalization. A decision on developing a fully reusable launch vehicle continues to be pushed into the indefinite future. Already approved new national security space programs such as the Space Based Infrared System and the Future Imagery Architecture are behind schedule, over budget, and facing unresolved technical problems. Meanwhile, proposed new programs such as space-based radar, a military space plane, and a new generation of GPS are delayed. A Defense Science Board task force is examining the reasons for problems with planned programs and asking whether the United States is becoming too dependent on space capabilities as an element of its national security strategy. There have been quality control problems and in-orbit failures on a number of communications satellites, and the projected growthproducing segments of the space telecommunications sector are either in bankruptcy or have been cancelled or postponed. Few orders for new commercial communication satellites are being placed. The remote sensing business has yet to establish itself as an engine of commercial space growth. The completion of a fully capable International Space Station remains uncertain as the program’s management approach is revamped, and the U.S. strategy for exploring Mars is in disarray because of changing priorities on the part of its partners. There is a systemic problem in attracting enough good young people to work in the space sector, and the overall space industrial base is in a weakened state. This is hardly the picture of a vibrant, forward-looking area of activity, fully able to be used in support of important national objectives.

## NASA DOD Co-op Module

The plan is the first step in collaboration between NASA and the DOD

Logston 03- John M. Logsdon is Director of the Space Policy Institute of George Washington University’s Elliott School of International Affairs in Washington, DC. “REFLECTIONS ON SPACE AS A VITAL NATIONAL INTEREST” p. 12-15 http://www2.gwu.edu/~spi/assets/docs/space\_as\_a\_national\_interest.pdf

An essential first step is has been suggested above – creating an expectation that performance will match promise. It is the nature of the space sector to attract visionaries excited by the possibility of using space capabilities for purposes ranging from exploring other planets, exploiting new areas of commerce, using extraterrestrial resources to create wealth, opening up Earth orbit and perhaps beyond to widespread public travel, to being a decisive arena for protecting U.S. national security. In putting increased emphasis on “performance as promised,” it is important not to lose the contributions of such visionaries, even though they may be overly optimistic in both their technological and financial estimates. Almost by definition, however, visionaries are seldom in the mainstream of a sector of complex activity. What is needed for the mainstream space actors in both the private sector and government to collaborate in establishing a mutual and continuing relationship of achievable promises and enlightened accountability, one which will provide the firm foundation from which the space sector can earn its central role in the nation’s future. A second step towards a revitalized space sector is a revised investment portfolio, one which recognizes that budgets for space are not likely to increase in the near term, and allocates those resources that are available strategically in order to enable future, improved capabilities. This is easy to say, but hard to do, given the financial demands of current programs. Recently, for example, NASA has had to shift resources from the longer term objective of lower cost access to space to meet the requirements of operating the International Space Station and the space shuttle for the next 15-20 years. The only way that NASA can up significant resources to invest in future-oriented technologies seems to be by reducing its institutional overhead (for example, by closing several of its field centers, a very difficult thing to do politically) or by stopping some of its current activities. Within the Department of Defense, recent organizational changes intended to apply “best practices” from both Air Force and National Reconnaissance Office programs could lead to a more integrated, more productive national security space effort. The return of DARPA to space activity is also a promising development. A third step could be much closer cooperation, and perhaps some degree of integration, among the various government agencies involved in space. NASA was created in 1958 as a separate civilian space agency on political grounds, to show the world that the United States intended to emphasize the peaceful uses of space and to cooperate with other countries in space activities. Those remain valid objectives, but they do not rule out more extensive collaboration between NASA and the Department of Defense in research and technology development activities. There could also be some sort of government-wide organization for common space operations, such as launch ranges, tracking and data relay, in-orbit activities, and other areas where the civilian and national security sectors carry out duplicate functions. Yet another productive initiative would be addressing the vulnerability of current and future space assets to both accidental and deliberate interference with their functioning. Creating an internationally agreed upon set of principles to minimize space debris is essential, and some form of international “rules of the road” for space operations would seem to be desirable. The mission of space control has become associated with using some form of force application to deny potential adversaries access to and use of space, but the space control concept also, and more importantly, includes assuring that the United States can count on its own access and use of space. This aspect of space control, perhaps better called space assurance, should be given increased emphasis. One way of securing the ability of U.S. space assets to operate is by providing some form of space defense capabilities; a potential alternative is a treaty-based “freedom of space operations” regime. Determining whether such a regime can be agreed to is a more

productive task for U.S. diplomats than supporting the current defensive U.S. approach to

discussions of preventing an arms race on outer space

Co-op in the government shifts white house focus to space exploration

Logston 03- John M. Logsdon is Director of the Space Policy Institute of George Washington University’s Elliott School of International Affairs in Washington, DC. “REFLECTIONS ON SPACE AS A VITAL NATIONAL INTEREST” p. 15-16 http://www2.gwu.edu/~spi/assets/docs/space\_as\_a\_national\_interest.pdf

More, and better quality, discussions among advocates of developing a full range of national security space systems, including both defensive and offensive force application capabilities, and those skeptical of the benefits or wisdom of pursuing space weaponization would provide a sounder basis for national policy decisions. To date, most discussions of such issues have not included thoughtful individuals holding a variety of positions. In the U.S. system of developing proposals for policy action, discussions among such individuals and analyses by their organizations are an essential element. To repeat a point that was made earlier, “we lack sound measures of effectiveness and analytic constructs for capturing space's military value today, much less in coming decades.”20 Developing such measures and contructs would provide national leaders a better foundation for the crucial decision on whether to pursue the path towards space weaponization. There does not exist today an adequate foundation for that decision. The sum of these suggestions leads inexorably to the need for some sort of expanded White House focus on space matters, since almost all of them cut across agency jurisdictions and require a national perspective. The current situation, in which the lead staff responsibility for space policy formulation is assigned to a mid-level individual in the National Security Council, assisted by another staff member in the Office of Science and Technology Policy, is an accurate reflection of the existing priority of space issues within the Bush administration. There have be recurring calls for reestablishing the National Space Council. The Aerospace Commission in its recent report reflecting its mandate to address both the aviation and space sectors, suggested that a Bureau of Aerospace Management be created within the White House Office of Management and Budget to “plan, budget, and manage” U.S. aerospace efforts, with a White House Aerospace Policy Coordinating Council serving as the inter-agency forum for policy deliberations. It also suggested that the Congress establish a Joint Committee on Aerospace.21 While implementation of these specific suggestions is unlikely, since they involve major organizational change, they do suggest that advocates of higher priority for space in the United States recognize the need for some central office or structure to provide a space focus at the top level of the U.S. government.

That increases government accountability it’s performance as promised for the government

Logston 03- John M. Logsdon is Director of the Space Policy Institute of George Washington University’s Elliott School of International Affairs in Washington, DC. “REFLECTIONS ON SPACE AS A VITAL NATIONAL INTEREST” p. 7-9 http://www2.gwu.edu/~spi/assets/docs/space\_as\_a\_national\_interest.pdf

Ending the current space malaise is a challenging, but not impossible, task. Fundamental to regaining forward momentum is what political scientist Ronald Brunner described as “performance as promised.”13 Delivering technical, budgetary, and schedule performance as it was promised at the start of a project is a simple enough concept, but difficult of achievement. There are many reasons why the promoters of various space projects are so frequently overly optimistic with respect to technical possibilities, project payoffs, and likely costs and schedules. Basically, their optimism (and perhaps their sense that support will not be forthcoming unless unrealistically high payoffs are predicted) has led them to promise whatever is desired by the people whose approval is needed for a project to be initiated. And, equally important, when the promises are not met, the space sector has too seldom been held accountable, particularly by governments. The kind of market discipline shown over the past few years by the private sector in moving away from space investments is infrequently in evidence in government policy, which is too often driven by parochial political concerns such as local employment impacts or campaign contributions, at the price of performance accountability. If the government followed the private sector lead and shifted its investments away from developing additional space capabilities, the sector certainly would not thrive, at least until it reached a better performance level. Comprehensive and persistent accountability is thus key to performance as promised. If it is put in place and maintained over a period of years, then shortfalls in promised performance will be penalized and excellent performance rewarded. This will take strong government leadership commitment to giving performance priority over short-term politics. Eventually, those leading the space sector will learn that they must be realistic in their promises, and come forward with sound and achievable proposals. If a mutual and continuing relationship of achievable promises and enlightened accountability is developed between project sponsors and project performers, the space sector can in coming years restore its tarnished reputation.

(Insert Terminal Impact to governmental accountability)

## Military Tech Module

Space missile defense causes technological leadership stimulates new technology

Schaffer 03- Bob, former U.S. Senator and Congressman from Colorado former vice chairman of the senate education committee, 10/15/2003, “US Needs Space-Based Missile Defense”, Vital Speeches of the Day Vol. 70, Issue 1, 28-32

Notably, space not only offers a position of advantage for deploying a missile defense, it stimulates the development of new technology. Technological leadership includes the ability to resolve problems. Highlights of where technological leadership has been lacking in the current program for building a **missile** **defense**, include: The termination in 2001 of the Navy Area Wide **defense** program, which would have provided Aegis cruisers and destroyers with a **defense** against short-range ballistic **missiles** and aircraft like PAC-3. While the proposed SM-2 Block VIA interceptor for Navy Area Wide would have relied on a blast fragmentation warhead rather than hit-to-kill, differentiating it from PAC-3, its program termination may be viewed with disappointment. The termination in 2001 and 2002 of the **Space** **Based** Laser program, which would have provided a very effective boost phase **defense** against ballistic **missiles** of all types, short, intermediate, and long-range. Notably, the **Space** **Based** Laser program successfully demonstrated its end-to-end beam generation and training back in 1997. From that point on, the program's next step was to test a scalable high-energy laser in **space**. Presumably, the termination of the **Space** **Based** Laser program came as a result of opposition in the Senate to the deployment of **missile** **defenses** in **space**. Apparently lacking in the current administration was an understanding of the advantages of technological readiness of the **Space** **Based** Laser, unwilling to overcome apparent political opposition at a time when most Americans support **missile** defenses. Technological leadership also includes the ability to communicate the advantages of technology, as well as the ability to develop it. While the current administration has demonstrated its commitment to fund a **missile** **defense** and support the deployment of a ground-**based** **defense**, and has withdrawn from the ABM Treaty, it has yet to support a design to build an effective **defense**, much less insist on technological leadership. America's current plans include a virtual technological regression in any planning for a **space**-**based** interceptor **defense**, unwilling or unable to use past technology developed for Brilliant Pebbles. Unwilling or unable to use Brilliant Pebbles technology for **space**-**based** interceptors, the current administration and the Congress have been unwilling or unable to employ technological advances that have occurred in: The increasing use of robotics, including autonomous operation and data fusing and joint decision making between independently operating robots, which NASA has developed for missions on Mars. The development and increasing use of photonic or fiber optics for sensors, communications, and computer processing, which provide a means to defend against electromagnetic pulse. The development of three-dimensional computer chips, allowing for the integration of different processes, whether computer processing, communications, processing of sensor data, and active response within the same chip. These advances in photonics and computer chips, combined with continuing advances in nanotechnology, including Micro Electro Mechanical Systems or MEMS, could potentially allow for the development of kinetic kill vehicles smaller than Brilliant Pebbles, which were essentially **based** on late 1980's technology. Instead of building kinetic kill vehicles that weigh in the tens of kilograms, the United States could potentially be building kinetic kill vehicles that weigh under a kilogram, perhaps in the tens of grams, approaching the theoretical limits for kinetic kill vehicles suggested by Lowell Wood at Lawrence Livermore when he proposed the idea of Genius Sand as an advance generation Brilliant Pebble. America's defense planners seem to have a striking aversion to the development of advanced technology systems, especially those taking advantage of deployment in space, as seen not only in its termination of the Space Based Laser, but its very low level of funding for the development of a system of space-based relay mirrors that could utilize a high-energy laser to strike at targets around the world. This system of relay mirrors, suggested in the Strategic **Defense** Initiative as a way to take advantage of high energy laser technology that was ground-**based** or air-**based**, is being funded at a level of around $1 million when it should be funded at the billion-dollar level. The state of U.S. technological leadership is also seen by Pentagon planning to deploy a system of optical communication satellites, in other words, satellites using laser communications, which would provide much needed bandwidth and high security. These had been proposed in the early 1980's and the Air Force had performed some early demonstrations.

Space Based missile defense spurs development of new military space tech- space control, surveillance, strike and interdiction, and counter air missions

Aubin and Streland 2k- Dr. Stephen P. Aubin and Major Arnold Streland, phd. Director strategy execution at Raytheon and Col Arnold H. Streland, Commander, TSAT Space Group, MILSATCOM Systems Wing, Space and Missile Systems Center, October 2000 , “The Space-Based Laser Integrated Flight Experiment: Global Missile Defense in the Boost Phase”, Team SBL-IFX, http://www.wslfweb.org/docs/SBLWP.pdf

The Space-Based Laser is the only ballistic-missile, boost-phase intercept system being pursued by the Department of Defense to provide global defense coverage to counter ICBM attacks against the United States or its allies. Like ABL, it will rely on directed energy to destroy missiles shortly after launch. An operational SBL would be the first line of defense against ICBMs launched by an aggressor, and it would complement the capability of the land-based interceptors currently being developed under the National Missile Defense program. An SBL system could provide a robust additional layer to the currently planned missile defense architecture in response to the expected growth of ICBM threats now projected by the intelligence community. If the Space-Based Laser Integrated Flight Experiment (SBL-IFX) is successful, it will provide the technological path for the development of a prototype SBL and, eventually, an operational system sometime around 2020. An operational SBL could also provide strategically significant ancillary capabilities in the area of space control, surveillance and reconnaissance, strike and interdiction, and defensive and offensive counter air missions.

(Terminal Impact)

\*\*\*1AC EMP Advantage\*\*\*

Traditional deterrence fails against an EMP- proliferation to rogue nations, terrorist threat and less of massive retaliation

Spencer 4 – Jack Spencer, Senior Policy Analyst for Defense and National Security in the Kathryn and Shelby Cullom Davis Institute for International Studies at The Heritage Foundation, 8-3-04, “The Electromagnetic Pulse Commission Warns of an Old Threat with a New Face,” The Heritage Foundation, http://www.heritage.org/research/reports/2004/08/the-electromagnetic-pulse-commission-warns-of-an-old-threat-with-a-new-face

Although the threat of a high-altitude EMP attack against America existed during the Cold War, the likelihood may be much greater today.6 During the Cold War, an EMP attack was viewed as the first step in launching a nuclear war. However, it was never tried because the threat of massive nuclear retaliation, the central tenet of the mutual assured destruction doctrine, provided an effective deterrent. Although China and Russia both maintain the ability to launch major nuclear strikes against the United States, the Cold War dynamic that made the doctrine of mutual assured destruction relevant is largely gone from today's strategic calculations. The proliferation of weapons of mass destruction (WMDs), the rise of powerful non-state actors, and the evolving strategic relationships with countries like China and Russia have made the threat more difficult to assess. In reality, the U.S. simply cannot rely on the old tools of deterrence to compel threatening regimes not to attack the United States or its interests. As demonstrated on September 11, 2001, the Cold War deterrent of massive retaliation does not work. The emergence of nuclear rogue states results in a completely new strategic calculation. Since no rogue nation has the capacity to fight a general nuclear war, an EMP blast would not be a precursor of full-scale nuclear war. Furthermore, since an EMP blast is unlikely to kill anyone directly or to be followed by a nuclear strike that would annihilate U.S. cities, the United States is less likely to retaliate and destroy an entire nation of innocent people as punishment for the decisions of a rogue leader. It is simply unclear how the U.S. would respond to such an attack.

Terrorists and rogue nations know about our vulnerability to EMP attacks and have both the desire and the ability to acquire such capabilities and use them to decimate US infrastructure

Shark 7 - Dr. Alan Shark, Executive Director of Public Technology Institute, 9-10-07, “Initial Economic Assessment of Electromagnetic Pulse (EMP) Impact upon the Baltimore-Washington-Richmond Region,” The Sage Policy Group, http://www.survive-emp.com/fileadmin/White-Papers/EMP-Resources/EMP-Econ-Study.pdf

Unfortunately, the public and all too many policymakers still do not understand that rogue states and terrorists are obsessed with obtaining nuclear weapons and EMP capability. They are well aware that if they can credibly threaten or actually execute an EMP attack against the United States that they could destroy the critical infrastructures—electrical power, telecommunications, transportation, food and water—that sustain our civilization. As the EMP Commission warned in their report to Congress: “The highaltitude nuclear weapon generated electromagnetic pulse (EMP) is one of a small number of threats that has the potential to hold our society seriously at risk and might result in the defeat of our military forces….the degradation of infrastructure could have irreversible effects on the country’s ability to support its population.”The EMP Commission found that terrorists could perform an EMP attack. A sophisticated intercontinental ballistic missile is not required to make an EMP attack. The EMP Commission found that a short- or medium-range missile, like a Scud or Iran’s Shahab-3, launched off a freighter, could make an EMP attack on the United States. Iran has practiced such a launch-mode, firing a Scud missile off a vessel in the Caspian Sea.A high-yield nuclear weapon is not necessary to perform an EMP attack that would destroy U.S. critical infrastructures. One of the EMP Commission’s key findings reported to the U.S. Congress is that: “Certain types of relatively low-yield nuclear weapons can be employed to generate potentially catastrophic EMP effects over wide geographic areas, and designs for variants of such weapons may have been illicitly trafficked for a quarter-century.

An EMP would destroy infrastructure in the US causing a collapse of the global economy and sending the world into a new dark age

Carafano and Weitz 10 - James Jay Carafano, Ph.D, Director of the Douglas and Sarah Allison Center for Foreign Policy Studies, and Richard Weitz, Ph.D, Senior Fellow and Director of the Center for Political–Military Analysis at the Hudson Institute, 11-17-2010, “EMP Attacks—What the U.S. Must Do Now” The Heritage Foundation, http://www.heritage.org/Research/Reports/2010/11/EMP-Attacks-What-the-US-Must-Do-Now

An electromagnetic pulse (EMP) attack represents one of the greatest threats imaginable—to the United States and the world. An EMP occurs when a nuclear device is detonated high in the atmosphere—a phenomenon of which America’s enemies are well aware. The electromagnetic discharge can permanently disable the electrical systems that run nearly all civilian and military infrastructures. A massive EMP attack on the United States would produce almost unimaginable devastation. Communications would collapse, transportation would halt, and electrical power would simply be non-existent. Not even a global humanitarian effort would be enough to keep hundreds of millions of Americans from death by starvation, exposure, or lack of medicine. Nor would the catastrophe stop at U.S. borders. Most of Canada would be devastated, too, as its infrastructure is integrated with the U.S. power grid. Without the American economic engine, the world economy would quickly collapse. Much of the world’s intellectual brain power (half of it is in the United States) would be lost as well. Earth would most likely recede into the “new” Dark Ages.

Rogue Nations have large incentives to use an EMP as opposed to a traditional nuclear attack- EMPs are more likely now than ever

Spencer 4 – Jack Spencer, Senior Policy Analyst for Defense and National Security in the Kathryn and Shelby Cullom Davis Institute for International Studies at The Heritage Foundation, 8-3-04, “The Electromagnetic Pulse Commission Warns of an Old Threat with a New Face,” The Heritage Foundation, http://www.heritage.org/research/reports/2004/08/the-electromagnetic-pulse-commission-warns-of-an-old-threat-with-a-new-face

The simple motivation for a rogue state to use its limited nuclear arsenal in an EMP strike against the United States is that an EMP attack maximizes the impact of a few warheads while minimizing the risk of retaliation. This profound decrease in risk for rogue leaders could impel them to use EMP to offset overwhelming U.S. conventional power on the battlefield. While EMP may not precede general nuclear war, it could be used as an opening salvo in a conventional war. Nations with small numbers of nuclear missiles, such as North Korea or Iran, may consider an EMP attack against U.S. forces in a region, to degrade the U.S. military's technological advantage, or against the United States' national electronic infrastructure. Furthermore, an EMP attack using a few nuclear weapons could theoretically damage the entire continental United States, far exceeding the impact of using those same warheads against specific U.S. cities or installations. Likewise, an EMP attack could degrade the U.S. armed forces throughout an entire region. Because America's response to an EMP attack by a rogue state is unclear and because EMP attacks are less risky for rogue states, such attacks are far more likely in this era of nuclear weapons proliferation than during the Cold War.

SBMD is the most effective way to protect from an EMP attack which would destroy electronic infrastructure and create irreversible damage for the US, only boost phase intercept capabilities would solve

Lambakis 7 – Dr. Stephen J. Lambakis, February and March 2007, National security and international affairs analyst specializing in space power and policy studies, “Missile Defense from Space,” The Hoover institution, http://www.gees.org/documentos/Documen-02177.pdf

It is also known that enemies of the United States can put a nuclear weapon over U.S. territory using a ballistic missile. The detonation of this weapon at a high altitude could unleash an electromagnetic pulse that would wipe out satellite and airborne navigation, intelligence, and communications systems and impede any U.S. military response to the aggression. Such a pulse of energy would disable or destroy the unprotected technological infrastructure of a region or the nation. According to the emp Commission, “a regional or national recovery would be long and difficult and would seriously degrade the safety and overall viability of our nation. . . . [A]t some point the degradation of infrastructure could have irreversible effects on the country’s ability to support its population.” Space-based interceptors may be the only effective way to counter this threat and mitigate the effects of an electromagnetic pulse resulting from the intercept. Engaging the missile close to its launch point would release the resulting explosion of gamma rays closer to the attacker’s territory. Relying on an intercept in space, in the midcourse of a missile’s flight, risks damaging unprotected satellites (i.e., just about all commercial and civilian satellites), regardless of who owns them

Boost phase intercept capabilities deter adversaries from launching an EMP attack and are more cost effective than “hardening” all of our infrastructure

Spencer 4 – Jack Spencer, Senior Policy Analyst for Defense and National Security in the Kathryn and Shelby Cullom Davis Institute for International Studies at The Heritage Foundation, 8-3-04, “The Electromagnetic Pulse Commission Warns of an Old Threat with a New Face,” The Heritage Foundation, http://www.heritage.org/research/reports/2004/08/the-electromagnetic-pulse-commission-warns-of-an-old-threat-with-a-new-face

The surest way to protect the United States from a high-altitude EMP is by deploying a ballistic missile defense system that can intercept and destroy a warhead before it could be detonated above the U.S. This would prevent an EMP attack and eliminate any potential harm to U.S. systems, and it could even deter rogue leaders from considering the use of EMP. Deploying a missile defense architecture that can intercept a missile early in flight (during the ascent phase) would render rogue missiles ineffective, thereby undermining the rationale to use them. Moreover, because protecting America's entire civilian electronic infrastructure is not fiscally feasible and because a ballistic missile is the most likely delivery vehicle for an EMP attack, the most prudent method to protect America is a missile defense system that could destroy a ballistic missile before it reaches U.S. airspace.

# \*\*\*Technology\*\*\*

## Uniqueness

China is rapidly expanding technology sectors, it’s a national priority

Lee 11 - Thea Mei Lee, Deputy Chief of Staff American Federation of Labor and Congress of Industrial Organizations, 3-9-11, “China’s Indigenous Innovation Trade and Investment Policies: How Great a Threat?” Testimony before the House committee on foreign affairs, http://foreignaffairs.house.gov/112/lee030911.pdf

The Chinese government has broad industrial and technology strategies aimed at building up its capacity in cutting-edge technology areas across the manufacturing sector. Many of the Chinese government policies include strong incentives designed to attract foreign investment in R&D and production in advanced technology areas, which encourages transfers of U.S. technology and production capacity offshore, including some of the design for civilian technologies with defense applications.i For example, years ago the Chinese government made development of the semiconductor sector a national priority, and has fostered its development with government support for research and development, preferential tax treatment, and the use of the technology standard-setting process to favor its domestic firms.ii They have taken the same approach to the clean energy sector The application of an indigenous innovation procurement policy, with a specific goal of reducing the degree of dependence on technology from other countries from 50 percent to 30 percent or less by 2020, took it a step further. The timing coincided with massive public investments at the height of the economic crisis. Their action made transparent what other government practices on technology transfer had been doing by other means. The result is apparent to some formerly reticent businesses that “have publicly declared that they gradually are being squeezed out of the Chinese market by government policies that first demand technology transfer in exchange for market access and then favor domestic companies.”i

China is moving rapidly from a manufacturing oriented economy to a technology driven one

Su 11 – Ning Su, Assistant Professor, Richard Ivey School of Business The University of Western Ontario, 4-1-11, “China’s Rising Technology Sector,” Asian Business Cases, http://www.asiapacific.ca/sites/default/files/filefield/asia\_cases\_su\_march2011.pdf

Underlying the rapid emergence of Chinese technology firms on the global stage is, in part, China’s national strategy of transforming itself from a manufacturing‐oriented society to a knowledge‐driven economy, an initiative dubbed “From ‘Made in China’ to ‘Innovated in China’ and ‘China Service’”. The global financial crisis which started in 2007 was a catalyst for this transformation: although China’s overall economy remained relatively unscratched during the crisis, the country faced increasing needs to accelerate structural change in its various industries. In particular, several industries have been recognized as strategic to China’s sustained growth and are likely to be given strategic priorities in China’s upcoming twelfth five‐ year plan. These industries include: new energy, clean technology, information technology, and high‐tech manufacturing, among others. The emergence of Chinese technology firms is accompanied by the increasing adoption of new technologies by Chinese firms from a broad range of sectors. In particular, China has been promoting the “synergistic combination of informatization and industrialization”, which refers to the leveraging of IT to modernize domestic businesses, while capitalizing on the maturation of domestic industries to drive thegrowth of technology firms.

China is rapidly advancing its technological sectors, at the expense of the US

Lee 11 - Thea Mei Lee, Deputy Chief of Staff American Federation of Labor and Congress of Industrial Organizations, 3-9-11, “China’s Indigenous Innovation Trade and Investment Policies: How Great a Threat?” Testimony before the House committee on foreign affairs, http://foreignaffairs.house.gov/112/lee030911.pdf

China is no longer just playing catch-up with the United States and the other developed nations regarding basic manufacturing production and technologies. The USCC warned in its 2005 report to Congress that China is developing and producing technology that “is increasing in sophistication at an unexpectedly fast pace. China has been able to leap frog in its technology development using technology and know-how obtained from foreign enterprises in ways other developing nations have not been able to replicate.”iv That 2005 admonition has become a 2011 reality. Since it has become central to the global supply for technology goods of increasing sophistication, China has gained increased leverage in global systems of production.v The AFL-CIO shares the 3 USCC’s concern that this central role raises “the prospect of future U.S. dependency on China for certain items critical to the U.S. defense industry as well as vital to continued economic leadership.”vi The spiraling U.S. trade deficit with China paints a troubling picture of debt and loss of technical and productive capacity.

## Spinnoff Evidence

Space missile defense key to development of new technology- nanotechnology/ technology leadership/ lasers

Schaffer 03- Bob, former U.S. Senator and Congressman from Colorado former vice chairman of the senate education committee, 10/15/2003, “US Needs Space-Based Missile Defense”, Vital Speeches of the Day Vol. 70, Issue 1, 28-32

Notably, space not only offers a position of advantage for deploying a missile defense, it stimulates the development of new technology. Technological leadership includes the ability to resolve problems. Highlights of where technological leadership has been lacking in the current program for building a **missile** **defense**, include: The termination in 2001 of the Navy Area Wide **defense** program, which would have provided Aegis cruisers and destroyers with a **defense** against short-range ballistic **missiles** and aircraft like PAC-3. While the proposed SM-2 Block VIA interceptor for Navy Area Wide would have relied on a blast fragmentation warhead rather than hit-to-kill, differentiating it from PAC-3, its program termination may be viewed with disappointment. The termination in 2001 and 2002 of the **Space** **Based** Laser program, which would have provided a very effective boost phase **defense** against ballistic **missiles** of all types, short, intermediate, and long-range. Notably, the **Space** **Based** Laser program successfully demonstrated its end-to-end beam generation and training back in 1997. From that point on, the program's next step was to test a scalable high-energy laser in **space**. Presumably, the termination of the **Space** **Based** Laser program came as a result of opposition in the Senate to the deployment of **missile** **defenses** in **space**. Apparently lacking in the current administration was an understanding of the advantages of technological readiness of the **Space** **Based** Laser, unwilling to overcome apparent political opposition at a time when most Americans support **missile** defenses. Technological leadership also includes the ability to communicate the advantages of technology, as well as the ability to develop it. While the current administration has demonstrated its commitment to fund a **missile** **defense** and support the deployment of a ground-**based** **defense**, and has withdrawn from the ABM Treaty, it has yet to support a design to build an effective **defense**, much less insist on technological leadership. America's current plans include a virtual technological regression in any planning for a **space**-**based** interceptor **defense**, unwilling or unable to use past technology developed for Brilliant Pebbles. Unwilling or unable to use Brilliant Pebbles technology for **space**-**based** interceptors, the current administration and the Congress have been unwilling or unable to employ technological advances that have occurred in: The increasing use of robotics, including autonomous operation and data fusing and joint decision making between independently operating robots, which NASA has developed for missions on Mars. The development and increasing use of photonic or fiber optics for sensors, communications, and computer processing, which provide a means to defend against electromagnetic pulse. The development of three-dimensional computer chips, allowing for the integration of different processes, whether computer processing, communications, processing of sensor data, and active response within the same chip. These advances in photonics and computer chips, combined with continuing advances in nanotechnology, including Micro Electro Mechanical Systems or MEMS, could potentially allow for the development of kinetic kill vehicles smaller than Brilliant Pebbles, which were essentially **based** on late 1980's technology. Instead of building kinetic kill vehicles that weigh in the tens of kilograms, the United States could potentially be building kinetic kill vehicles that weigh under a kilogram, perhaps in the tens of grams, approaching the theoretical limits for kinetic kill vehicles suggested by Lowell Wood at Lawrence Livermore when he proposed the idea of Genius Sand as an advance generation Brilliant Pebble. America's defense planners seem to have a striking aversion to the development of advanced technology systems, especially those taking advantage of deployment in space, as seen not only in its termination of the Space Based Laser, but its very low level of funding for the development of a system of space-based relay mirrors that could utilize a high-energy laser to strike at targets around the world. This system of relay mirrors, suggested in the Strategic **Defense** Initiative as a way to take advantage of high energy laser technology that was ground-**based** or air-**based**, is being funded at a level of around $1 million when it should be funded at the billion-dollar level. The state of U.S. technological leadership is also seen by Pentagon planning to deploy a system of optical communication satellites, in other words, satellites using laser communications, which would provide much needed bandwidth and high security. These had been proposed in the early 1980's and the Air Force had performed some early demonstrations.

Empirically Space Missile Defense Satelites can be used to explore celestial bodies

German Press Agency 96- German newspaper, December 3, 1996, “Ice on moon increases chance of colonization”, pg. Lexis

The apparent discovery of ice on the lunar south pole increases the chance that man might one day colonize Earth's moon and use it as a refuelling base for space flights, U.S. scientists said Tuesday. That startling prospect comes with news that the moon, once thought to be completely without water, has at least one small frozen lake hidden deep inside a crater, according to data recorded by a U.S. spacecraft. The discovery was made by Clementine, a 226-kilogram craft with sophisticated radar equipment developed during the now abandoned space-based "Star Wars" anti-ballistic missile defence system championed in the 1980s by President Ronald Reagan, Air Force Colonel Pedro Ruston said at the Pentagon. The spacecraft was launched in January 1994 in a joint endeavour by the Defense Department, the U.S. Ballistic Missile Defense Organization and NASA, the U.S. space agency, to test the equipment, but scientists quickly decided in-mission to turn its multi-spectrum radar antenna on lunar craters at both ends of the orb. Ruston, head of the Ballistic Missile Defense Organization, told reporters the "experiment of opportunity" hit pay dirt when it found ice in the moon's South Pole-Aitken basin.

The plan is key to the development of new military technology

Aubin and Streland 2k- Dr. Stephen P. Aubin and Major Arnold Streland, phd. Director strategy execution at Raytheon and Col Arnold H. Streland, Commander, TSAT Space Group, MILSATCOM Systems Wing, Space and Missile Systems Center, October 2000 , “The Space-Based Laser Integrated Flight Experiment: Global Missile Defense in the Boost Phase”, Team SBL-IFX, http://www.wslfweb.org/docs/SBLWP.pdf

The Space-Based Laser is the only ballistic-missile, boost-phase intercept system being pursued by the Department of Defense to provide global defense coverage to counter ICBM attacks against the United States or its allies. Like ABL, it will rely on directed energy to destroy missiles shortly after launch. An operational SBL would be the first line of defense against ICBMs launched by an aggressor, and it would complement the capability of the land-based interceptors currently being developed under the National Missile Defense program. An SBL system could provide a robust additional layer to the currently planned missile defense architecture in response to the expected growth of ICBM threats now projected by the intelligence community. If the Space-Based Laser Integrated Flight Experiment (SBL-IFX) is successful, it will provide the technological path for the development of a prototype SBL and, eventually, an operational system sometime around 2020. An operational SBL could also provide strategically significant ancillary capabilities in the area of space control, surveillance and reconnaissance, strike and interdiction, and defensive and offensive counter air missions.

Plan increases new military tech laundry list A2: ground counterplan- layered defense is good

Aubin and Streland 2k- Dr. Stephen P. Aubin and Major Arnold Streland, phd. Director strategy execution at Raytheon and Col Arnold H. Streland, Commander, TSAT Space Group, MILSATCOM Systems Wing, Space and Missile Systems Center, October 2000 , “The Space-Based Laser Integrated Flight Experiment: Global Missile Defense in the Boost Phase”, Team SBL-IFX, http://www.wslfweb.org/docs/SBLWP.pdf

The best way to counter even a limited number of missiles is through defense in depth. Defense in depth means there will be a number of opportunities to destroy missiles as they are launched and move through the various stages of their flight paths, or trajectories. For National Missile Defense, a land-based, hit-to-kill interceptor is currently being developed to intercept warheads in the middle of their flight paths. There is also discussion and study of using sea-based missile defenses to complement the land-based system. For its part, SBL represents a potential future space-based component of a national missile defense architecture with residual capability that will enhance the planned theater missile defense architecture. Today, theater missile defense is already being pursued in the form of a layered defense. A family of defensive systems will be able to attack short- and medium-range missiles in various stages of their flight. The boost phase, which occurs shortly after a missile is launched, is the first shot defensive systems have at destroying a hostile missile. Presently, the Airborne Laser is the only theater system being developed that will be capable of attacking and destroying a ballistic missile in the boost phase. The boost phase lasts only a few minutes, after which the launcher burns out. The warhead then continues to ascend and travels outside the atmosphere into space during the middle, or mid-course phase, of its trajectory. A typical trajectory looks like an arc. The mid-course comes after boost phase and before the descent phase. It is during the mid-course phase that decoys might be deployed, complicating the defending nation’s ability to intercept the actual warhead. 3 The final phase of a ballistic missile attack occurs when the warhead descends back into the atmosphere toward its target on the ground. Here, in what is also called the terminal phase, the warhead picks up more speed. The critical aspect of an intercept during this final phase is to hit and destroy the warhead before it explodes. It is also important to hit it high enough to avoid any damage from nuclear, chemical or biological debris. The only active defense the United States has deployed today is a slightly upgraded version of the Patriot missile system used in the Gulf War against short-range Scud missiles. This system is not designed to intercept ICBMs, just short-range ballistic missiles. It will be replaced by the PAC-3 Patriot system in 2001, which will be able to intercept short- and medium-range missiles inside the atmosphere during their descent phase, along with cruise missiles. The Navy Area system, based on Aegis cruisers and destroyers, will complement PAC-3, helping to intercept these shorter-range missiles inside the atmosphere.

The plan leads to improvements in the field of astronomy

Pinkerton 01- James K., frequent columnist for fox news fellow at the New America foundation in Washington D.C. Former Columnist for Newsday He worked in the White House domestic policy offices of Presidents Ronald Reagan and George H.W. Bush and in the 1980, 1984, 1988 and 1992 presidential campaigns. In 2008 he served as a senior adviser to the Mike Huckabee for President Campaign, July 16, 2001, “Missile Defense Spinoffs from Outer Space”, http://www.newamerica.net/node/6152

Which is unfortunate, because the unfashionable science they champion has a way of proving itself. In the last few years it's become the conventional wisdom in Washington that missile defense technology is doomed, because, in the popular cliche, "You can't hit a bullet with a bullet." Well, the Pentagon did just that on Saturday night. A projectile, the so-called "kill vehicle," hit a dummy warhead when both were traveling at 4.5 miles per second. Not bad. And while missile defense has a long way to go, the test is a distant early warning to the establishment that the idea might work. As for the astronomers who have been reaping the huge benefits of SDI/NMD, they are not obligated to support missile defense as a form of gratitude for the technogoodies they have received. But as a group, speaking louder than the articulate but lonely voice of Jastrow, astronomers might speak up just a bit. After all, if missile defense technology is good enough for them to use in their stargazing, it might just be good enough to use in defending America.

Space militarization (missile defense) can lead development of ecological tech for colonization

Anker 04- Peder Anker received his PhD in history of science from Harvard University in 1999. He is currently a research fellow at the Center for Development and the Environment at University of Oslo, Norway. His works include Imperial Ecology: Environmental Order in the British Empire, 1895-1945 (Harvard, 2001)., “the Ecological Colonization of Space” Forest History Society and American Society for Environmental History p.239-240 <http://www.jstor.org/stable/3986114>

This article investigates what ecologists sought to do on Mars and what the Martian perspective meant for their understanding of life on Earth. It is a history that originated in military research into constructing self-sufficient closed ecological systems within submarines and underground shelters. In the U.S. space program of the 196os, this know-how was used by leading ecologists to suggest construction of closed ecological systems within space capsules, ships, and colonies. Theirr esearchi nto the ecological "carryingc apacity"f or a given number of astronauts within a spaceship subsequently was used to analyze carrying capacity onboard Spaceship Earth. In the 1970s, environmental ethics became an issue of trying to live like astronauts by adapting space technologies such as bio-toilets, solar cells, recycling, and energy-saving devices to general use. Technology, terminology, and methodology developed for ecological colonization of space became tools for solving environmental problems on Earth. Space colonization caused hardly any controversy until 1975, when royalties from the counterculture sourcebook, The Whole Earth Catalog, were used to finance space-colonization research. In the debate that followed, the overwhelming majority thought space colonies could provide well-functioning environments for astronauts seeking to push human evolutionary expansion into new territories, while also saving a Noah's Ark of earthly species from industrial destruction and possible atomic apocalypse on Earth. To supporters, space colonies came to represent rational, orderly, and wise management, in contrast to the irrational,d isorderlya, nd ill-managedE arth.S ome of them built Biosphere2 in Arizona to prepare for colonization of Mars and to create a model for how life on Earth should be organized. The skeptical minority argued that space colonization was unrealizable or unethical, yet nevertheless adopted terminology, technology, and methodology from space research in their efforts to reshape the social and ecological matrix onboard Spaceship Earth.

Missile defense in space leads to tech in the commercial sector, military force enrichment, and commercial use of tech overlap

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, http://www.ifpa.org/pdf/IWG2009.pdf

Access to a secure space environment is indispensable if the United States is to deploy a robust, layered missile defense. It is essential not only to assure that the United States will be able to use space for missile defense, but also to develop the means to protect other space-based assets and infrastructure. Space has become an arena of crucial importance to the United States both for commercial purposes and for national security. Just as it must maintain capabilities to defend its interests in the air, at sea, and on land, the United States needs to defend its space-based assets. At the same time we must deny the hostile use of space by our enemies. Just as land, the seas, and the air have been conflict arenas, space is changing how wars are fought and where they will be fought. This section addresses the role of space in twenty-first century U.S. national security strategy and its essential contributions to future missile defense. Space offers unique opportunities for a global missile defense. The obstacles to space-based missile defense lie primarily in the political arena rather than in technological limitations. This section examines issues that must be addressed if the United States is to deploy a missile defense that includes space-based interdiction capabilities. Present U.S. Space Strengths The United States is the leading space power, and as such it depends more on space than does any other nation, a situation that leads inevitably to both vulnerabilities and opportunities. The U.S. position in space has grown out of numerous strengths developed over more than five decades. These strengths fall into two broad, overlapping categories: (1) military force enhancement; and (2) commercial utilization of space. Because of the dual-use nature of these technologies, it is not easy to separate their military applications from their commercial ones. Therefore, the failure of the United States to remain in the forefront of space technologies would have both military and commercial implications. Advances in the military or civilian sectors will overlap, intersect, and reinforce each other. Consequently, the development in the United States of a dynamic and innovative private-sector space industry will be indispensable to future U.S. space leadership. Nevertheless, the ability of the U.S. military to contribute to, and benefit from, such a space technology base will depend on its focus and priorities. The availability of technologies does not lead inevitably to their exploitation. America may fail to move forward to exploit technological opportunities and breakthroughs. Such choices may be based on political or other considerations, whether well founded or the product of mistaken assumptions about what competitors or adversaries will or will not do. Just as control of the seas has been essential to the right of innocent passage for commerce, the ability of the United States to maintain assured access to space and freedom of action in space will depend on space control. Given the already extensive importance of space for commercial and military purposes, as well as its prospective role in missile defense, the United States must maintain control of space in the twenty-first century. This commitment to space control is neither new nor destabilizing, despite claims to the contrary. The Security

Environment in Outer Space

Empirical moon landing card- moon landing caused spin-off technology brilliant pebbles likely to do the same- solvency for a change in brilliant pebbles also

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

The Lunar Landing Program began in May 1961 with Kennedy’s daring declaration before a joint session of Congress to land a man on the moon before the end of the decade. With the possible exception of the Manhattan Project, technology had never been so brutally challenged. The world’s first satellite, Sputnik, launched in 1957 and visible to nearly every backyard in America, had flashed a warning that awakened the nation to its vulnerabilities to the Soviet race into space and its nuclear ICBM development efforts. By 1961 competition with the Union of Soviet Socialist Republics (USSR) had become vital to U.S. geopolitical interests.In April, Soviet cosmonaut Yuri Gagarin pulled ahead as the first to orbit the Earth. In May, astronaut Alan Shepard followed with the first U.S. suborbital flight, which was wildly celebrated by the American public. Kennedy took heed and responded three weeks later with his challenge, a stunningly bold move to put the nation ahead in space via the moon. Thus, the political dynamics were in place to drive technology toward a maximum outcome, i.e., taking a supportive role by letting technology determine the outcome. The now two-year-old National Aeronautics and Space Administration (NASA) took the charge with straight-line logic: how to get from here to there and back as efficiently and safely as possible. To achieve this, the Mercury missions were given new challenges, with Gemini following to pioneer new achievements as the bridge to the Apollo moon program. Each phase contributed synergistically to the other components also being worked on, so that the sum of the whole (the lunar landing mission) at any given time was greater than its parts. Spacecraft designs begat new spacecraft designs; guidance systems begat new guidance systems; living one day in space begat 14 days; and on and on into a myriad of thousands of components of human intellect and endeavor, and materiel designs and functions that were all pointed to one declared mission. There were tragic deaths, other dangerous moments, and discouraging failures along the way. There were also hundreds of useful spin-offs that helped to give the United States its commanding lead in technology. But the mission point was never lost and scores of heroes abounded, as on July 20, 1969 – eight years after Kennedy’s challenge – the Eagle landed at Tranquility Base. Of singular significance to this discussion is that throughout the Lunar Landing Program, each component and phase had its own place in the continuity and integrity of the overall mission. Remove one component and the entire mission would fail. Therefore, the program could not be arbitrarily cut in half or more in a Solomon-like gesture and still be expected to succeed. The significance is that the same applied to Brilliant Pebbles; it was cut and it died.2

Military response key to stop assymetrical attack against U.S. space based assets- these develop future technologies

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

The United States must protect its critically important space systems, which are obvious targets for future adversaries who will seek to eliminate the edge those assets give our military forces. This asymmetric U.S. advantage is well known to even limited powers who confront U.S. interests, and they will inevitably strive to reduce that advantage if they seek to attack the United States – and today’s technology makes that possibility a serious concern. Perpetuating the well-known vulnerability of U.S. space assets is, therefore, an unacceptable security risk. The crucial importance of space was clearly highlighted in the early 1990s by the results of the first Gulf War – which the then-Air Force chief of staff, General Merrill McPeak, called the first “space war.”5 More recently, space-based assets, including communications and surveillance systems and sensors, again were essential to the rapid and decisive military victory in Iraq. Operation Iraqi Freedom would have been impossible to conduct with lightning speed and low casualties in the absence of space-based assets providing for unprecedented connectivity among internetted military systems.6 U.S. space systems are also playing a vital role in the current counter-insurgencies in Afghanistan and Iraq. The importance of space systems for the United States and its allies lies in their utter ubiquity throughout the spectrum of conflict at the tactical, operational, and strategic levels of war. The overriding importance of space to our national security was underscored in January 2001 by the “Report of the Commission to Assess United States National Security Space Management and Organization” (the Space Commission) headed by Donald Rumsfeld. How the United States develops space for civil, commercial, defense, and intelligence uses will have profound implications for national security in the next several decades. The commission emphasized that the United States has key national security interests in:

new scientific R&D key to heg technology needs to be better rather than broader

Paarlbarg, 04- Robert L. Professor of Political Science at Wellesley College and Associate at the Weatherhead Center for International Affairs at Harvard University. He received his B.A. in government from Carleton College in Minnesota and his Ph.D. in government from Harvard. He has served as visiting professor of government at Harvard, as a legislative aide in the U.S. Senate, and as an officer in the U.S. Naval Intelligence Command., Summer 2004, “Knowledge as Power Science, Military Dominance, and U.S. Security”, International Security, Volume 29, Number 1, Summer 2004, pp. 122-151 (Article), pg. 122-123

Can the United States maintain its global lead in science, the new key to its recently unparalleled military dominance? U.S. scientific prowess has become the deep foundation of U.S. military hegemony. U.S. weapons systems currently dominate the conventional battlefield because they incorporate powerful technologies available only from scientiªcally dominant U.S. weapons laboratories. Yet under conditions of globalization, scientiªc and technical (S&T) knowledge is now spreading more quickly and more widely, suggesting that hegemony in this area might be difªcult for any one country to maintain. Is the scientiªc hegemony that lies beneath U.S. weapons dominance strong and durable, or only weak and temporary? Military primacy today comes from weapons quality, not quantity. Each U.S. military service has dominating weapons not found in the arsenals of other states. The U.S. Air Force will soon have ªve different kinds of stealth aircraft in its arsenal, while no other state has even one. U.S. airborne targeting capabilities, built around global positioning system (GPS) satellites, joint surveillance and target radars, and unmanned aerial vehicles are dominating and unique.1 On land, the U.S. Army has 9,000 M1 Abrams tanks, each with a ªre-control system so accurate it can ªnd and destroy a distant enemy tank usually with a single shot. At sea, the U.S. Navy now deploys Seawolf nuclear submarines, the fastest, quietest, and most heavily armed undersea vessels ever built, plus nine supercarrier battle groups, each carrying scores of aircraft capable of delivering repeated precision strikes hundreds of miles inland. No other navy has even one supercarrier group Such weapons are costly to build, and the large relative size of the U.S. economy (22 percent of world gross domestic product [GDP]) plus the even larger U.S. share of global military spending (43 percent of the world total in 2002, at market exchange rates) have been key to the development and deployment of these forces. Yet economic dominance and spending dominance would not sufªce without knowledge dominance. It is a strong and rapidly growing S&T capacity that has allowed the United States to move far ahead of would-be competitors by deploying new weapons systems with unmatched scienceintensive capabilities. It was in the middle of the twentieth century that the global arms race more fundamentally became a science race. Prior to World War II, military research and development (R&D) spending absorbed on average less than 1 percent of total major power military expenditures. By the 1980s, the R&D share of major power military spending had increased to 11–13 percent.3 It was precisely during this period, as science became a more important part of military might, that the United States emerged as the clear global leader in science. During World War II, the military might of the United States had come more from its industrial capacity (America could build more) than from its scientiªc capacity (Europe, especially Germany and the United Kingdom, could still invent more). As that war came to an end, however, a fortuitous migration of European scientists to the United States plus wartime research investments such as the Manhattan Project gave the United States the scientiªc as well as the industrial lead.

Specifically redoing brilliant pebbles incentivizes the development of new technologies

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

The Lunar Landing Program began in May 1961 with Kennedy’s daring declaration before a joint session of Congress to land a man on the moon before the end of the decade. With the possible exception of the Manhattan Project, technology had never been so brutally challenged. The world’s first satellite, Sputnik, launched in 1957 and visible to nearly every backyard in America, had flashed a warning that awakened the nation to its vulnerabilities to the Soviet race into space and its nuclear ICBM development efforts. By 1961 competition with the Union of Soviet Socialist Republics (USSR) had become vital to U.S. geopolitical interests.In April, Soviet cosmonaut Yuri Gagarin pulled ahead as the first to orbit the Earth. In May, astronaut Alan Shepard followed with the first U.S. suborbital flight, which was wildly celebrated by the American public. Kennedy took heed and responded three weeks later with his challenge, a stunningly bold move to put the nation ahead in space via the moon. Thus, the political dynamics were in place to drive technology toward a maximum outcome, i.e., taking a supportive role by letting technology determine the outcome. The now two-year-old National Aeronautics and Space Administration (NASA) took the charge with straight-line logic: how to get from here to there and back as efficiently and safely as possible. To achieve this, the Mercury missions were given new challenges, with Gemini following to pioneer new achievements as the bridge to the Apollo moon program. Each phase contributed synergistically to the other components also being worked on, so that the sum of the whole (the lunar landing mission) at any given time was greater than its parts. Spacecraft designs begat new spacecraft designs; guidance systems begat new guidance systems; living one day in space begat 14 days; and on and on into a myriad of thousands of components of human intellect and endeavor, and materiel designs and functions that were all pointed to one declared mission. There were tragic deaths, other dangerous moments, and discouraging failures along the way. There were also hundreds of useful spin-offs that helped to give the United States its commanding lead in technology. But the mission point was never lost and scores of heroes abounded, as on July 20, 1969 – eight years after Kennedy’s challenge – the Eagle landed at Tranquility Base. Of singular significance to this discussion is that throughout the Lunar Landing Program, each component and phase had its own place in the continuity and integrity of the overall mission. Remove one component and the entire mission would fail. Therefore, the program could not be arbitrarily cut in half or more in a Solomon-like gesture and still be expected to succeed. The significance is that the same applied to Brilliant Pebbles; it was cut and it died.2

## 2AC Extensions

Government space programs rely on a narrow technological and industrial base this is unsustainable for budgets

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

Compounding the challenges from abroad is a weakening of the technological and industrial base on which American space power relies. Numerous reviews of U.S. space policy, programs, and budgets over the years have called for altering how space programs are budgeted and managed, changes in how space personnel are trained and the career paths available, and increased investment in research and technology. None of these concerns is new. Troubling signs of a weakening base for American space have been appar26ent for some time. The absence of a peer competitor and the sizeable lead in space capabilities from Cold War-era investments gave policy makers, the public, and even military leaders a false sense of security and reinforced the impression that U.S. leadership would go unchallenged with only minimal attention. Despite the national security importance of space, the United States has not put adequate resources into military space programs. Many of the approximately 100 U.S. national security satellites presently in orbit for military and surveillance operations are approaching obsolescence. Successor-generation models based on new and improved technologies frequently are delayed because they are over budget, behind schedule, and facing technical difficulties. The acquisition process for national security space programs is under severe strain, buffeted by excessive technical and schedule risk and unrealistic cost projections, leading the Defense Science Board to conclude that: “Government capabilities to lead and manage the acquisition process have seriously eroded.”27 The deleterious results of a broken acquisition system are apparent throughout the space sector. The Space-Based Infrared System (SBIRS)-High and the Space Tracking and Surveillance System (STSS) are two cases in point. While both are key parts of the missile defense system to be deployed by the United States, they have had to be restructured because of large cost overruns, schedule delays, and technical problems. For example, SBIRS-High, which is replacing the Defense Support Program (DSP) satellites and will provide rapid early warning and ballistic missile trajectory data, is now projected to cost approximately $10 billion, well over twice the amount of earlier estimates.28 Cost increases in excess of 25 percent during the last quarter of FY 2005 forced the Pentagon to recertify the program in December 2005. For FY 2009, DoD requested $2.3 billion for the program, though the Air Force is currently exploring a potential alternative or early replacement for SBIRS-High called 3GIRS.29

No talented workers in the government space programs now. Mismanagement private sector will increase the scope and intensity of programs drawing a wider research base.

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

The Rumsfeld Space Commission warned that the United States was not developing the military space cadre needed in the years ahead; a conclusion subsequently reinforced by the Walker and Allard Commissions.35 The aging aerospace workforce, bleak prospects for the growth of the space market, and uncertain career paths for military personnel have drained talented workers, scientists, engineers, and managers from the space sector. Additionally, the Allard Commission highlights the limitations of the current system of managing military space programs. In summary, the ability to threaten the United States in space will only grow in the years ahead. Small nations, as well as groups or even individuals, are increasingly able to acquire technologies and knowledge that could disrupt or destroy space systems and ground facilities. The United States could be surprised by the speed with which such capabilities are acquired by its enemies and by the rate in which its own capabilities decline. Such adversaries, especially if they are rogue states or terrorist groups, are unlikely to be bound by international agreements or global norms against the weaponization of space. Commercial Activity in Space Space has become an essential part of daily life. This includes satellites that transmit television images, provide weather forecasting data, emergency response, the infrastructure for the internet, the mapping of the Earth’s surface, and global positioning information. Space technologies are transforming the process by which we conduct business and undertake research. The net result is greater productivity with important implications for economic growth, prosperity, and innovation. Access to space-based assets is essential for a broad range of private-sector activities, which will increase both in scope and intensity as a result of the emergence of technologies including smaller satellites and cheaper boosters, miniaturization, and greater economies of scale. The space infrastructure originally established with government funding has furnished the basis for both military and commercial applications. In the years ahead, the commercial sector is likely to provide innovative impetus that spills over into the military arena. By the mid-1990s, global commercial revenues from space resulting from the rapid expansion of consumer services such as telecommunications and television were greater than the aggregate of government spending on space. In 2007 alone, spending on commercial space infrastructure, infrastructure support industries, and commercial satellite services (including direct-to-home television and GPS) totaled approximately $174 billion, accounting for nearly 70 percent of total global space spending. Alongside increased November 2002, http://www.aia-aerospace.org/pdf/commission\_report2.pdf; and Amy Butler, “Panel Wants Massive Milspace Reshuffling,” Aviation Week and Space Technology, August 14, 2008, (as of November 12, 2008).commercial spending on space, government space budgets have accounted for a steadily decreasing percentage of global space spending. In the past two years alone, the governmental share of global space spending has slipped by 8 percentage points, from 39 percent of global space spending in 2005 to 31 percent in 2007. Over the same period of time, aggregate government spending on space actually increased by $8.25 billion. The fact that government’s share of space spending decreased 8 points in spite of a 12 percent boost in spending further underscores the impressive growth of the commercial space sector.36 This means that governments will have less control over access to such services as high-resolution imagery of the Earth’s surface, which can be used for civilian or for military purposes. Growing commercialization of space will make such access more widely available as commercial investment in space technologies increases relative to that of governments.

The plan breaks down the wisdom that missile defense tech is doomed

Pinkerton 01- James K., frequent columnist for fox news fellow at the New America foundation in Washington D.C. Former Columnist for Newsday He worked in the White House domestic policy offices of Presidents Ronald Reagan and George H.W. Bush and in the 1980, 1984, 1988 and 1992 presidential campaigns. In 2008 he served as a senior adviser to the Mike Huckabee for President Campaign, July 16, 2001, “Missile Defense Spinoffs from Outer Space”, http://www.newamerica.net/node/6152

Which is unfortunate, because the unfashionable science they champion has a way of proving itself. In the last few years it's become the conventional wisdom in Washington that missile defense technology is doomed, because, in the popular cliche, "You can't hit a bullet with a bullet." Well, the Pentagon did just that on Saturday night. A projectile, the so-called "kill vehicle," hit a dummy warhead when both were traveling at 4.5 miles per second. Not bad. And while missile defense has a long way to go, the test is a distant early warning to the establishment that the idea might work. As for the astronomers who have been reaping the huge benefits of SDI/NMD, they are not obligated to support missile defense as a form of gratitude for the technogoodies they have received. But as a group, speaking louder than the articulate but lonely voice of Jastrow, astronomers might speak up just a bit. After all, if missile defense technology is good enough for them to use in their stargazing, it might just be good enough to use in defending America.

Specifically redoing brilliant pebbles incentivizes the development of new technologies

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The Lunar Landing Program began in May 1961 with Kennedy’s daring declaration before a joint session of Congress to land a man on the moon before the end of the decade. With the possible exception of the Manhattan Project, technology had never been so brutally challenged. The world’s first satellite, Sputnik, launched in 1957 and visible to nearly every backyard in America, had flashed a warning that awakened the nation to its vulnerabilities to the Soviet race into space and its nuclear ICBM development efforts. By 1961 competition with the Union of Soviet Socialist Republics (USSR) had become vital to U.S. geopolitical interests.In April, Soviet cosmonaut Yuri Gagarin pulled ahead as the first to orbit the Earth. In May, astronaut Alan Shepard followed with the first U.S. suborbital flight, which was wildly celebrated by the American public. Kennedy took heed and responded three weeks later with his challenge, a stunningly bold move to put the nation ahead in space via the moon. Thus, the political dynamics were in place to drive technology toward a maximum outcome, i.e., taking a supportive role by letting technology determine the outcome. The now two-year-old National Aeronautics and Space Administration (NASA) took the charge with straight-line logic: how to get from here to there and back as efficiently and safely as possible. To achieve this, the Mercury missions were given new challenges, with Gemini following to pioneer new achievements as the bridge to the Apollo moon program. Each phase contributed synergistically to the other components also being worked on, so that the sum of the whole (the lunar landing mission) at any given time was greater than its parts. Spacecraft designs begat new spacecraft designs; guidance systems begat new guidance systems; living one day in space begat 14 days; and on and on into a myriad of thousands of components of human intellect and endeavor, and materiel designs and functions that were all pointed to one declared mission. There were tragic deaths, other dangerous moments, and discouraging failures along the way. There were also hundreds of useful spin-offs that helped to give the United States its commanding lead in technology. But the mission point was never lost and scores of heroes abounded, as on July 20, 1969 – eight years after Kennedy’s challenge – the Eagle landed at Tranquility Base. Of singular significance to this discussion is that throughout the Lunar Landing Program, each component and phase had its own place in the continuity and integrity of the overall mission. Remove one component and the entire mission would fail. Therefore, the program could not be arbitrarily cut in half or more in a Solomon-like gesture and still be expected to succeed. The significance is that the same applied to Brilliant Pebbles; it was cut and it died.2

2. Impacts

1. Competitiveness Space Commercialization low now because NASA is focusing on the mundane aspects of space exploration the plan frees up space for NASA resources

Stern 10 - S. Alan Stern, NASA's former associate administrator in charge of science, is the chairman of the Commercial Spaceflight Federation's Suborbital Applications Researchers Group., May 17 “Let business handle routine spacefaring; NASA can handle the otherwordly missions” B, COMMENTARY; Pg. 3, http://www.washingtontimes.com/news/2010/may/17/let-business-handle-routine-sp/?page=all

NASA is spending too much of its precious budget on providing routine transport of astronauts to the space station, stymying progress on its more important task of sending astronauts to explore deep space. Fortunately, the administration has proposed a game-changing solution that uses cost-effective private industry to take on the more mundane aspects of human transportation to low-Earth orbit, freeing up needed funds to send astronauts to explore deep space. The administration's wise commercialization approach echoes an immensely successful path taken by NASA in the past. Consider: At the dawn of the space age, all satellites were built and launched by governments. But very early on, communications satellites were encouraged to go commercial. The result: a $100-plus billion spinoff industry that employs thousands of workers to build the satellites, their ground stations, launchers and associated command and control infrastructure, and launches more satellites annually than any other form of space flight. That has opened up NASA resources to do other things with the money saved. But equally importantly, the commercialization of space communications has also generated tens of thousands of direct and indirect private sector jobs, and a strong innovation cycle that's produced continuous improvement across the industry for more than four decades. In contrast, nearly 50 years after the first human flights to orbit by Yuri Gagarin and John Glenn, no commercial human spaceflight yet exists. Few in our parents' generation would have believed this, for at the outset of the space age, the commercialization of human transport to low-Earth orbit was widely expected. Remember the Pan Am shuttle in "2001: A Space Odyssey"? Why has the commercialization of human transport to low-earth orbit been stymied? Are the complexities of communication satellites and commercial human transport really so different? Not fundamentally. Are governments the only entities that can build human spacecraft? No, actually every human spacecraft ever built for NASA was built by private industry. Is the scope of the investment required for human spaceflight too large for private industry? No - large satellite constellations cost more than the commercial crew systems envisioned to take astronauts to and from low-Earth orbit. Of course, there are human lives at stake in space missions with crew, but commercial firms have lives at stake in industries as diverse as trucking, oil exploration, aviation and nuclear power. Why should space travel to destinations closer than most transcontinental airline flights be considered so different? In fact, there really is no fundamental reason that human orbital transport to low-Earth orbit must remain the practice only of governments a full half-century after it began. To the contrary, there are many reasons that the development of private, commercial human space flight vehicles in the United States is desirable for the nation. These include: \* Competition-driven innovation and price pressure that commercial practices foster can only make human space flight ever-more common, and U.S. leadership in this domain ever clearer. \* The spinoff development of related commercial companies supporting space tourism, orbital research stations and future applications pregnant with economic promise for aerospace industry and the United States. \* The generation of thousands of new, high-paying jobs across the U.S. to support commercial space lines. \* And the inherent robustness that comes with having a diverse suite of U.S. manned spaceflight systems to access space. It is only by freeing up NASA from routine human transport to low-Earth orbit that we can afford to once again see American astronauts exploring distant worlds. For this reason, if Congress doesn't adopt the administration's more economical, commercial crew to low-Earth orbit strategy, there is little chance we - rather than the Chinese, Russians and Indians - will be exploring worlds and making history in space in the future. What are we waiting for?

missile defense has led to three major spinoffs piezoelectrics, adaptive optics, and inferometer

Pinkerton 01- James K., frequent columnist for fox news fellow at the New America foundation in Washington D.C. Former Columnist for Newsday He worked in the White House domestic policy offices of Presidents Ronald Reagan and George H.W. Bush and in the 1980, 1984, 1988 and 1992 presidential campaigns. In 2008 he served as a senior adviser to the Mike Huckabee for President Campaign, July 16, 2001, “Missile Defense Spinoffs from Outer Space”, http://www.newamerica.net/node/6152

Jastrow, an astronomer who has been a leading figure in missile defense matters for decades, offered three more examples of the value that NMD has spun off onto his own academic discipline. First, piezoelectrics. Piezoelectric substances, typically crystals and quartzes, can be mechanically deformed by the application of electricity. Telescope lenses, for example, can be made infinitely malleable; piezoelectricity enables computers to manipulate lenses to compensate for refractions in the atmosphere, allowing an ultra-clear picture. This acuity was a critical objective for strategic defensers as they struggled to find ways to identify incoming objects, such as missiles; the U.S. government, Jastrow said, spent about $500 million on this effort. But the costly fruits of those efforts have been declassified now, and the spinoff has given new life to terrestrial telescopes, which were once thought to be on their way to obsolescence because of increased interference in the atmosphere. Jastrow, whose Mt. Wilson Observatory is in the thick of Los Angeles "light smog," said proudly, "Mt. Wilson now produces images that are as sharp as the Hubble Space Telescope." Second, adaptive optics. The idea here, Jastrow explained, is to use light as a tool to help see light. Does that sound counterintuitive? So are many things in science. But as DDPers like to say, the glory of the scientific method is that it is based on objectivity, not subjectivity. Objectivity offers even crackpots, or seeming crackpots, a chance to prove that their wild theory is, in fact, true. And in the case of adaptive optics (AO), the vindicated visionary was Laird Thompson of the University of Illinois. AOers started out using the light from a single bright natural star as a benchmark, to correct for atmospheric perturbations. Once again, strategic defensers jumped on the idea as yet another way to identify incomings. Now Thompson and others, riding on the cushion of intellectual capital that Uncle Sam helped pay for, are going further, using lasers as the benchmarking light source, so as to see even further into deep space. Third, the inferometer. This is yet another astronomical technology juiced by missile money, Jastrow told his listeners. It allows scientists to get a better look at a single astronomical object through multiple telescopes, all computer calibrated for maximum resolution. Astronomers at Georgia State University, for instance, are using six telescopes spread out over a mile to get the space equivalent of a Kodak moment. Inferometers could help unravel one of the great mysteries of the universe, the formation of planets. Astronomers are looking, for example, at 3 Juno, a 200-mile-wide asteroid not far from Earth, whose name derives from its status as the third asteroid ever discovered, by the astronomer Karl Harding, back in 1804. Today's astronomers believe that planets came into being in part because they are the cumulative product of various inter-stellar collisions; they wonder whether 3 Juno is such a planet-in-progress. The inferometer is helping test this hypothesis.

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2. Colonization NASA looking to buy tech from private companies including a lunar vehicle

Warwick 04- Graham, Aerospace and technology journalist Graham Warwick, winner of the 2002 AJOYA Decade of Excellence Award in 2002 and most recently a director of Flight International's coverage of the Americas has 30 years of industry experience at Flight International, September 14, 2004, “Agencies seek commercial input; NASA and ESA want to obtain innovative technologies from small private-sector companies and entrepreneurs” Flight International News; Spaceflight; Pg. 27 http://www.flightglobal.com/articles/2004/09/14/187391/agencies-seek-commercial-input.html

Space organisations are moving to engage entrepreneurial and non-traditional companies in a bid to gain access to innovative commercial technologies. NASA plans to create a venture-capital fund to sponsor new technologies, while the European Space Agency has launched an initiative aimed at fostering the participation of smaller companies in space technology programmes. NASA's Mercury Fund plans to join with established private-sector venture capital firms to invest in young, privately held companies working on nanotechnology, robotics, intelligent systems and high-speed networks. The concept is similar to the US Central Intelligence Agency's government-backed venture capital fund, In-Q-Tel, which has taken strategic stakes in some 67 firms since being created in 1999. ESA, meanwhile, has issued an invitation to tender aimed specifically at small and medium-sized enterprises (SMEs), particularly those not yet involved in space programmes. The agency is looking for innovations by companies active in fields other than space that can be used in renewing its technology base. Under the Leading Edge Technology for SMEs programme, smaller firms will carry out feasibility studies or preliminary validations to demonstrate application of their technologies to space programmes. ESA has invited proposals in areas including design and engineering tools, inflatable structures, small electric thrusters and "green" rocket engines. ESA plans to award multiple 18-month, [euro]50,000--200,000 ($60,000--$240,000) contracts. Under pressure to give the private sector a role in its space exploration programme, NASA has included several smaller companies among those awarded contracts to study preliminary concepts for human lunar missions. One of these, Transformational Space (t/Space), is proposing that private industry builds and owns the lunar infrastructure and NASA buys services to support its explorers. The t/Space team includes Scaled Composites, developer of the SpaceShipOne private-venture suborbital vehicle, and AirLaunch, which is designing a low-cost, air-dropped Quickreach launch vehicle. The two companies will collaborate on designing a crew exploration vehicle that can be developed affordably by private industry. Another team member is Constellation Services International, which is developing the LEO Express concept for low-cost cargo resupply and satellite servicing.

No Lunar Development now several barriers

Sadeh et al. 05- Eligar Sadeh, David Livingston, Thomas Matula, Haym Benaroya, a Department of Space Studies, University of North Dakota, Grand Forks, ND 58202-9008, USA b Department of Space Studies, University of North Dakota, USA c School of Business, University of Houston-Victoria, USA d Department of Mechanical and Aerospace Engineering, Rutgers University, USA, Available online 13 October 2005, “Public–private models for lunar development and commerce”, Space Policy 21 (2005) 267–275

Mission concepts and plans directed at lunar base development have been proposed since the beginning of the Space Age. In January 2004, a new US civil space policy was announced based on space development to support robotic and human space exploration of the Moon, then Mars. Previous concepts and plans for lunar development, including the 2004 policy, have remained either on the political agenda or as proposed ideas for the commercial sector. Given that this has been the case, why has there not been political formulation and implementation of lunar base missions or implementation of commercial development of the Moon? This paper assesses the issues facing those in both the public and private sectors who view lunar development as a desirable goal and offers suggestions, based on partnerships between the public and private sectors in the USA, on how to make that goal a reality. Public–private partnerships (PPPs) depend on how the government reduces risks for the private sector. Identified and discussed herein are political, legal, financial, market and technical risks. There are several issues that have entrapped lunar development ideas on bothth e political and business agendas. First, an environment of uncertainty concerning political and legal regimes constrains the prospects for commercial sector interest in lunar development. Second, public policy evolves on an incremental basis. Past policies and practices change slowly and usually in response to a particular crisis or focusing event that warrants public attention. Third, lunar development advocates focus on scientific and technological benefits of lunar development, while providing weak links to economic competitiveness and national security issues that are of interest to political decision makers. Arguments for lunar development based on unspecified technological spin-offs are ineffective. Political rationales in support of lunar development are constrained because of weak public support for space in general and to reduced budgets and downsizing in government support for researchand development (R&D). Fourth, even though lunar commerce enjoys a prestige status in the private sector (numerous companies have plans to carry out commercially viable robotic ventures on the Moon), plausible business plans for lunar settlement, catering to scientific, mining and tourism projects, remain elusive and in the more distant future. The business plans that have been proposed for lunar settlement lack realistic return on investment (ROI) calculations to make the venture attractive to capital markets. These plans fail to properly identify and quantify sustainable long-term markets for the proposed ventures. Partnerships between the public and private sectors are essential to deal withth ese issues and to enable prospects for lunar development. The idea of PPPs implies the existence of political support and government funding, and aspects in the lunar development that would attract investor interest and private capital. The issue to be discussed here is how to fashion a synergistic PPP relationship. To this end, there are a number of important factors that cut across the political, legal, financial, market and technical risks inherent in the formulation and implementation of PPPs for lunar development. These factors concern the roles of governments, technology, and the private sector in the PPP equation. The roles related to each of these factors are analyzed below.

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\*\*\*Leadership\*\*\*

## Leadership Key

Missile leadership is key to the creation of new technologies like robotics and better lasers

Schaffer 03- Bob, former U.S. Senator and Congressman from Colorado former vice chairman of the senate education committee, 10/15/2003, “US Needs Space-Based Missile Defense”, Vital Speeches of the Day Vol. 70, Issue 1, 28-32

Building an effective **missile** **defense** requires the United States to deploy its kinetic kill interceptors in **space** like Brilliant Pebbles, not in underground concrete **missile** silos. An intelligent design would utilize the advantages that deployment in space offers in providing global coverage, boost-phase interception, the use of robotics, minimal operational costs, and the ability to use high-energy lasers for boost phase interception and active discrimination of decoys. There is a third ingredient for building an effective missile defense. This ingredient is technological leadership, including the ability to manage programs involving technology to produce timely results. Good leadership needs to manage the effort to build a missile defense effectively, to produce timely results rather than create an endless cycle of studies, delays, testing, and indecision. In the past the United States has exhibited bursts of technological leadership, including President Reagan's Strategic **Defense** Initiative, which supported a vast program of research and development for **missile** **defense** technology.

Space Based better than land based. Key to a layered defense

Schaffer 03- Bob, former U.S. Senator and Congressman from Colorado former vice chairman of the senate education committee, 10/15/2003, “US Needs Space-Based Missile Defense”, Vital Speeches of the Day Vol. 70, Issue 1, 28-32

For this reason U.S. military strategy emphasizes air superiority, the high ground of combined air, land, and sea operations. There is also the high ground of space, which U.S. military forces recognize as vital to the operation of our intelligence, communications, reconnaissance, and navigation systems, which rely heavily on satellites. Building an effective missile defense also requires good position. But this position isn't found on the ground, it is found in space where the ballistic missile operates. Building an effective missile defense requires a strategy that deploys a missile defense in the high ground of space. Good leadership would deploy a **missile** **defense** in **space**. Good leadership would point the way to **space**. Both the Strategic **Defense** Initiative of the 1980's and early 1990's and Project Defender of the later 1950's and early 1960's pointed the way to **space**, recognizing the inherent advantages of deploying a **missile** **defense** in **space**. The earlier Project Argus nuclear test shots in 1958 and Starfish 1962 also pointed to **space**. Dr. Nicholas Christofilos from Lawrence Livermore realized **space** provides a position with global coverage against ballistic **missile** threats. The strategic advantages of deploying a missile defense in space are considerable. Global coverage, the capability for boost-phase interception, the use of robotics minimizing operational costs, and the potential of high-energy lasers and particle beams led these earlier missile defense programs to emphasize the development of defenses based in space. Even the Clinton administration was aware of the advantages that accrue from deployment of a **missile** **defense** in **space**, as seen in its decision to complete the termination of the Brilliant Pebbles program for deploying a **space**-**based** interceptor **defense**, and attempt to terminate the **Space** **Based** Laser.

Space Based missile defense gives the means to protect other space infrastructure

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, http://www.ifpa.org/pdf/IWG2009.pdf

Access to a secure space environment is indispensable if the United States is to deploy a robust, layered missile defense. It is essential not only to assure that the United States will be able to use space for missile defense, but also to develop the means to protect other space-based assets and infrastructure. Space has become an arena of crucial importance to the United States both for commercial purposes and for national security. Just as it must maintain capabilities to defend its interests in the air, at sea, and on land, the United States needs to defend its space-based assets. At the same time we must deny the hostile use of space by our enemies. Just as land, the seas, and the air have been conflict arenas, space is changing how wars are fought and where they will be fought. This section addresses the role of space in twenty-first century U.S. national security strategy and its essential contributions to future missile defense. Space offers unique opportunities for a global missile defense. The obstacles to space-based missile defense lie primarily in the political arena rather than in technological limitations. This section examines issues that must be addressed if the United States is to deploy a missile defense that includes space-based interdiction capabilities. Present U.S. Space Strengths The United States is the leading space power, and as such it depends more on space than does any other nation, a situation that leads inevitably to both vulnerabilities and opportunities. The U.S. position in space has grown out of numerous strengths developed over more than five decades. These strengths fall into two broad, overlapping categories: (1) military force enhancement; and (2) commercial utilization of space. Because of the dual-use nature of these technologies, it is not easy to separate their military applications from their commercial ones. Therefore, the failure of the United States to remain in the forefront of space technologies would have both military and commercial implications. Advances in the military or civilian sectors will overlap, intersect, and reinforce each other. Consequently, the development in the United States of a dynamic and innovative private-sector space industry will be indispensable to future U.S. space leadership. Nevertheless, the ability of the U.S. military to contribute to, and benefit from, such a space technology base will depend on its focus and priorities. The availability of technologies does not lead inevitably to their exploitation. America may fail to move forward to exploit technological opportunities and breakthroughs. Such choices may be based on political or other considerations, whether well founded or the product of mistaken assumptions about what competitors or adversaries will or will not do. Just as control of the seas has been essential to the right of innocent passage for commerce, the ability of the United States to maintain assured access to space and freedom of action in space will depend on space control. Given the already extensive importance of space for commercial and military purposes, as well as its prospective role in missile defense, the United States must maintain control of space in the twenty-first century. This commitment to space control is neither new nor destabilizing, despite claims to the contrary. The Security

Environment in Outer Space

## AT: Space Leadership inevitable

Logston 03- John M. Logsdon is Director of the Space Policy Institute of George Washington University’s Elliott School of International Affairs in Washington, DC. “REFLECTIONS ON SPACE AS A VITAL NATIONAL INTEREST” p. 7 http://www2.gwu.edu/~spi/assets/docs/space\_as\_a\_national\_interest.pdf

The basic confidence that the sector can deliver on to its claims has been badly shaken over the past few years. Unless the space community reverses recent negative trends and uncertainties, understands why it has a credibility problem, and takes steps to regain the confidence of those that provide its funds, its ever taking a more central role in support of U.S. interests could be threatened. There is nothing inevitable about national leadership giving space capabilities a central role in the U.S. economy or military planning; that position must be earned.

## Political Will Key

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There is a certain chicken-and-egg character to the call for a centralized space policy structure. It seems such a structure would be necessary to manage the government’s role in the space sector as a “vital national interest,” but is unlikely to be established until the President and his associates assign that status to the sector in practice as well as rhetoric. The Commission to Assess United States National Security Space Management and Organization recommended that “The President should consider establishing space as a national security priority.”22 This is not yet happened, of course. One possible path towards an increased priority for space within the White House has negative overtones. If for some reason the United States lost some portion of its access to space or its ability to use an important space capability, that development might dramatize the crucial role of space in support of national objectives and interests. Short of such a development, it will take the recognition by the President or one of his senior advisers of the importance of space to initiate needed organizational changes. Taking steps such as those just suggested will require acts of will from all involved, since none are easy to carry out. What has been most missing in the space sector over the past three decades is precisely the national will to excel, and to tap the potentials of space for their maximum contribution to the nation. When President John F. Kennedy on May 25, 1961 asked the Congress to approve his decision to send Americans to the moon, he said: “Let it be clear that I am asking the Congress and the country to accept a firm commitment to a new course of action.” He added to his prepared text: “This is the choice and finally you and the American public must decide.”23 The national will to accept the Apollo commitment did emerge and was sustained through the July 1969 first lunar landing. It took a challenge by the U.S. Cold War adversary, the Soviet Union, to catalyze this expression of national will. It is not clear what can provide a similar catalyst today, but without it the most likely future is continuation of the “lethargy” pointed out by the Aerospace Commission. The Aerospace Commission report notes that “Japan, China, Russia, India and France, to name a few, see space as a strategic and economic frontier that should be actively pursued.” It adds “So should we.”24 Whether an international challenge to U.S. space leadership is either likely or sufficient to produce an Apollo-like response is debatable

## Space Leadership low

Thinning out bureaucracy is key to government support the private industry

New York Times 04- WARREN E. LEARY and JOHN SCHWARTZ staff writers, June 14 “NASA Is Urged To Widen Role For Businesses” Section A; Column 5; National Desk; Pg. 1, http://www.nytimes.com/2004/06/15/us/nasa-is-urged-to-widen-role-for-businesses.html

NASA needs to thin out its bureaucracy and turn over many tasks to private industry if the agency is to carry out President Bush's new vision to explore the Moon and Mars, a presidential commission has concluded. The panel, the President's Commission on Moon, Mars and Beyond, which spent months considering how to reach goals outlined by Mr. Bush in a January speech, said the venture would require huge changes within NASA and steady commitment from government. ''The commission unanimously endorses this ambitious yet thoroughly achievable goal of space exploration,'' the panel said in a report to be issued Wednesday. ''Our journey will require the government to embrace fundamental changes in its management and organization.'' The panel also recommended restoring an advocate for space programs at the White House by creating a Space Exploration Steering Council. A similar council existed under the first President Bush but disbanded with his administration. Details of the report were first disclosed by Space.com, an Internet site specializing in space issues; a summary of the report was obtained by The New York Times. It said NASA should make itself a leaner organization that concentrates on research and developing space technology that is not readily available. Any technology or services useful to the space program that are available from private industry should be contracted out, it said. The agency should encourage private industry ''to assume the primary role of providing services to NASA,'' the report said -- leaving it to industry to launch most payloads into low orbit around the Earth, for instance. ''In NASA decisions, the preferred choice for operational activities must be competitively awarded contracts with private and nonprofit organizations,'' it said. ''NASA's role must be limited to only those areas where there is irrefutable demonstration that only government can perform the proposed activity.'' Increased commercialization is crucial, the panel said, ''to attainment of exploration objectives within reasonable schedules and affordable costs.''

The government will look for innovation in the private sector to solve bureaucracy the government doesn’t want another Apollo program

New York Times 04- WARREN E. LEARY and JOHN SCHWARTZ staff writers, June 14 “NASA Is Urged To Widen Role For Businesses” Section A; Column 5; National Desk; Pg. 1, http://www.nytimes.com/2004/06/15/us/nasa-is-urged-to-widen-role-for-businesses.html

The NASA administrator, Sean O'Keefe, has repeatedly suggested that NASA should get out of the business of doing things in low Earth orbit and should be focusing its financing and goals instead on exploration beyond the home planet. Mr. O'Keefe said last week that the agency would take the commission's work seriously and expected to adopt many of its recommendations. NASA is already studying a reorganization, which according to draft documents would combine several departments within the agency and reduce the size of its bureaucracy. Howard E. McCurdy, a space expert at American University, said that at first blush, the commission might seem to be endorsing what had been happening to a great extent at NASA, with contractors already doing a good deal of the work at the agency. Within the space shuttle program, Professor McCurdy said, the main contractor, United Space Alliance, and other companies ''don't sit in the front room at mission control, but they do just about everything else.'' Still, if the space program was restructured as the commission suggests, NASA would be looking to entrepreneurs for more innovation and creativity as well, he said. And that, he said, would mean an utterly transformed space agency. ''It's not going to be some huge Project Apollo that will get us back to the Moon,'' he said. That program cost an estimated $150 billion in current dollars, he said -- a price that America is unlikely to pay.

## Leadership Solvency

Historically military research has led to the development of ecological research about space colonization

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This article investigates what ecologists sought to do on Mars and what the Martian perspective meant for their understanding of life on Earth. It is a history that originated in military research into constructing self-sufficient closed ecological systems within submarines and underground shelters. In the U.S. space program of the 196os, this know-how was used by leading ecologists to suggest construction of closed ecological systems within space capsules, ships, and colonies. Theirr esearchi nto the ecological "carryingc apacity"f or a given number of astronauts within a spaceship subsequently was used to analyze carrying capacity onboard Spaceship Earth. In the 1970s, environmental ethics became an issue of trying to live like astronauts by adapting space technologies such as bio-toilets, solar cells, recycling, and energy-saving devices to general use. Technology, terminology, and methodology developed for ecological colonization of space became tools for solving environmental problems on Earth. Space colonization caused hardly any controversy until 1975, when royalties from the counterculture sourcebook, The Whole Earth Catalog, were used to finance space-colonization research. In the debate that followed, the overwhelming majority thought space colonies could provide well-functioning environments for astronauts seeking to push human evolutionary expansion into new territories, while also saving a Noah's Ark of earthly species from industrial destruction and possible atomic apocalypse on Earth. To supporters, space colonies came to represent rational, orderly, and wise management, in contrast to the irrational,d isorderlya, nd ill-managedE arth.S ome of them built Biosphere2 in Arizona to prepare for colonization of Mars and to create a model for how life on Earth should be organized. The skeptical minority argued that space colonization was unrealizable or unethical, yet nevertheless adopted terminology, technology, and methodology from space research in their efforts to reshape the social and ecological matrix onboard Spaceship Earth.

Military space technology is helping war efforts in Afghanistan and Iraq

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The United States must protect its critically important space systems, which are obvious targets for future adversaries who will seek to eliminate the edge those assets give our military forces. This asymmetric U.S. advantage is well known to even limited powers who confront U.S. interests, and they will inevitably strive to reduce that advantage if they seek to attack the United States – and today’s technology makes that possibility a serious concern. Perpetuating the well-known vulnerability of U.S. space assets is, therefore, an unacceptable security risk. The crucial importance of space was clearly highlighted in the early 1990s by the results of the first Gulf War – which the then-Air Force chief of staff, General Merrill McPeak, called the first “space war.”5 More recently, space-based assets, including communications and surveillance systems and sensors, again were essential to the rapid and decisive military victory in Iraq. Operation Iraqi Freedom would have been impossible to conduct with lightning speed and low casualties in the absence of space-based assets providing for unprecedented connectivity among internetted military systems.6 U.S. space systems are also playing a vital role in the current counter-insurgencies in Afghanistan and Iraq. The importance of space systems for the United States and its allies lies in their utter ubiquity throughout the spectrum of conflict at the tactical, operational, and strategic levels of war. The overriding importance of space to our national security was underscored in January 2001 by the “Report of the Commission to Assess United States National Security Space Management and Organization” (the Space Commission) headed by Donald Rumsfeld. How the United States develops space for civil, commercial, defense, and intelligence uses will have profound implications for national security in the next several decades. The commission emphasized that the United States has key national security interests in:

Private sector will play a larger role for government innovation. The U.S. will benefit the greatest from the private sector

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Governments in turn will rely increasingly on the private sector for a broader range of space products, services, and technologies. While government-sponsored innovation provided the initial catalyst, especially during the Cold War, the private sector will play a growing role in the development of space technologies that have potential military applications in the years ahead. Dual-use space technologies will spin off from the commercial to the military sector in unprecedented ways. This includes areas such as communications and imaging satellites and new launch vehicles as well as telecommunications, the broader availability of imagery, and GPS technologies, products, and services. The private sector will develop new products such as satellites and at the same time offer services such as we see today with telecommunications and imagery. In some cases government programs will produce infrastructure such as satellites and GPS, with the private sector then benefiting from such capabilities. Likewise, the government, including the U.S. military, will contract with the private sector to lease communications and other capabilities. For example, the U.S. military recently contracted with Paradigm Secure Communications, based in the United Kingdom, in an effort to augment the capabilities of the Defense Satellite Communications System (DSCS). The deal, worth up to $48 million over three years, will provide the military with X-band communications using Paradigm’s fleet of Skynet satellites. Currently, the U.S. military receives about 80 percent of its satellite communications capacity from commercial providers. 37 Of course, these basic trends in the growth in a commercial space sector do not guarantee that the United States will be the greatest beneficiary. This obviously depends on strategic choices taken by the United States to exploit such technologies for military purposes. Others bent on benefiting from space technologies will increasingly have access to a global commercial space sector from which they are likely to be capable of spinning off technologies for military purposes if they choose to do so. Therefore, whether or not space is “weaponized” will be increasingly beyond U.S. control as dual-use space technologies become more readily available.

Space capabilities need to achieve a wide variety of objectives to be considered vital national interest

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Making space capabilities central to either the operation of the U.S. economy or to successful prosecution of a military operation, without the assurance that those capabilities will be available when needed, is not an attractive prospect to the country’s leaders. Logically, there are two courses of action in response to this observation. One is to assure that the capabilities will be available by protecting them by either military or diplomatic means. The other is not to give them a central role, on the chance that they will be not be available in a crisis situation or will be subject to various technical or market limitations. There is even more uncertainty about the military value, even the wisdom, of developing force application capabilities that can operate in or from space. While some suggest that having the ability to project force from space can enable U.S. global hegemony,17 others judge both that such developments are not in the U.S. national interest, and at any rate may be a quarter century or more in the future.18 A full debate on this issue is just beginning in the United States, and the future contributions of space systems to U.S. power projection is a matter of substantial controversy. One respected analyst has noted that “we lack sound measures of effectiveness and analytic constructs for capturing space's military value today, much less in coming decades.”19 It is not clear, then, that space can be considered today clearly an economic or military center of gravity. Perhaps it is better to see space capabilities as strategic assets important, and in some cases essential, to achieving a wide variety of U.S. economic, political, and security objectives. Whether space by itself already constitutes a “vital national interest” may well be less important than its strategic character in relation to other important U.S. interests.

## Impact

More countries gaining WMD’s now it’s a threat to U.S. interests and allies

Aubin and Streland 2k- Dr. Stephen P. Aubin and Major Arnold Streland, phd. Director strategy execution at Raytheon and Col Arnold H. Streland, Commander, TSAT Space Group, MILSATCOM Systems Wing, Space and Missile Systems Center, October 2000 , “The Space-Based Laser Integrated Flight Experiment: Global Missile Defense in the Boost Phase”, Team SBL-IFX, http://www.wslfweb.org/docs/SBLWP.pdf

Ballistic missiles have represented one of the greatest vulnerabilities for all the nations of the world ever since the Nazis first launched the V-2 rocket near the end of World War II. One of the tragic reminders of the real and increasing threat to U.S. forces deployed abroad was the death of 28 U.S. soldiers caused by a Scud missile that struck a barracks in Dhahran during the Gulf War. More than five decades after the V-2 first appeared and nearly a decade after the Gulf War, U.S. forward-deployed troops, allies, and even the U.S. mainland remain vulnerable to missile attack and the potential delivery of weapons of mass destruction. In his February 2000 testimony on the Worldwide Threat, CIA Director George Tenet said that the proliferation of weapons of mass destruction had “become even more stark and worrisome” than just a year before. “Transfers of enabling technologies to countries of proliferation concern have not abated,” he said. “Many states in the next ten years will find it easier to obtain weapons of mass destruction and the means to deliver them.”1 Tenet added that “the missile threat to the United States from states other than Russia and China is steadily emerging. The threat to US interests and forces overseas is here and now.” Tenet pointed out that, over the next 15 years, U.S. cities will face ICBM threats from a wider variety of nations, including North Korea, Iran, and possibly Iraq. He also expressed concern about the security of nuclear weapons and materials in Russia.2 In its unclassified version of its 1999 National Intelligence Estimate, the intelligence community reiterated that “the proliferation of medium-range ballistic missiles (MRBMs) – driven primarily by North Korean No Dong sales – has created an immediate, serious, and growing threat to US forces, interests and allies, and has significantly altered the strategic balances in the Middle East and Asia.”3 In South Asia, Pakistan and India are locked in a nuclear rivalry, and the intelligence community has assessed that both countries’ short-range and medium-range ballistic missiles may have nuclear roles.4 Foreign assistance has played a key role in the increasing proliferation of missile technology, with Russia, China, and North Korea as the principal suppliers. And, Tenet warns, the recipients of missile-related technology, such as Syria and Iraq, “may emerge in the next few years as suppliers.”5

## Internal Link

Lack of U.S. interest in the full use of space now- pushing space advocates away from the military

Logston 03- John M. Logsdon is Director of the Space Policy Institute of George Washington University’s Elliott School of International Affairs in Washington, DC. “REFLECTIONS ON SPACE AS A VITAL NATIONAL INTEREST” p. 4-6 <http://www2.gwu.edu/~spi/assets/docs/space_as_a_national_interest.pdf>

If access to and full use of space is indeed a vital national interest, one would think that this situation would be very troubling to the U.S. national leadership. The reality appears rather different. The space sector has suffered from lack of high-level White House attention for most of the past three decades.9 Budgets for civilian and national security space have been relatively level for the past decade, with the NASA budget actually in decline if adjusted for inflation. Congress has dealt with space funding issues only at the margins, or to make sure the interests of particular Congressional districts are well-served. Neither the White House nor Congress has staked out a leadership position with respect addressing the current problems in the space sector. The Aerospace Commission noted the result of this neglect: “Today, however, a sense of lethargy has infected the space industry and community. Instead of the excitement and exuberance that dominated our early ventures into space, we at times seem almost apologetic about our continued investments in the space program.”10 Commissioner John Hamre, Deputy Secretary of Defense during the Clinton administration, was even more direct, suggesting that “the U.S. aerospace industry is in deep trouble. Satellite and space-launch manufacturers are in serious financial difficulty and the industry is near collapse.”11 A Leadership Failure? This essay reflects on the reasons behind the gap between current realities and rhetoric about the importance of space to U.S. interests. It asks the question: “If U.S. ability to access and use space really is a vital national interest, why is it currently in such a distressed condition?” A frequent answer to this question, offered particularly by those convinced of the vital importance of space capabilities, is that there has been a failure of vision on the part of the national leadership, who seem not to recognize the multifold contributions that space capabilities make to the country’s interests and the need for increased investments to obtain the benefits of those capabilities. Space advocates are understandably frustrated by the lack of program and funding priority given to space issues by the White House and Congressional leaders in recent years, even when policy statements which they have endorsed call for such priority. Space policy is still a “niche issue” at both ends of Pennsylvania Avenue, not high on the national agenda or on the agenda of powerful individuals. It is worth noting that this perception of failed national leadership is commonly noted by many different sectors, each contending for the attention and favor of senior government leaders. Each sector believes that its issues deserve higher policy priority and usually additional funding. The task of leaders and those who support them is to sort through competing claims and allocate limited resources according their judgment of future payoffs from current investments. Given the political character of the U.S. policymaking process, this sorting process is messy and often only approximates rational behavior. There is no objective means to evaluate the performance of national leaders in reaching policy and funding decisions; that evaluation is provided through the electoral process. So assigning a “failed” grade to leadership performance is a very subjective act.

The plan changes the perception of space to a vital national interest

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In its November 2002 report, the Commission on the Future of the United States Aerospace Industry1 concluded that “nations aspiring to global leadership in the 21st century must be space faring.” The Commission called upon the United States to create a “space imperative.”2 Leaving aside for the moment a definition of what such a “space imperative” might contain, the Commission’s conclusion about the importance of space capabilities to U.S. national interests is only the latest in a string of such declarations. A few years ago, the Long Range Plan of the U.S. Space Command suggested that “space is emerging as a military and economic center of gravity for our information-dependent forces, businesses, and society.” 3 The Commander of the U.S. Space Command at the time, General Howell Estes, went further, suggesting that space “will be considered a vital national interest – on par with how we value oil today . . .”4 The suggestion that access to space and its uses should be a high priority U.S. concern was echoed in the Clinton administration’s December 1999 A National Security Strategy for a New Century, which stated that “we are committed to maintaining U.S. leadership in space. Unimpeded access to and use of space is a vital national interest – essential for protecting U.S. national security, promoting our prosperity and ensuring our well-being.”5 This view was repeated in the Bush administration’s September 2001 Quadrennial Defense Review, which concluded that “because many activities conducted in space are critical to America’s national security and economic well-being, the ability of the United States to access and use space is a vital national interest.”6 Specific wording is important here. The phrase “vital national interest” is applied in U.S. government policy documents only to those U.S. objectives and capabilities so important that the nation would use armed force to protect and preserve them. It would be logical to conclude that if space were indeed a vital national interest, it would receive high priority in government policy and funding decisions to ensure that the country was committed to the pursuit of space power – “the pursuit of national objectives through the medium of space and the use of space capabilities.”7This is not the reality, however. There is a substantial gap between statements about the high importance of space to U.S. interests, and both the current state of U.S. space capabilities and the priority given to the space sector by the country’s leadership. The result is that a seemingly crucial national security, economic, public service, and scientific capability rests on a very fragile foundation. Aspects of that fragile foundation include the following: U.S. access to space for critical payloads is based on a space shuttle that is very expensive to operate and subject to too-frequent groundings, and on two new Evolved Expendable Launch Vehicles, the Atlas V and the Delta IV, which depend on a diminishing commercial launch market or increased government subsidies for their economic viability. Elements of an aging launch infrastructure are badly in need of revitalization. A decision on developing a fully reusable launch vehicle continues to be pushed into the indefinite future. Already approved new national security space programs such as the Space Based Infrared System and the Future Imagery Architecture are behind schedule, over budget, and facing unresolved technical problems. Meanwhile, proposed new programs such as space-based radar, a military space plane, and a new generation of GPS are delayed. A Defense Science Board task force is examining the reasons for problems with planned programs and asking whether the United States is becoming too dependent on space capabilities as an element of its national security strategy. There have been quality control problems and in-orbit failures on a number of communications satellites, and the projected growthproducing segments of the space telecommunications sector are either in bankruptcy or have been cancelled or postponed. Few orders for new commercial communication satellites are being placed. The remote sensing business has yet to establish itself as an engine of commercial space growth. The completion of a fully capable International Space Station remains uncertain as the program’s management approach is revamped, and the U.S. strategy for exploring Mars is in disarray because of changing priorities on the part of its partners. There is a systemic problem in attracting enough good young people to work in the space sector, and the overall space industrial base is in a weakened state. This is hardly the picture of a vibrant, forward-looking area of activity, fully able to be used in support of important national objectives.

\*\*\*Competitiveness\*\*\*

## Old People

Government space programs rely on a narrow technological and industrial base this is unsustainable for budgets

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Compounding the challenges from abroad is a weakening of the technological and industrial base on which American space power relies. Numerous reviews of U.S. space policy, programs, and budgets over the years have called for altering how space programs are budgeted and managed, changes in how space personnel are trained and the career paths available, and increased investment in research and technology. None of these concerns is new. Troubling signs of a weakening base for American space have been appar26ent for some time. The absence of a peer competitor and the sizeable lead in space capabilities from Cold War-era investments gave policy makers, the public, and even military leaders a false sense of security and reinforced the impression that U.S. leadership would go unchallenged with only minimal attention. Despite the national security importance of space, the United States has not put adequate resources into military space programs. Many of the approximately 100 U.S. national security satellites presently in orbit for military and surveillance operations are approaching obsolescence. Successor-generation models based on new and improved technologies frequently are delayed because they are over budget, behind schedule, and facing technical difficulties. The acquisition process for national security space programs is under severe strain, buffeted by excessive technical and schedule risk and unrealistic cost projections, leading the Defense Science Board to conclude that: “Government capabilities to lead and manage the acquisition process have seriously eroded.”27 The deleterious results of a broken acquisition system are apparent throughout the space sector. The Space-Based Infrared System (SBIRS)-High and the Space Tracking and Surveillance System (STSS) are two cases in point. While both are key parts of the missile defense system to be deployed by the United States, they have had to be restructured because of large cost overruns, schedule delays, and technical problems. For example, SBIRS-High, which is replacing the Defense Support Program (DSP) satellites and will provide rapid early warning and ballistic missile trajectory data, is now projected to cost approximately $10 billion, well over twice the amount of earlier estimates.28 Cost increases in excess of 25 percent during the last quarter of FY 2005 forced the Pentagon to recertify the program in December 2005. For FY 2009, DoD requested $2.3 billion for the program, though the Air Force is currently exploring a potential alternative or early replacement for SBIRS-High called 3GIRS.29

No talented workers in the government space programs now. Mismanagement private sector will increase the scope and intensity of programs drawing a wider research base.

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

The Rumsfeld Space Commission warned that the United States was not developing the military space cadre needed in the years ahead; a conclusion subsequently reinforced by the Walker and Allard Commissions.35 The aging aerospace workforce, bleak prospects for the growth of the space market, and uncertain career paths for military personnel have drained talented workers, scientists, engineers, and managers from the space sector. Additionally, the Allard Commission highlights the limitations of the current system of managing military space programs. In summary, the ability to threaten the United States in space will only grow in the years ahead. Small nations, as well as groups or even individuals, are increasingly able to acquire technologies and knowledge that could disrupt or destroy space systems and ground facilities. The United States could be surprised by the speed with which such capabilities are acquired by its enemies and by the rate in which its own capabilities decline. Such adversaries, especially if they are rogue states or terrorist groups, are unlikely to be bound by international agreements or global norms against the weaponization of space. Commercial Activity in Space Space has become an essential part of daily life. This includes satellites that transmit television images, provide weather forecasting data, emergency response, the infrastructure for the internet, the mapping of the Earth’s surface, and global positioning information. Space technologies are transforming the process by which we conduct business and undertake research. The net result is greater productivity with important implications for economic growth, prosperity, and innovation. Access to space-based assets is essential for a broad range of private-sector activities, which will increase both in scope and intensity as a result of the emergence of technologies including smaller satellites and cheaper boosters, miniaturization, and greater economies of scale. The space infrastructure originally established with government funding has furnished the basis for both military and commercial applications. In the years ahead, the commercial sector is likely to provide innovative impetus that spills over into the military arena. By the mid-1990s, global commercial revenues from space resulting from the rapid expansion of consumer services such as telecommunications and television were greater than the aggregate of government spending on space. In 2007 alone, spending on commercial space infrastructure, infrastructure support industries, and commercial satellite services (including direct-to-home television and GPS) totaled approximately $174 billion, accounting for nearly 70 percent of total global space spending. Alongside increased November 2002, http://www.aia-aerospace.org/pdf/commission\_report2.pdf; and Amy Butler, “Panel Wants Massive Milspace Reshuffling,” Aviation Week and Space Technology, August 14, 2008, (as of November 12, 2008).commercial spending on space, government space budgets have accounted for a steadily decreasing percentage of global space spending. In the past two years alone, the governmental share of global space spending has slipped by 8 percentage points, from 39 percent of global space spending in 2005 to 31 percent in 2007. Over the same period of time, aggregate government spending on space actually increased by $8.25 billion. The fact that government’s share of space spending decreased 8 points in spite of a 12 percent boost in spending further underscores the impressive growth of the commercial space sector.36 This means that governments will have less control over access to such services as high-resolution imagery of the Earth’s surface, which can be used for civilian or for military purposes. Growing commercialization of space will make such access more widely available as commercial investment in space technologies increases relative to that of governments.

# \*\*\*Lunar Adv\*\*\*

Government Will Buy tech from private sector

NASA looking to buy tech from private companies including a lunar vehicle

Warwick 04- Graham, Aerospace and technology journalist Graham Warwick, winner of the 2002 AJOYA Decade of Excellence Award in 2002 and most recently a director of Flight International's coverage of the Americas has 30 years of industry experience at Flight International, September 14, 2004, “Agencies seek commercial input; NASA and ESA want to obtain innovative technologies from small private-sector companies and entrepreneurs” Flight International News; Spaceflight; Pg. 27 http://www.flightglobal.com/articles/2004/09/14/187391/agencies-seek-commercial-input.html

Space organisations are moving to engage entrepreneurial and non-traditional companies in a bid to gain access to innovative commercial technologies. NASA plans to create a venture-capital fund to sponsor new technologies, while the European Space Agency has launched an initiative aimed at fostering the participation of smaller companies in space technology programmes. NASA's Mercury Fund plans to join with established private-sector venture capital firms to invest in young, privately held companies working on nanotechnology, robotics, intelligent systems and high-speed networks. The concept is similar to the US Central Intelligence Agency's government-backed venture capital fund, In-Q-Tel, which has taken strategic stakes in some 67 firms since being created in 1999. ESA, meanwhile, has issued an invitation to tender aimed specifically at small and medium-sized enterprises (SMEs), particularly those not yet involved in space programmes. The agency is looking for innovations by companies active in fields other than space that can be used in renewing its technology base. Under the Leading Edge Technology for SMEs programme, smaller firms will carry out feasibility studies or preliminary validations to demonstrate application of their technologies to space programmes. ESA has invited proposals in areas including design and engineering tools, inflatable structures, small electric thrusters and "green" rocket engines. ESA plans to award multiple 18-month, [euro]50,000--200,000 ($60,000--$240,000) contracts. Under pressure to give the private sector a role in its space exploration programme, NASA has included several smaller companies among those awarded contracts to study preliminary concepts for human lunar missions. One of these, Transformational Space (t/Space), is proposing that private industry builds and owns the lunar infrastructure and NASA buys services to support its explorers. The t/Space team includes Scaled Composites, developer of the SpaceShipOne private-venture suborbital vehicle, and AirLaunch, which is designing a low-cost, air-dropped Quickreach launch vehicle. The two companies will collaborate on designing a crew exploration vehicle that can be developed affordably by private industry. Another team member is Constellation Services International, which is developing the LEO Express concept for low-cost cargo resupply and satellite servicing.

## Political Will

Political Will to colonize the Moon/ Mars government doesn’t have the budget

Hatch 10- Emory International Law Review; J.D. Candidate, Emory University School of Law (2010); B.A., Southern Methodist University (2007). “COMMENT: DIVIDING THE PIE IN THE SKY: THE NEED FOR A NEW LUNAR RESOURCES REGIME\*”

Emory University School of Law Emory International Law Review 2010 24 Emory Int'l L. Rev. 229

Regardless of whether the Moon is able to aid humanity in solving the impending energy crisis, the satellite will have further importance as states begin evaluating the feasibility of space colonization. While space colonization may seem like the stuff of pulp science fiction, states are actually considering attempting to build Moon bases and, in turn, populating Mars. n59 The International Space Station is a preliminary venture to determine the long-term effects of living outside the confines of the Earth. n60 Additionally, the Moon may be able to furnish valuable mineral ores not commonly found on the Earth. n61 As a result, a number of states are in the initial stages of planning on [\*237] visiting the Moon to reap its potential benefits. n62 For these reasons, a new space race is about to commence, which will lead not only to competition on the Earth but to a jockeying for power in space and on the Moon itself. As a result, the law of outer space, and particularly of the Moon, is more relevant now than at any time since the end of the Cold War. B. The Coming Politics of the Moon - Dramatis Personae Probably more relevant than the substance of whether Helium-3 will be a viable solution to the world's energy problems is the fact that the most powerful nations on Earth believe that it is. Before surveying the relevant law that governs the Moon, it is instructive to know who the players in the new space race will be. In this section, I will briefly assess the current status of each spacefaring state's n63 publicly stated intentions regarding the Moon. 1. The United States of America The United States of America is a key player in the future of the Moon. Of all spacefaring nations, only the United States has actually had its citizens reach the Moon. The first Moon landing was made on July 20, 1969. n64 The United States made several return visits later in 1969, 1971, and 1972. n65 No humans have set foot on the Moon since 1972. n66 On January 14, 2004, United States President George W. Bush announced a "new vision" n67 for space exploration. This vision included a commitment to return to the Moon between 2015 and 2020. n68 During this time, astronauts would be "living and working [on the Moon] for increasingly extended [\*238] periods." n69 This increased human presence on the Moon would serve as an "important step for ... more ambitious missions," beginning with a visit to the planet Mars. n70 Towards this end, the National Aeronautics and Space Administration ("NASA") announced plans for a permanent lunar base on December 5, 2006. n71 NASA's goal was to permanently staff this base by 2024. n72 The staff would have "rotated in and out, as is done with the international space station." n73 To achieve this return to the Moon, NASA began the Constellation Program: a program that would develop both a new series of rockets as well as a new type of spacecraft that would be more conducive to travel to the Moon. n74 The Constellation Program would consequently signal the end of NASA's focus on the space shuttle program. n75 One of NASA's explicitly stated aims for this planned return to the Moon was to "establish one or more alternative energy sources for Earth based on lunar resources. Potential energy sources include Helium-3 mining for use in fusion reactors on Earth and supplying materials and components for assembly and operation of space solar power satellites ... ." n76 NASA's lunar ambitions have suffered a setback following the accession of the administration of President Barack Obama. Shortly after his inauguration, the President summoned a panel of experts unaffiliated with NASA to review the agency's lunar ambitions. n77 In September 2009, that panel argued that the Obama administration should reject plans for a return to the Moon based on high costs associated with the trip. n78 Additionally, the President's proposed [\*239] Congressional budget for 2011 includes $ 2.5 billion for the purpose of ending the Constellation Program. n79

Political Will to colonize the moon, colonization of the moon musters up the political will to colonize mars

Dinkin 04-Founder and CEO at Spaceshot, Inc.Frequent Contributer at The Space Review Chief Economist at Optimal Auctions, Inc. September 7, 2004, “Colonize the Moon before Mars” http://www.thespacereview.com/article/221/1

The Moon may become a very exciting destination with a substantial GDP. Being there first means that the high ground is already occupied for any future militarization of the Moon. It’s possible that colonizing the Moon will help muster the political will to colonize Mars. Earthers will be able to see the colony directly with their own eyes. A convincing existence proof will be there for everyone to see that colonization is feasible and profitable. A lunar colony is a politically feasible off-Earth gene bank increasing the chances that the species will be immortal. The act of leaving the cradle may be the other addition to our chances for immortality. It will be harder to monopolize communication between the Earth and Moon than Earth and Mars. This will create a free flow of ideas that will benefit both societies. There will be a greater spirit of freedom sooner with lunar colonization due to speedier development, and the faster mixing of ideas. Colonizing the Moon will also be a faster spur to legal development. The development of space law, especially property rights, mineral rights, and to a lesser extent labor law and human rights will create additional liquidity for other space colonization activities. The Moon may make a Mars colony feasible or desirable, thus enabling three branches of humanity. Having independent space nations will enrich the solar system polity and make the solar system and the species more secure from natural disaster. We can speed interstellar exploration and colonization. Ultimately we may create two new worlds that are every bit as rich, varied and interesting as our own.

Political will to colonize

Wingo no date- Dennis Wingo is a 22-year veteran of the computer, academic, and space communities. He worked for early computer pioneers in the development of local area networks which eventually led to innovations such as DSL. “Economic Development of the Solar System: The Heart of a 21st-century Spacepower Theory” NDU Press “Toward a theory of Space Power: Selected Essays” Chapter 8:

Conflict will not end with expansion into the solar system. There will always be reasons for conflicts, but one of the major ones throughout history, the acquisition of resources, will change focus. The strategic focus will change to acquiring the most easily accessible resources off planet rather than a scramble for the remaining resources here on Earth. It is speculated that a psychological shift in the populace of the world will take place that will lessen the causes for conflict here. If it is seen that there are resources beyond those of just our one planet, then much of the strategic posturing that is in active process today by China, India, countries in the Middle East, and Russia will be rendered moot, as it is based on securing a dwindling terrestrial resource base.48 The biggest problem that confronts the United States today is that many who would read this simply refuse to believe that what is laid out in this chapter is feasible. From those of us who have given our lives to the development of space, we assure you that all of this is possible and indeed necessary if we are to transcend the physical resource limitations that confront our civilization today. Problems such as climate change cannot be solved simply by conservation and alternative energy. We need to create a planetary civilization that provides opportunity for all of our world's citizens to have a better life than our ancestors and provide our children with the same beneficial society that we enjoy today. With the resources of space, this becomes possible. Without them, we are on a course toward conflict far worse than the skirmishes that have defined the last 30 years of history. We have a choice before us, and the results of the choice made by our generation will last for a very long time. Ideas are the currency of hope, and the idea of an expansive economic development of the solar system is a necessary step in educating our political leaders and our people of the hope that is out there for us to grasp.

Political Will to colonize the moon

Koelle, 97- MS Mechanical Engineering, Technical University Stuttgart, (1963) Ph.D. Berlin, (1955-65) member of the Dr. von Braun team at Huntsville Ala. (Chief, Preliminary Design, ABMA & Director, Future Projects NASA/MSFC), (1960) US Citizen, (1961) Editor-in-Chief: Handbook of Astronautical Engineering -McGraw-Hill, (1965-91) Professor of Space Technology, Technical University Berlin (TUB), (1989-91) Dean, Department of Transportation, Technical University Berlin, Member of International Academy of Astronautics, Chairman, Subcommittee on Lunar development, over 300 publications. , 1, July 1997 “ANALYSIS OF A LUNAR FACTORY BASELINE MODEL” ILR Mitt. 322 (1997)

The lunar flights of the APOLLO program led to several proposals to continue the exploration of the Moon and utilization of its resources 1-12. Regardless of how this may be done, the key to return to the Moon is the development of a new space transportation system19. None is available at the present time, after closing the production line of the SATURN 5 launch vehicle in the USA in 1969, and of the Russian ENERGIYA in 1992. Proposals to re-open these production lines have occationally been made8. However, it is unlikely that such proposals will be approved, because expendable launch vehicles are not economically attractive in a Moon-Mars program with human participation in situ. - This study has been conducted to shed some light on the economy of lunar resources eventually to be used in government sponsered projects in due course of development. It also attempts to find out, under which circumstances a commercial interest in lunar products might develop. In this connection it should be mentioned that a few years ago, a Japanese construction company has published plans on how to build a city on the Moon. Such a large program appears premature, it is unlikely to happen in the first half of the next century. But nevertheless, new computer codes are now available allowing an annual simulation of the acquisition and operation of complex lunar installations, including their logistics support by space transportation systems10,13. The next years can and must now be used to develop additional insights into this rather complex problem and prepare program proposals which might be attractive enough to lead to an other phase of lunar development. Lunar bases can be small and serve modest research needs or they may be quite sizable to provide lunar products and services in large quantities. Smaller lunar bases have been analysed elsewere20, the subject missing sofar was a lunar factory, this will be done in this report.

Will to colonize

Smiterhman 03- Member NASA Marshall Space Flight Center Advanced Concepts Office Huntsville, AL 35812 256/544-2053 [David.Smitherman@nasa.gov](mailto:David.Smitherman@nasa.gov), January 28th 2003, “"Pathways To Colonization." AIP Conference Proceedings 654, no. 1: 1243.

Key to the initiatives is not technology development or large spending bills. It It a simple matter of good policy that establishes a clear goal with incentives to move government and industry investment in a direction towards space infrastructure development. Industry and policy makers have proposed many ideas for expanding markets into space, but any initiative staled by the government must be backed up with appropriate regulations and incentives. The Public Space Travel Workshop (O'Neil. 1998). New Space Industries Workshop (Smiihcrtrian. 1998) and the National Forum on the Future Development of Space (Pooling, 2000) all identified policy issues that were critical to the successful future development of space. Key policy issues discussed repeatedly in these and other workshops and studies included the following. • Promote private investments in space development tluough govemntenl anchor tenancy, tax credits, consortiums, trade promotion, education, and endorsement. • Promote the creation of innovative financing opportunities, such as a space development bank, limited liability insurance, and government guaranteed loans to reduce risk and cost of new space investments. • Consider promoting ton policy that will leverage Uw revenues from mature ami profitable apace commerce to fund space infrastructure development initiatives. • Promote technology development and demonstration of new x-vehicles that will lower the cost of space transportation and enable public space travel. Implementation of these kinds of polices is the only way to simultaneously open new markets and spur industry to develop the required infrastructures.

## Government Wont Go to the moon

Government space programs rely on a narrow technological and industrial base this is unsustainable for budgets

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Compounding the challenges from abroad is a weakening of the technological and industrial base on which American space power relies. Numerous reviews of U.S. space policy, programs, and budgets over the years have called for altering how space programs are budgeted and managed, changes in how space personnel are trained and the career paths available, and increased investment in research and technology. None of these concerns is new. Troubling signs of a weakening base for American space have been appar26ent for some time. The absence of a peer competitor and the sizeable lead in space capabilities from Cold War-era investments gave policy makers, the public, and even military leaders a false sense of security and reinforced the impression that U.S. leadership would go unchallenged with only minimal attention. Despite the national security importance of space, the United States has not put adequate resources into military space programs. Many of the approximately 100 U.S. national security satellites presently in orbit for military and surveillance operations are approaching obsolescence. Successor-generation models based on new and improved technologies frequently are delayed because they are over budget, behind schedule, and facing technical difficulties. The acquisition process for national security space programs is under severe strain, buffeted by excessive technical and schedule risk and unrealistic cost projections, leading the Defense Science Board to conclude that: “Government capabilities to lead and manage the acquisition process have seriously eroded.”27 The deleterious results of a broken acquisition system are apparent throughout the space sector. The Space-Based Infrared System (SBIRS)-High and the Space Tracking and Surveillance System (STSS) are two cases in point. While both are key parts of the missile defense system to be deployed by the United States, they have had to be restructured because of large cost overruns, schedule delays, and technical problems. For example, SBIRS-High, which is replacing the Defense Support Program (DSP) satellites and will provide rapid early warning and ballistic missile trajectory data, is now projected to cost approximately $10 billion, well over twice the amount of earlier estimates.28 Cost increases in excess of 25 percent during the last quarter of FY 2005 forced the Pentagon to recertify the program in December 2005. For FY 2009, DoD requested $2.3 billion for the program, though the Air Force is currently exploring a potential alternative or early replacement for SBIRS-High called 3GIRS.29

No co-op now the government and the private sector have different interests and goals

Sadeh et al. 05- Eligar Sadeh, David Livingston, Thomas Matula, Haym Benaroya, a Department of Space Studies, University of North Dakota, Grand Forks, ND 58202-9008, USA b Department of Space Studies, University of North Dakota, USA c School of Business, University of Houston-Victoria, USA d Department of Mechanical and Aerospace Engineering, Rutgers University, USA, Available online 13 October 2005, “Public–private models for lunar development and commerce”, Space Policy 21 (2005) 267–275

The government, whose motivation is to act in the public interest and create public value, undertakes the risk of R&D and formulates an appropriate legal regime that facilitates PPPs for lunar development. In recent years a number of firms has proposed commercial lunar ventures. One major barrier to commercial lunar missions is the inability of firms to raise the venture capital needed for implementation of business plans. Important factors related to this barrier are the lack of credible near-term revenue markets for commercial lunar activities, and political and legal uncertainties associated withcommer cial lunar ventures [1]. The private sector cannot be confident that it will get an acceptable ROI. This sector often looks to the government to share the technological and capital risks. Fig. 1 shows how this public–private relationship is possible. An important role for the government in the PPP equation is to reduce as many of the risks as possible. This can be accomplished through policy actions that make sure that governmental actions do not adversely affect the development of the private space industry, through a role for government in capital formation for developing space technology, or by offloading governmental activities in space to the private sector. These actions can reduce risk and enhance the possibilities of ROI for private entities that can then commercialize the technologies. An acceptable region for this commercialization exists when there is a favorable benefit-to-cost ratio implying that ROI is greater than risk. PPPs of this nature characterize how space commerce has evolved in other areas, such as telecommunications, commercial launchvehicles and remote sensing. This is likely to characterize PPPs directed at lunar development. The traditional approach of government contracting of R&D deals with risks inherent in the development of new and innovative technologies. This approach has been augmented with transfers of the technology for commercial use. The PPP equation implies that the government not only contracts for R&D and facilitates the transfer of the developed technologies, but also then addresses additional political, legal and market risks. The viability of PPPs depends upon the extent to which the government reduces all these risks for the private sector. For example, the successful commercialization of telecommunication satellites, space launchveh icles and remote sensing satellites in the USA became possible because the government not only contracted for the R&D of these technologies, for its civil and military space use, but then also facilitated the transfer of these technologies to the private sector, established policies and laws that provided a licensing and regulatory regime, and promoted the development of markets that could sustain these areas of space commercialization [2]. Concomitantly, a failure to address the non-technical risks can lead to failure of PPP initiatives. This is no better illustrated in the space commercial sector then by the failure of the Earth Observation Satellite Company (EOSAT) during the 1980s. In the EOSAT case, legal, financial and market risks were not adequately considered [3]. EOSAT was established as a result of congressional legislation and was formulated as a PPP, where the federal government transferred remote sensing satellite technology (i.e., the Land Remote Sensing Satellite System or Landsat) to EOSAT. The government mandate for EOSAT was to commercialize Landsat data and to generate profits from the sale of that data. Technology transfer did not in this case foster the success of EOSAT. Even though the government provided EOSAT withope rational subsidies, these subsidies were insufficient, and there was an inadequate legal regime in place and a lack of financial mechanisms to encourage the development of a market for Landsat data. The lessons of EOSAT show that PPP viability rests on the extent to which market barriers, such as a lack of proven markets, to commercial lunar ventures can be overcome. The US Congress Commercial Space Act 1998 addresses this barrier by calling for NASA and other US federal agencies and scientific researchers to acquire space science and Earthscienc e data from commercial providers [4]. Early market products from lunar missions will probably comprise information, experimental data and samples. The logical market for these products is the scientific community. The scientific community currently has no way of purchasing these products, being dependent on NASA missions for gathering such data. A viable scientific market created through a federal grant program to fund the purchases by university and non-profit research groups of data and samples from commercial lunar ventures is one plausible option. It is important that the government foster an ‘anchor’ market for science data. A government sponsored purchase grant program provides suchan anchor tenant market for commercial lunar ventures by allowing existing lunar researchers to purchase products from the commercial sector. This allows the private sector to establisha market and achieve revenue streams necessary for implementation of business plans.

Government needs to be leaner- thin out beuracracy key to support the private industry

New York Times 04- WARREN E. LEARY and JOHN SCHWARTZ staff writers, June 14 “NASA Is Urged To Widen Role For Businesses” Section A; Column 5; National Desk; Pg. 1, http://www.nytimes.com/2004/06/15/us/nasa-is-urged-to-widen-role-for-businesses.html

NASA needs to thin out its bureaucracy and turn over many tasks to private industry if the agency is to carry out President Bush's new vision to explore the Moon and Mars, a presidential commission has concluded. The panel, the President's Commission on Moon, Mars and Beyond, which spent months considering how to reach goals outlined by Mr. Bush in a January speech, said the venture would require huge changes within NASA and steady commitment from government. ''The commission unanimously endorses this ambitious yet thoroughly achievable goal of space exploration,'' the panel said in a report to be issued Wednesday. ''Our journey will require the government to embrace fundamental changes in its management and organization.'' The panel also recommended restoring an advocate for space programs at the White House by creating a Space Exploration Steering Council. A similar council existed under the first President Bush but disbanded with his administration. Details of the report were first disclosed by Space.com, an Internet site specializing in space issues; a summary of the report was obtained by The New York Times. It said NASA should make itself a leaner organization that concentrates on research and developing space technology that is not readily available. Any technology or services useful to the space program that are available from private industry should be contracted out, it said. The agency should encourage private industry ''to assume the primary role of providing services to NASA,'' the report said -- leaving it to industry to launch most payloads into low orbit around the Earth, for instance. ''In NASA decisions, the preferred choice for operational activities must be competitively awarded contracts with private and nonprofit organizations,'' it said. ''NASA's role must be limited to only those areas where there is irrefutable demonstration that only government can perform the proposed activity.'' Increased commercialization is crucial, the panel said, ''to attainment of exploration objectives within reasonable schedules and affordable costs.''

U.S. looks for innovation from the private sector to stop bureaucracy in their government programs- They don’t want another Apollo program

New York Times 04- WARREN E. LEARY and JOHN SCHWARTZ staff writers, June 14 “NASA Is Urged To Widen Role For Businesses” Section A; Column 5; National Desk; Pg. 1, http://www.nytimes.com/2004/06/15/us/nasa-is-urged-to-widen-role-for-businesses.html

The NASA administrator, Sean O'Keefe, has repeatedly suggested that NASA should get out of the business of doing things in low Earth orbit and should be focusing its financing and goals instead on exploration beyond the home planet. Mr. O'Keefe said last week that the agency would take the commission's work seriously and expected to adopt many of its recommendations. NASA is already studying a reorganization, which according to draft documents would combine several departments within the agency and reduce the size of its bureaucracy. Howard E. McCurdy, a space expert at American University, said that at first blush, the commission might seem to be endorsing what had been happening to a great extent at NASA, with contractors already doing a good deal of the work at the agency. Within the space shuttle program, Professor McCurdy said, the main contractor, United Space Alliance, and other companies ''don't sit in the front room at mission control, but they do just about everything else.'' Still, if the space program was restructured as the commission suggests, NASA would be looking to entrepreneurs for more innovation and creativity as well, he said. And that, he said, would mean an utterly transformed space agency. ''It's not going to be some huge Project Apollo that will get us back to the Moon,'' he said. That program cost an estimated $150 billion in current dollars, he said -- a price that America is unlikely to pay.

## No Lunar Development

Sadeh et al. 05- Eligar Sadeh, David Livingston, Thomas Matula, Haym Benaroya, a Department of Space Studies, University of North Dakota, Grand Forks, ND 58202-9008, USA b Department of Space Studies, University of North Dakota, USA c School of Business, University of Houston-Victoria, USA d Department of Mechanical and Aerospace Engineering, Rutgers University, USA, Available online 13 October 2005, “Public–private models for lunar development and commerce”, Space Policy 21 (2005) 267–275

Mission concepts and plans directed at lunar base development have been proposed since the beginning of the Space Age. In January 2004, a new US civil space policy was announced based on space development to support robotic and human space exploration of the Moon, then Mars. Previous concepts and plans for lunar development, including the 2004 policy, have remained either on the political agenda or as proposed ideas for the commercial sector. Given that this has been the case, why has there not been political formulation and implementation of lunar base missions or implementation of commercial development of the Moon? This paper assesses the issues facing those in both the public and private sectors who view lunar development as a desirable goal and offers suggestions, based on partnerships between the public and private sectors in the USA, on how to make that goal a reality. Public–private partnerships (PPPs) depend on how the government reduces risks for the private sector. Identified and discussed herein are political, legal, financial, market and technical risks. There are several issues that have entrapped lunar development ideas on bothth e political and business agendas. First, an environment of uncertainty concerning political and legal regimes constrains the prospects for commercial sector interest in lunar development. Second, public policy evolves on an incremental basis. Past policies and practices change slowly and usually in response to a particular crisis or focusing event that warrants public attention. Third, lunar development advocates focus on scientific and technological benefits of lunar development, while providing weak links to economic competitiveness and national security issues that are of interest to political decision makers. Arguments for lunar development based on unspecified technological spin-offs are ineffective. Political rationales in support of lunar development are constrained because of weak public support for space in general and to reduced budgets and downsizing in government support for researchand development (R&D). Fourth, even though lunar commerce enjoys a prestige status in the private sector (numerous companies have plans to carry out commercially viable robotic ventures on the Moon), plausible business plans for lunar settlement, catering to scientific, mining and tourism projects, remain elusive and in the more distant future. The business plans that have been proposed for lunar settlement lack realistic return on investment (ROI) calculations to make the venture attractive to capital markets. These plans fail to properly identify and quantify sustainable long-term markets for the proposed ventures. Partnerships between the public and private sectors are essential to deal withth ese issues and to enable prospects for lunar development. The idea of PPPs implies the existence of political support and government funding, and aspects in the lunar development that would attract investor interest and private capital. The issue to be discussed here is how to fashion a synergistic PPP relationship. To this end, there are a number of important factors that cut across the political, legal, financial, market and technical risks inherent in the formulation and implementation of PPPs for lunar development. These factors concern the roles of governments, technology, and the private sector in the PPP equation. The roles related to each of these factors are analyzed below.

NASA not focused on colonization now

Gavert, 06- <quals>, January 20, 2006, “Lunar Colonization and NASA’s Exploration Changes”, AIP Conference Proceedings [serial online].;813(1):1033-1040.

Space colonization is not part of NASA’s mission planning. NASA’s exploration vision, mission goals and program implementations, however, can have an important affect on private lunar programs leading towards colonization. NASA’s exploration program has been described as a journey not a race. It is not like the Apollo mission having tight schedules and relatively unchanging direction. NASA of this era has competing demands from the areas of aeronautics, space science, earth science, space operations and, there are competing demands within the exploration program itself. Under the journey not a race conditions, an entrepreneur thinking about building a hotel on the Moon, with a road to an exploration site, might have difficulty determining where and when NASA might be at a particular place on the Moon. Lunar colonization advocates cannot depend on NASA or other nations with space programs to lead the way to colonization. They must set their own visions, mission goals and schedules. In implementing their colonization programs they will be resource limited. They would be like “hitchhikers” following the programs of spacefaring nations identifying programs that might have a fit with their vision and be ready to switch to other programs that may take them in the colonization direction. At times they will have to muster their own limited resources and do things themselves where necessary. The purpose of this paper is to examine current changes within NASA, as a lunar colonization advocate might do, in order to see where there might be areas for fitting into a lunar colonization strategy. The approach will help understand how the “hitchhiking” technique might be better utilized.

## Colonization Impacts

Space colonization solves the economy- employment and space tourism

Siegfried 2003 W. H. The Boeing Company, Integrated Defense Systems “Space Colonization—Benefits for the World” http://www.aiaa.org/participate/uploads/acf628b.pdf

There are also many sociological benefits of Space Colonization. We must remember that such an endeavor cannot be implemented by one any agency or single government. A world policy would be needed. In the United States, the combined efforts of NASA, DOE, DOI, DOT, DOC, and others would be focused in addition to our broad industrial base and the commercial world. It should be noted that the eventual space tourism market (tapping in to the world annual $3,400 billion market or the United States $120 billion per year “adventure travel” market) (Reichert, 1999) will not be based on the work of isolated government agencies but, rather, evolve from a synergistic combination of government, travel industry, hotel chains, civil engineering, and, yes, a modified version of industry as we know it today. The change in emphasis from our present single-objective missions to a broadband Space Colonization infrastructure will create employment here on Earth and in space for millions of people and will profoundly change our daily life on Earth. This venue, initiated by short suborbital followed by short orbital and then orbital hotel stays (Collins, 2000) has already begun with brief visits to the ISS. Once systems evolve that can reduce the cost of a “space ticket” to some $10,000 to $50,000 US, the market will grow. Fig 2 is typical of studies on space tourism passengers that could be expected vs. costs of the trip.

Global war

So far, such half-hearted experiments not only have failed to work; they have left the societies that have tried them in a progressively worse position, farther behind the front-runners as time goes by. Argentina has lost ground to Chile; Russian development has fallen farther behind that of the Baltic states and Central Europe. Frequently, the crisis has weakened the power of the merchants, industrialists, financiers, and professionals who want to develop a liberal capitalist society integrated into the world. Crisis can also strengthen the hand of religious extremists, populist radicals, or authoritarian traditionalists who are determined to resist liberal capitalist society for a variety of reasons. Meanwhile, the companies and banks based in these societies are often less established and more vulnerable to the consequences of a financial crisis than more established firms in wealthier societies. As a result, developing countries and countries where capitalism has relatively recent and shallow roots tend to suffer greater economic and political damage when crisis strikes--as, inevitably, it does. And, consequently, financial crises often reinforce rather than challenge the global distribution of power and wealth. This may be happening yet again. None of which means that we can just sit back and enjoy the recession. History may suggest that financial crises actually help capitalist great powers maintain their leads--but it has other, less reassuring messages as well. If financial crises have been a normal part of life during the 300-year rise of the liberal capitalist system under the Anglophone powers, so has war. The wars of the League of Augsburg and the Spanish Succession; the Seven Years War; the American Revolution; the Napoleonic Wars; the two World Wars; the cold war: The list of wars is almost as long as the list of financial crises. Bad economic times can breed wars. Europe was a pretty peaceful place in 1928, but the Depression poisoned German public opinion and helped bring Adolf Hitler to power. If the current crisis turns into a depression, what rough beasts might start slouching toward Moscow, Karachi, Beijing, or New Delhi to be born? The United States may not, yet, decline, but, if we can't get the world economy back on track, we may still have to fight.

# \*\*\*Private Sector\*\*\*

## Private Sector Internal Link

Government space programs rely on a narrow technological and industrial base this is unsustainable for budgets

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

Compounding the challenges from abroad is a weakening of the technological and industrial base on which American space power relies. Numerous reviews of U.S. space policy, programs, and budgets over the years have called for altering how space programs are budgeted and managed, changes in how space personnel are trained and the career paths available, and increased investment in research and technology. None of these concerns is new. Troubling signs of a weakening base for American space have been appar26ent for some time. The absence of a peer competitor and the sizeable lead in space capabilities from Cold War-era investments gave policy makers, the public, and even military leaders a false sense of security and reinforced the impression that U.S. leadership would go unchallenged with only minimal attention. Despite the national security importance of space, the United States has not put adequate resources into military space programs. Many of the approximately 100 U.S. national security satellites presently in orbit for military and surveillance operations are approaching obsolescence. Successor-generation models based on new and improved technologies frequently are delayed because they are over budget, behind schedule, and facing technical difficulties. The acquisition process for national security space programs is under severe strain, buffeted by excessive technical and schedule risk and unrealistic cost projections, leading the Defense Science Board to conclude that: “Government capabilities to lead and manage the acquisition process have seriously eroded.”27 The deleterious results of a broken acquisition system are apparent throughout the space sector. The Space-Based Infrared System (SBIRS)-High and the Space Tracking and Surveillance System (STSS) are two cases in point. While both are key parts of the missile defense system to be deployed by the United States, they have had to be restructured because of large cost overruns, schedule delays, and technical problems. For example, SBIRS-High, which is replacing the Defense Support Program (DSP) satellites and will provide rapid early warning and ballistic missile trajectory data, is now projected to cost approximately $10 billion, well over twice the amount of earlier estimates.28 Cost increases in excess of 25 percent during the last quarter of FY 2005 forced the Pentagon to recertify the program in December 2005. For FY 2009, DoD requested $2.3 billion for the program, though the Air Force is currently exploring a potential alternative or early replacement for SBIRS-High called 3GIRS.29

No talented workers in the government space programs now. Mismanagement private sector will increase the scope and intensity of programs drawing a wider research base.

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

The Rumsfeld Space Commission warned that the United States was not developing the military space cadre needed in the years ahead; a conclusion subsequently reinforced by the Walker and Allard Commissions.35 The aging aerospace workforce, bleak prospects for the growth of the space market, and uncertain career paths for military personnel have drained talented workers, scientists, engineers, and managers from the space sector. Additionally, the Allard Commission highlights the limitations of the current system of managing military space programs. In summary, the ability to threaten the United States in space will only grow in the years ahead. Small nations, as well as groups or even individuals, are increasingly able to acquire technologies and knowledge that could disrupt or destroy space systems and ground facilities. The United States could be surprised by the speed with which such capabilities are acquired by its enemies and by the rate in which its own capabilities decline. Such adversaries, especially if they are rogue states or terrorist groups, are unlikely to be bound by international agreements or global norms against the weaponization of space. Commercial Activity in Space Space has become an essential part of daily life. This includes satellites that transmit television images, provide weather forecasting data, emergency response, the infrastructure for the internet, the mapping of the Earth’s surface, and global positioning information. Space technologies are transforming the process by which we conduct business and undertake research. The net result is greater productivity with important implications for economic growth, prosperity, and innovation. Access to space-based assets is essential for a broad range of private-sector activities, which will increase both in scope and intensity as a result of the emergence of technologies including smaller satellites and cheaper boosters, miniaturization, and greater economies of scale. The space infrastructure originally established with government funding has furnished the basis for both military and commercial applications. In the years ahead, the commercial sector is likely to provide innovative impetus that spills over into the military arena. By the mid-1990s, global commercial revenues from space resulting from the rapid expansion of consumer services such as telecommunications and television were greater than the aggregate of government spending on space. In 2007 alone, spending on commercial space infrastructure, infrastructure support industries, and commercial satellite services (including direct-to-home television and GPS) totaled approximately $174 billion, accounting for nearly 70 percent of total global space spending. Alongside increased November 2002, http://www.aia-aerospace.org/pdf/commission\_report2.pdf; and Amy Butler, “Panel Wants Massive Milspace Reshuffling,” Aviation Week and Space Technology, August 14, 2008, (as of November 12, 2008).commercial spending on space, government space budgets have accounted for a steadily decreasing percentage of global space spending. In the past two years alone, the governmental share of global space spending has slipped by 8 percentage points, from 39 percent of global space spending in 2005 to 31 percent in 2007. Over the same period of time, aggregate government spending on space actually increased by $8.25 billion. The fact that government’s share of space spending decreased 8 points in spite of a 12 percent boost in spending further underscores the impressive growth of the commercial space sector.36 This means that governments will have less control over access to such services as high-resolution imagery of the Earth’s surface, which can be used for civilian or for military purposes. Growing commercialization of space will make such access more widely available as commercial investment in space technologies increases relative to that of governments.

The plan breaks down the wisdom that missile defense tech is doomed

Pinkerton 01- James K., frequent columnist for fox news fellow at the New America foundation in Washington D.C. Former Columnist for Newsday He worked in the White House domestic policy offices of Presidents Ronald Reagan and George H.W. Bush and in the 1980, 1984, 1988 and 1992 presidential campaigns. In 2008 he served as a senior adviser to the Mike Huckabee for President Campaign, July 16, 2001, “Missile Defense Spinoffs from Outer Space”, http://www.newamerica.net/node/6152

Which is unfortunate, because the unfashionable science they champion has a way of proving itself. In the last few years it's become the conventional wisdom in Washington that missile defense technology is doomed, because, in the popular cliche, "You can't hit a bullet with a bullet." Well, the Pentagon did just that on Saturday night. A projectile, the so-called "kill vehicle," hit a dummy warhead when both were traveling at 4.5 miles per second. Not bad. And while missile defense has a long way to go, the test is a distant early warning to the establishment that the idea might work. As for the astronomers who have been reaping the huge benefits of SDI/NMD, they are not obligated to support missile defense as a form of gratitude for the technogoodies they have received. But as a group, speaking louder than the articulate but lonely voice of Jastrow, astronomers might speak up just a bit. After all, if missile defense technology is good enough for them to use in their stargazing, it might just be good enough to use in defending America.

Specifically redoing brilliant pebbles incentivizes the development of new technologies

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

The Lunar Landing Program began in May 1961 with Kennedy’s daring declaration before a joint session of Congress to land a man on the moon before the end of the decade. With the possible exception of the Manhattan Project, technology had never been so brutally challenged. The world’s first satellite, Sputnik, launched in 1957 and visible to nearly every backyard in America, had flashed a warning that awakened the nation to its vulnerabilities to the Soviet race into space and its nuclear ICBM development efforts. By 1961 competition with the Union of Soviet Socialist Republics (USSR) had become vital to U.S. geopolitical interests.In April, Soviet cosmonaut Yuri Gagarin pulled ahead as the first to orbit the Earth. In May, astronaut Alan Shepard followed with the first U.S. suborbital flight, which was wildly celebrated by the American public. Kennedy took heed and responded three weeks later with his challenge, a stunningly bold move to put the nation ahead in space via the moon. Thus, the political dynamics were in place to drive technology toward a maximum outcome, i.e., taking a supportive role by letting technology determine the outcome. The now two-year-old National Aeronautics and Space Administration (NASA) took the charge with straight-line logic: how to get from here to there and back as efficiently and safely as possible. To achieve this, the Mercury missions were given new challenges, with Gemini following to pioneer new achievements as the bridge to the Apollo moon program. Each phase contributed synergistically to the other components also being worked on, so that the sum of the whole (the lunar landing mission) at any given time was greater than its parts. Spacecraft designs begat new spacecraft designs; guidance systems begat new guidance systems; living one day in space begat 14 days; and on and on into a myriad of thousands of components of human intellect and endeavor, and materiel designs and functions that were all pointed to one declared mission. There were tragic deaths, other dangerous moments, and discouraging failures along the way. There were also hundreds of useful spin-offs that helped to give the United States its commanding lead in technology. But the mission point was never lost and scores of heroes abounded, as on July 20, 1969 – eight years after Kennedy’s challenge – the Eagle landed at Tranquility Base. Of singular significance to this discussion is that throughout the Lunar Landing Program, each component and phase had its own place in the continuity and integrity of the overall mission. Remove one component and the entire mission would fail. Therefore, the program could not be arbitrarily cut in half or more in a Solomon-like gesture and still be expected to succeed. The significance is that the same applied to Brilliant Pebbles; it was cut and it died.2

## Colonization Module

NASA looking to buy tech from private companies including a lunar vehicle

Warwick 04- Graham, Aerospace and technology journalist Graham Warwick, winner of the 2002 AJOYA Decade of Excellence Award in 2002 and most recently a director of Flight International's coverage of the Americas has 30 years of industry experience at Flight International, September 14, 2004, “Agencies seek commercial input; NASA and ESA want to obtain innovative technologies from small private-sector companies and entrepreneurs” Flight International News; Spaceflight; Pg. 27 http://www.flightglobal.com/articles/2004/09/14/187391/agencies-seek-commercial-input.html

Space organisations are moving to engage entrepreneurial and non-traditional companies in a bid to gain access to innovative commercial technologies. NASA plans to create a venture-capital fund to sponsor new technologies, while the European Space Agency has launched an initiative aimed at fostering the participation of smaller companies in space technology programmes. NASA's Mercury Fund plans to join with established private-sector venture capital firms to invest in young, privately held companies working on nanotechnology, robotics, intelligent systems and high-speed networks. The concept is similar to the US Central Intelligence Agency's government-backed venture capital fund, In-Q-Tel, which has taken strategic stakes in some 67 firms since being created in 1999. ESA, meanwhile, has issued an invitation to tender aimed specifically at small and medium-sized enterprises (SMEs), particularly those not yet involved in space programmes. The agency is looking for innovations by companies active in fields other than space that can be used in renewing its technology base. Under the Leading Edge Technology for SMEs programme, smaller firms will carry out feasibility studies or preliminary validations to demonstrate application of their technologies to space programmes. ESA has invited proposals in areas including design and engineering tools, inflatable structures, small electric thrusters and "green" rocket engines. ESA plans to award multiple 18-month, [euro]50,000--200,000 ($60,000--$240,000) contracts. Under pressure to give the private sector a role in its space exploration programme, NASA has included several smaller companies among those awarded contracts to study preliminary concepts for human lunar missions. One of these, Transformational Space (t/Space), is proposing that private industry builds and owns the lunar infrastructure and NASA buys services to support its explorers. The t/Space team includes Scaled Composites, developer of the SpaceShipOne private-venture suborbital vehicle, and AirLaunch, which is designing a low-cost, air-dropped Quickreach launch vehicle. The two companies will collaborate on designing a crew exploration vehicle that can be developed affordably by private industry. Another team member is Constellation Services International, which is developing the LEO Express concept for low-cost cargo resupply and satellite servicing.

(terminal impact)

## Uniqueness

Private sector is necessary- NASA funding chopped

Amos 3-8-11 – Jonathan Amos, Science correspondent, BBC News, “Difficult decisions ahead on Mars,” http://www.bbc.co.uk/news/science-environment-12676289

The joint Mars exploration envisioned by the US and Europe is set for an overhaul, following an announcement by the Americans that their part of the budget is critically short of funds.

Nasa and Esa had agreed to send two rovers to the Red Planet in 2018.

In Europe's case, this vehicle is already designed and about to be built.

But a new report from the US National Research Council says the probable $3.5bn (£2.2bn) cost of the American side of the mission is $1bn too high.

The "planetary decadal survey" - which is only an advisory document at this stage - recommends the effort be scaled back or postponed indefinitely.

Money is critical- need to make tech cheaper

**Sauser 6-29-11 –** Brittany Sauser, Technology Review published by MIT, “Private Space Industry Works to Replace the Shuttle,” http://www.technologyreview.com/blog/deltav/tags/commercial+space/

NASA has released the first edition of its new bi-monthy newsletter that focuses on "happenings" in the agency's commercial spaceflight development program. The first newsletter is devoted to the progress made in the commercial crew development program, which recently awarded four companies money to develop spacecraft that can carry astronauts to space. The progress made by these companies--SpaceX, Boeing, Blue Origin, and Sierra Nevada Corporation--is small. But with the space shuttle's final mission scheduled for July 8, the pressure is on for these companies to work quickly and efficiently to meet their goals.

"The space shuttle's retirement gives commercial companies more incentive to push the development of their systems," says Craig Steidle, the president of the Commercial Spaceflight Federation. "They are excited about what's coming up, but the pressure is getting financial support, to make sure we have the money to allow them to do spaceflight demonstrations."

Space solves economy- innovation

**Wu 7-8-11 –** David Wu, Representative Democrat- Oregon, “Pursuing the next giant leap in space exploration,” http://thehill.com/blogs/congress-blog/technology/170401-pursuing-the-next-giant-leap-in-space-exploration-

In a time of growing debt, people question the value of taxpayer funded federal research. I passionately believe that federal investment in research and development grows our economy, creates jobs and shrinks the federal deficit. Economists say that between 65 and 90 percent of growth in U.S. per-capita income stems from innovation, defined broadly as new products, processes and business models. But we face increased international competition from countries that are investing more in science, technology and education than we are. If we are to once again have a stable economy, we must rededicate ourselves to the investments that make us strong: small business, education, and research and development. Research and development at NASA have resulted in an array of successful products and technologies that touch our daily lives, including heart rate monitors, wireless headsets, and water purification systems. In short, NASA's space program has helped our country become an economic powerhouse.

NASA can’t get to Mars- programs failing

Zimmerman 11 – Robert Zimmerman, http://behindtheblack.com/behind-the-black/essays-and-commentaries/bad-news-for-nasa-good-news-for-private-space

Earlier this week NASA submitted a report to Congress reviewing the design and construction status of the heavy-lift rocket and manned capsule that Congress has required them to build and launch by 2016. NASA’s conclusion: the space agency doesn’t think it can do the job in the schedule or budget that Congress has provided.

NASA does not believe this goal is achievable based on a combination of the current funding profile estimate, traditional approaches to acquisitions and currently considered vehicle architectures. . . . We will not commit to a date that has a low probability of being achieved.

NASA’s conclusions here are not surprising. The agency had been having trouble building Constellation on the much bigger budget and longer schedule given to them by past Congresses. For them to build the-program-formerly-called-Constellation for less money and in less time is probably impossible.

**Need new technology development to go to mars**

**http://www.dailygalaxy.com/my\_weblog/2010/02/s-colonizing-space-an-imperative-obamas-new-space-strategy-says-yes-lays-groundwork-for-human-space-.html**

Obama is sensibly ceding space flight development to the private sector, with new ventures such as SpaceX who will be will be ferrying astronauts to the ISS, and other aerospace companies who are very close to launching humans into orbit. So the government would be partnering with private industry to send astronauts to space.

Buzz Aldrin, often an outspoken critic of the space program, said: "I also believe the steps we will be taking following the President's direction will best position NASA and other space agencies to send humans to Mars and other exciting destinations as quickly as possible. To do that, we will need to support many types of game-changing technologies NASA and its partners will be developing."

**Private sector would cost much less- AT Spending**

**Rees 09**

[Martin Rees, astrophysicist and cosmologist at Cambridge University, Astronomer Royal, former President of the Royal Society, Master of Trinity College, 22 July 2009, “Our next giant leap will need private backing,” The Times, http://www.timesonline.co.uk/tol/comment/columnists/guest\_contributors/article6722405.ece]

Any of these motives could drive the first travellers to Mars, or the first long-term denizens of a lunar base. Manned spaceflight could be a lot cheaper if it were not state-funded or a multinational programme, but bankrolled privately. There have long been maverick dreamers with schemes for space exploits. Such enthusiasts now include wealthy people with genuine commercial and technical savvy. Companies funded by Jeff Bezos, of Amazon, and Elon Musk, the founder of PayPal, are developing new rockets. The recent “Google prize” to launch a robotic lunar lander is engaging many ingenious inventors, and leveraging far more money than the prize itself. Potential sponsors with an eye on posterity might note that Queen Isabella is now remembered primarily for her support of Columbus. If humans venture back to the Moon and beyond, they may carry commercial insignia rather than national flags. Perhaps future space probes will be plastered in logos, as Formula One racers are now. Perhaps “robo-wars” in space will be a lucrative spectator sport. Perhaps pioneer settlers in space communities will live (and even die) in front of a worldwide audience — the ultimate in “reality TV”. One plausible scenario would involve a permanently manned lunar base, pioneers on Mars, and perhaps small artificial habitats cruising the solar system, attaching themselves to asteroids or comets.

First exploration mission leads to more

http://www.permanent.com/ep-a-v-l.htm

A first mission, with the proper public relations effort, would surely mobilize public attention, including capital from the world's biggest movers and shapers. The current barriers are publicity of the concepts (which this book deals with) and the psychological barrier ("Is this for real?" -- but forget the die-hard skeptics -- cynics never have found a way to make a difference in *making* history).

A first mission, however modest, would open the floodgates to investment and competition - a "space race" between private companies, and the owner of the first mission would have a huge lead on the competition as well as be in a strong position to sell to the competition. What better game plan is there?

US must remain at the leader in space exploration

http://thehill.com/blogs/congress-blog/technology/170465-new-launch-systems-hold-potential-for-space-exploration

NASA has been enormously successful in pursuing human space exploration. NASA technology and spin-offs have made America and the world a better place to live. Artificial hearts, life-saving defibrillators, cell phones, lasers, GPS systems, air purifiers and countless other NASA technologies shape our daily lives. NASA has not only led America to explore the depths of outer space, it has altered our individual space and brought us to a greater understanding of our world, our communities and ourselves.

On Friday, the last of the shuttles, Atlantis, made its final voyage into space. The end of the space shuttle era is a bittersweet moment. It has been the star in America’s space program for three decades, giving us the Hubble telescope and the International Space Station. It has established American preeminence and enabled us to do what no other nation could.

We are now at a crossroads. Long pioneers in spaceflight, the United States faces the possibility of depending on foreign nations for the superior technologies that space access provides. Yet, the United States can and must remain the international leader in space exploration, particularly in the area of human spaceflight. NASA is a reflection of American exceptionalism, setting America apart technologically, scientifically and economically.

## Solvency

Plan allows for commercial development of space

Dolman 10- Everett Dolman, PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies, September 2010, “The Case for Weapons in Space: A Geopolitical Assessment” APSA Annual Meeting, pg 30

Moreover, if the United States were willing to deploy and use a military space force that maintained effective control of space, and did so in a way that was perceived as tough, non-arbitrary, and efficient, such an action would serve to discourage competing states from fielding opposing systems. **It could also set the stage for a new space regime, one that encourages space commerce and development.** Should the United States use its advantage to police the heavens and allow unhindered peaceful use of space by any and all nations for economic and scientific development, over time its control of LEO could be viewed as a global public good. In much the same way the British maintained control of the high seas in the nineteenth century, enforcing international norms of innocent passage and property rights, and against slavery, **the US could prepare outer space for a long-overdue burst of economic expansion.**

Space Missile Defense key to colonization- space missile defense satellites can be used to research celestial bodies

German Press Agency 96- German newspaper, December 3, 1996, “Ice on moon increases chance of colonization”, pg. Lexis

The apparent discovery of ice on the lunar south pole increases the chance that man might one day colonize Earth's moon and use it as a refuelling base for space flights, U.S. scientists said Tuesday. That startling prospect comes with news that the moon, once thought to be completely without water, has at least one small frozen lake hidden deep inside a crater, according to data recorded by a U.S. spacecraft. The discovery was made by Clementine, a 226-kilogram craft with sophisticated radar equipment developed during the now abandoned space-based "Star Wars" anti-ballistic missile defence system championed in the 1980s by President Ronald Reagan, Air Force Colonel Pedro Ruston said at the Pentagon. The spacecraft was launched in January 1994 in a joint endeavour by the Defense Department, the U.S. Ballistic Missile Defense Organization and NASA, the U.S. space agency, to test the equipment, but scientists quickly decided in-mission to turn its multi-spectrum radar antenna on lunar craters at both ends of the orb. Ruston, head of the Ballistic Missile Defense Organization, told reporters the "experiment of opportunity" hit pay dirt when it found ice in the moon's South Pole-Aitken basin.

Boost phase is better laundry list

Aubin and Streland 2k- Dr. Stephen P. Aubin and Major Arnold Streland, phd. Director strategy execution at Raytheon and Col Arnold H. Streland, Commander, TSAT Space Group, MILSATCOM Systems Wing, Space and Missile Systems Center, October 2000 , “The Space-Based Laser Integrated Flight Experiment: Global Missile Defense in the Boost Phase”, Team SBL-IFX, http://www.wslfweb.org/docs/SBLWP.pdf

There are a number of advantages to intercepting an aggressor’s missile in the boost phase. The first is that the missile is most vulnerable during its launch. There is a large infrared signature, thanks to the burning fuel; the missile maintains a slowly changing attitude, making it easier to track; and the rocket body is relatively fragile and under great aerodynamic stress. Additionally, because the warhead has not separated from the launcher, there is a relatively large lethal-hit area when attempting to destroy the missile. The boost phase also occurs before any decoys or countermeasures can be initiated by an aggressor. One of the greatest challenges for hit-to-kill kinetic interceptors attempting to destroy warheads in the midcourse or descent phases is the ability to distinguish between the warheads and the decoys. In the descent phase, advanced warheads may also maneuver and be less predictable in terms of their flight paths. The combination of using directed energy intercept in the boost phase and kinetic intercept in the midcourse and terminal phases would increase the likelihood of successfully defeating countermeasures aimed at thwarting missile defense systems. In fact, countermeasures, like deploying decoys and maneuvering outside of the projected target track, which may be effective against kinetic interceptors, are ineffective against directed energy attack during boost phase. Likewise, countermeasures that are aimed at reducing the effectiveness of directed energy systems, like hardening of missiles to prevent laser penetration and fast burn to shorten the boost phase, are ineffective against mid-course and terminal phase kinetic interceptors. Another key advantage and potential deterrent to a would-be aggressor is the fact that ballistic missiles destroyed early in the boost phase usually explode and fall over the aggressor’s own territory, forcing the aggressor to confront the risk of nuclear, chemical or biological debris. The greatest challenge of boost phase intercept is the speed required to catch an aggressor’s missile in the first few minutes of flight. Although the United States has the capability to detect missile launches very early in flight, the speed limitations of interceptor missiles being developed make it unlikely that they could destroy the aggressor missile before its launcher burns out. This challenge, however, can be overcome by using directed energy, which moves at the speed of light ­ 186,000 miles per second (or 300,000 kilometers per second). To illustrate this advantage, consider the speed of the ground-based interceptor being developed for National Missile Defense, which is in the vicinity of 7 kilometers per second. (This is faster than today’s theater interceptors under development, which were capped at 5.5 kilometers per second in the September 1997 Agreed Statement to the ABM Treaty of 1972.) Even if the interceptor were positioned close enough to achieve intercept, it is a very challenging task and not nearly as efficient as directed energy, which travels about 43,000 times faster than the most capable groundbased interceptors. Given its speed, directed energy should be seen as complementing the critical role kinetic interceptors play in the mid-course and terminal phases of a missile attack. Both the Airborne Laser, which is being developed to address short- and medium-range theater ballistic missiles, and the Space-Based Laser, which is being designed to counter ICBMs deep in the aggressor’s 4 territory, can detect and intercept missiles almost instantaneously. Each works by acquiring the infrared signature of the boosting missile, tracking its course with a low-power laser, and then focusing a high-power laser on the body of the boosting missile. The heat of the laser weakens the missile’s skin, and the internal pressures and supersonic aerodynamic flight stresses cause it to explode.

Feasibility card+ missile defense causes development of other lasers

Aubin and Streland 2k- Dr. Stephen P. Aubin and Major Arnold Streland, phd. Director strategy execution at Raytheon and Col Arnold H. Streland, Commander, TSAT Space Group, MILSATCOM Systems Wing, Space and Missile Systems Center, October 2000 , “The Space-Based Laser Integrated Flight Experiment: Global Missile Defense in the Boost Phase”, Team SBL-IFX, http://www.wslfweb.org/docs/SBLWP.pdf

In June 2000, the Tactical High Energy Laser, or THEL, successfully shot down a Katyusha rocket at the White Sands Missile Range in New Mexico. On several occasions in August and September, THEL managed another feat by engaging and destroying two-missile salvos of Katyusha rockets. To date, THEL has negated a total of 13 Katyusha rockets. Although THEL is being designed for tactical use by the U.S. Army and the Israeli Army, its success demonstrates how far directed energy research and development have progressed in recent years. The SBL-IFX program builds on more than twenty years of research and investment by the nation in the development of directed energy weapon systems, technologies and related facilities. The Defense Advanced Research Projects Agency initiated the SBL program in 1977. It was later transferred to the Strategic Defense Initiative Organization (SDIO) in 1984. In May 1997, a Memorandum of Agreement was signed transferring execution of the SBL-IFX from the Ballistic Missile Defense Organization, SDIO’s successor, to the Air Force. Over the years, the members of Team SBL-IFX have played central roles in several directed energy programs that have advanced the nation’s understanding of a space-based laser missile defense option, including Zenith Star, Mid-InfraRed Advanced Chemical Laser (MIRACL), Alpha, the Airborne Laser (ABL), the Tactical High Energy Laser (THEL), the High Energy Laser Systems Test Facility (HELSTF), and the Alpha-LAMP Integration (ALI) program. This heritage of success provides the foundation for a successful Space-Based Laser Integrated Flight Experiment ­ a critical step toward providing the nation and its allies with a global, boost-phase defense against the evolving threat of ballistic missiles.

Space assets need to be used for high priority objectives- Bin Laden

Logston 03- John M. Logsdon is Director of the Space Policy Institute of George Washington University’s Elliott School of International Affairs in Washington, DC. “REFLECTIONS ON SPACE AS A VITAL NATIONAL INTEREST” p. 18 http://www2.gwu.edu/~spi/assets/docs/space\_as\_a\_national\_interest.pdf

What then can substitute for an international challenge to create the U.S. “space imperative” that seems needed to shake the sector out of its current lethargy? The best candidate is a clear demonstration, most likely in the national security sector, of the contribution of space assets to a high priority U.S. interest or objective. What if, for example, the use of space capabilities led to the capture of Osama bin Laden, the location of weapons of mass destruction in Iraq, or the interdiction of a terrorist action against U.S. interests? Such a success could add credibility to the argument that increased priority for space would have great benefits to the nation, and could catalyze the kind of changes suggested above. If this were to happen, the United States could indeed make space capabilities a corner of its national power.

new scientific R&D, technology needs to be better rather than broader

Paarlbarg, 04- Robert L. Professor of Political Science at Wellesley College and Associate at the Weatherhead Center for International Affairs at Harvard University. He received his B.A. in government from Carleton College in Minnesota and his Ph.D. in government from Harvard. He has served as visiting professor of government at Harvard, as a legislative aide in the U.S. Senate, and as an officer in the U.S. Naval Intelligence Command., Summer 2004, “Knowledge as Power Science, Military Dominance, and U.S. Security”, International Security, Volume 29, Number 1, Summer 2004, pp. 122-151 (Article), pg. 122-123

Can the United States maintain its global lead in science, the new key to its recently unparalleled military dominance? U.S. scientific prowess has become the deep foundation of U.S. military hegemony. U.S. weapons systems currently dominate the conventional battlefield because they incorporate powerful technologies available only from scientiªcally dominant U.S. weapons laboratories. Yet under conditions of globalization, scientiªc and technical (S&T) knowledge is now spreading more quickly and more widely, suggesting that hegemony in this area might be difªcult for any one country to maintain. Is the scientiªc hegemony that lies beneath U.S. weapons dominance strong and durable, or only weak and temporary? Military primacy today comes from weapons quality, not quantity. Each U.S. military service has dominating weapons not found in the arsenals of other states. The U.S. Air Force will soon have ªve different kinds of stealth aircraft in its arsenal, while no other state has even one. U.S. airborne targeting capabilities, built around global positioning system (GPS) satellites, joint surveillance and target radars, and unmanned aerial vehicles are dominating and unique.1 On land, the U.S. Army has 9,000 M1 Abrams tanks, each with a ªre-control system so accurate it can ªnd and destroy a distant enemy tank usually with a single shot. At sea, the U.S. Navy now deploys Seawolf nuclear submarines, the fastest, quietest, and most heavily armed undersea vessels ever built, plus nine supercarrier battle groups, each carrying scores of aircraft capable of delivering repeated precision strikes hundreds of miles inland. No other navy has even one supercarrier group Such weapons are costly to build, and the large relative size of the U.S. economy (22 percent of world gross domestic product [GDP]) plus the even larger U.S. share of global military spending (43 percent of the world total in 2002, at market exchange rates) have been key to the development and deployment of these forces. Yet economic dominance and spending dominance would not sufªce without knowledge dominance. It is a strong and rapidly growing S&T capacity that has allowed the United States to move far ahead of would-be competitors by deploying new weapons systems with unmatched scienceintensive capabilities. It was in the middle of the twentieth century that the global arms race more fundamentally became a science race. Prior to World War II, military research and development (R&D) spending absorbed on average less than 1 percent of total major power military expenditures. By the 1980s, the R&D share of major power military spending had increased to 11–13 percent.3 It was precisely during this period, as science became a more important part of military might, that the United States emerged as the clear global leader in science. During World War II, the military might of the United States had come more from its industrial capacity (America could build more) than from its scientiªc capacity (Europe, especially Germany and the United Kingdom, could still invent more). As that war came to an end, however, a fortuitous migration of European scientists to the United States plus wartime research investments such as the Manhattan Project gave the United States the scientiªc as well as the industrial lead.

co-op now on corporate satellites with the government the private sector will need to play a larger role in the future

Defense Daily 3-31- “Satellite Industry Companies Create Alliance Favoring Hosted Payloads” Vol. 249 No. 61 http://www.defensedaily.com/publications/dd/Satellite-Industry-Companies-Create-Alliance-Favoring-Hosted-Payloads\_13099.html

Seven satellite industry companies yesterday said they have agreed to form an industry alliance to increase awareness of the benefits of hosted government payloads on commercial satellites. The Hosted Payload Alliance (HPA) will serve as a bridge between government and private industry to foster open communication between potential users and providers of hosted payload capabilities, the companies said in a statement. HPA Steering Committee members are Boeing [ BA], Intelsat General Corp., Iridium Communications Inc. [IRDM], Lockheed Martin [LMT], Orbital Sciences Corp. [ORB], SES WORLD SKIES U.S. Government Solutions [SESG], and Space Systems/Loral [LORL]. The companies expect to be joined by other satellite operators, satellite manufacturers and system integrators in a broad-based organization aimed at increasing awareness of hosted payloads to provide the government with timely and cost-effective space-based capabilities. "We believe there is a need for industry and government to work together to facilitate hosted payloads," said Don Thoma, chairman of the HPA Steering Committee. "An important goal of this group is to act as a source of subject- matter expertise to educate stakeholders in the public and private sectors on the numerous opportunities for hosted payloads on commercial launch spacecraft." Lance Lord, retired Air Force general and former commander of Air Force Space Command, said: "The time is right for the formation of the Hosted Payload Alliance. "The 2010 U.S. National Space Policy calls for public-private partnerships with the commercial satellite industry to fill potential gaps, specifically citing hosted payloads, which the public sector might not have the resources to provide. The policy statement also encourages federal departments and agencies to seek out nontraditional arrangements to leverage commercial capabilities. As government funding for important space-based sensor programs continues to be cut or postponed, private industry will be called upon to play an important role in providing affordable and timely capabilities to meet those mission needs." Lord said wider use of hosted payloads on commercial satellites can provide a timely and cost-effective pathway to space for a diverse range of missions. Applications include communications, Earth observation, remote sensing, research and development, space situational awareness and forecasting electromagnetic solar storms in space. The HPA Steering Committee met to draft a charter and establish goals during the Satellite 2011 conference in Washington, D.C. The group will hold its first organizational meeting in conjunction with the 2011 National Space Symposium in Colorado Springs, Colo., on April 11.

Hickman, 99- John Hickman, Ph. D. Associate Professor of Government Department of Government and International Relations Berry College, November 1999, “The Political Economy of Very Large Space Projects” JOURNAL OF EVOLUTION AND TECHNOLOGY, Volume 4, November 1999

Attempting to persuade investors to risk enough capital to finance the construction of a very large space development project would run up against the same capitalization problems now faced by entrepreneurs seeking capital for ordinary space development projects such as launching communication satellites. Investors and lenders seek to maximize economic returns from capital while avoiding risk. The cost of capital is higher for riskier investments. Persuading investors and lenders to part with their capital requires making credible promises that they will receive better returns than they would have received from making alternative investments during the same time period commensurate with risk. While investors often accept higher levels of risk than do lenders, they do so in the expectation of even better returns. Ordinary space development projects confront not only the risks that their businesses might not make money and that the technology might fail to work as projected, but also that they might not attract enough investment because the necessary capital investment is too “chunky.” In other words, the “up−front” capital investment necessary to proceed with even an ordinary space development project tends to be relatively large and to take a relatively long time period before generating cash flows or profits (Simonoff 1997: 73−74; U.S. Department of Commerce 1990: 55−60; McLucas 1991). It is important for the subsequent discussion that the reader note that many investors typically understand the phrase “long time period” to mean “5 years” (Marshall and Bansal 1992: 99−100).

Plan solves lack of capital

Hickman, 99- John Hickman, Ph. D. Associate Professor of Government Department of Government and International Relations Berry College, November 1999, “The Political Economy of Very Large Space Projects” JOURNAL OF EVOLUTION AND TECHNOLOGY, Volume 4, November 1999

The fundamental problem in opening any contemporary frontier, whether geographic or technological, is not lack of imagination or will, but lack of capital to finance initial construction which makes the subsequent and typically more profitable economic development possible. Solving this fundamental problem involves using one or more forms of direct or indirect government intervention in the capital market. When space development enthusiasts describe how permanent human communities might be established in space, they often draw analogies to the European colonization of the Americas and to the “winning” of the western frontiers of the United States and Canada, analogies which are often given a very contemporary libertarian spin. Complex historical processes are offered up as examples of the triumph of individualism and private enterprise. The unspun truth about European colonization in the Americas, and in Asia and Africa, is that the state played a central role in all colonial enterprises. European colonies often emerged out of trading ventures organized as joint stock companies chartered by the colonizing state and in which the crown invested both its prestige and its capital. Colonial territory was conquered and defended by soldiers and sailors paid either by the colonizing state or the local colonial state. Plantations and mines were often directly owned by the local colonial state. Trading monopolies and tax privileges granted by the colonizing state to the local colonial state were used to attract capital investment. Indeed, conceptual distinctions between public and private economic activity which seem so clear today were much less clear in the heyday of colonialism. The unspun truth about the “winning” of the western frontiers of the United States and Canada make for even poorer libertarian dramas. Notwithstanding all the hardy pioneers in their covered wagons, the western frontier of the United States was really “won” by the U.S. Army and the construction of the railroads which were capitalized by enormous Federal land grants.[5] Similarly, the western frontier of Canada was “won” by cash grants, subsidies, loans, and the guarantee of bond issues by the Canadian government to finance the construction of the railroads. A better historical analogy for establishing permanent human communities in space is actually provided by one of the greatest civil engineering project of this century−−the construction of the Panama Canal. As would be true with any very large space development project, constructing the Panama Canal required that tough new engineering and science problems had to be overcome in an unforgiving environment, a labor force had to be imported and supported, and sufficient capital had to be invested despite the fact that private investors could not or would not provide the financing necessary to complete the task. After twenty years of failed efforts by private French firms to dig a canal across the isthmus of Panama and the failure of a private American firm to dig a canal through Nicaragua, it was the United States government that successfully completed the construction of the Panama Canal.[6] Financing by the United States government and management by U.S. Army engineers succeeded where the private sector failed. Engineering problems more difficult than those which were encountered in constructing the Suez Canal were solved, yellow fever and malaria were effectively controlled, a new sovereign nation−state was created, and world commerce was facilitated.[7] Not bad for government work. Very large space development projects should be understood as massive public works projects constructed to provide the environmental and economic requirements for permanent human settlement beyond Earth. If these new human settlements are to attract and keep the kind of people needed, then they will have to be livable communities. Making them livable will provide plenty of scope for private firms to profit from the provision of goods and services. But private firms will not do the heavy lifting necessary to finance the construction of the very large space project within which and around which such a livable community may grow.

Need private investment for the moon Investors encouraged by US development of technologies

Schmitt 3- Harrison H. Schmitt has a doctorate in geology from Harvard University in 1964, former astronaut, November 6, 2003, “Testimony of Hon. Harrison H. Schmitt: Senate Hearing on "Lunar Exploration"”, http://www.spaceref.com/news/viewsr.html?pid=10924

Most important for a new NASA or a new agency would be the guarantee of a sustained political (financial) commitment to see the job through and to not turn back once a deep space operational capability exists once again or accidents happen. At this point in history, we cannot count on the Government for such a sustained commitment. This includes not under-funding the effort - a huge problem still plaguing the Space Shuttle, the International Space Station, and other current and past programs. That is why I have been looking to a more predictable commitment from investors who have been given a credible business plan and a return on investment commensurable with the risk. Attaining a level of sustaining operations for a core business in fusion power and lunar resources requires about 10-15 years and $10-15 billion of private investment capital as well as the successful interim marketing and profitable sales related to a variety of applied fusion technologies. The time required from start-up to the delivery of the first 100 kg years supply to the first operating 1000 megawatt fusion power plant on Earth will be a function of the rate at which capital is available, but probably no less than 10 years. This schedule also depends to some degree on the U.S. Government being actively supportive in matters involving taxes, regulations, and international law but no more so than is expected for other commercial endeavors. If the U.S. Government also provided an internal environment for research and development of important technologies, investors would be encouraged as well. As you are aware, the precursor to NASA, the National Advisory Committee on Aeronautics (NACA), provided similar assistance and antitrust protection to aeronautics industry research during most of the 20th Century.

# \*\*\*Hegemony\*\*\*

## Heg Impact

Decline causes nuclear war.

Alexei Arbatov 7 corresponding member of the Russian Academy of Sciences, member of the Editorial Board of Russia in Global Affairs, “Is a New Cold War Imminent,” Russia in Global Affairs, No. 2, July-September 2007, <http://eng.globalaffairs.ru/numbers/20/1130.html>

However, the low probability of a new Cold War and the collapse of American unipolarity (as a political doctrine, if not in reality) cannot be a cause for complacency. Multipolarity, existing objectively at various levels and interdependently, holds many difficulties and threats. For example, if the Russia-NATO confrontation persists, it can do much damage to both parties and  international security. Or, alternatively, if Kosovo secedes from Serbia, this may provoke similar processes in Abkhazia, South Ossetia and Transdniestria, and involve Russia in armed conflicts with Georgia and Moldova, two countries that are supported by NATO. Another flash point involves Ukraine. In the event of Kiev’s sudden admission into the North Atlantic Alliance (recently sanctioned by the U.S. Congress), such a move may divide Ukraine and provoke mass disorders there, thus making it difficult for Russia and the West to refrain from interfering. Meanwhile, U.S. plans to build a missile defense system in Central and Eastern Europe may cause Russia to withdraw from the INF Treaty and resume programs for producing intermediate-range missiles. Washington may respond by deploying similar missiles in Europe, which would dramatically increase the vulnerability of Russia’s strategic forces and their control and warning systems. This could make the stage for **nuclear confrontation** even tenser. Other “centers of power” would immediately derive benefit from the growing Russia-West standoff, using it in their own interests. China would receive an opportunity to occupy even more advantageous positions in its  economic and political relations with Russia, the U.S. and Japan, and would consolidate its influence in Central and South Asia and the Persian Gulf region. India, Pakistan, member countries of the Association of Southeast Asian Nations and some exalted regimes in Latin America would hardly miss their chance, either. A multipolar world that is not moving toward nuclear disarmament is a world of an expanding Nuclear Club. While Russia and the West continue  to argue with each other, states that are capable of developing nuclear weapons of their own will jump at the opportunity. **The probability of nuclear weapons being used** in a regional conflict **will increase significantly**. International Islamic extremism and terrorism will increase dramatically; this threat represents the reverse side of globalization. The situation in Afghanistan, Central Asia, the Middle East, and North and East Africa will further destabilize. The wave of militant separatism, trans-border crime and terrorism will also infiltrate Western Europe, Russia, the U.S., and other countries. The surviving disarmament treaties (the Non-Proliferation Treaty, the Conventional Armed Forces in Europe Treaty, and the Comprehensive Nuclear Test Ban Treaty) will collapse. In a worst-case scenario, there is the chance that an adventuresome regime will initiate a missile launch against territories or space satellites of one or several great powers with a view to triggering an exchange of nuclear strikes between them. Another **high probability** is the threat of a **terrorist act with the use of a nuclear device** in one or several major capitals of the world.

## EMP Impact

EMP attack would cripple US military and economic power --- ends leadership

Joseph Farah 5 – WND : World Net Daily, Iran plans to knock out U.S. with 1 nuclear bomb, 4-25-05, <http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=43956>

Last month, the Senate Judiciary Subcommittee on Terrorism, Technology and Homeland Security chaired by Kyl, held a hearing on the Electromagnetic Pulse, or EMP, threat.  "An electromagnetic pulse (EMP) attack on the American homeland, said one of the distinguished scientists who testified at the hearing, is one of only a few ways that the United States could be defeated by its enemies – terrorist or otherwise," wrote Kyl "And it is probably the easiest. A single Scud missile, carrying a single nuclear weapon, detonated at the appropriate altitude, would interact with the Earth's atmosphere, producing an electromagnetic pulse radiating down to the surface at the speed of light. Depending on the location and size of the blast, the effect would be to knock out already stressed power grids and other electrical systems across much or even all of the continental United States, for months if not years."  The purpose of an EMP attack, unlike a nuclear attack on land, is not to kill people, but "to kill electrons," as Graham explained. He serves as chairman of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack and was director of the White House Office of Science and Technology Policy and science adviser to the president during the Reagan administration.  Graham told WorldNetDaily he could think of no other reason for Iran to be experimenting with mid-air detonation of missiles than for the planning of an EMP-style attack.  "EMP offers a bigger bang for the buck," he said. He also suggested such an attack makes a U. S. nuclear response against a suspected enemy less likely than the detonation of a nuclear bomb in a major U. S. city.  A 2004 report by the commission found "several potential adversaries have or can acquire the capability to attack the United States with a high-altitude nuclear weapons-generated electromagnetic pulse (EMP). A determined adversary can achieve an EMP attack capability without having a high level of sophistication."  "EMP is one of a small number of threats that can hold our society at risk of catastrophic consequences," the report said. "EMP will cover the wide geographic region within line of sight to the nuclear weapon. It has the capability to produce significant damage to critical infrastructures and thus to the very fabric of U. S. society, as well as to the ability of the United States and Western nations to project influence and military power."

## Taiwan War Uniq

Taiwan conflict’s coming --- Chinese space mil takes out US advantages

Dr Graham Ong-Webb 11, 3-15**,**  a Managing Editor with IHS Jane's & PhD from the Department of War Studies, King's College London, “How Far Will China's Navy Reach?”, <http://www.isn.ethz.ch/isn/Current-Affairs/ISN-Insights/Detail?lng=en&id=127560&contextid734=127560&contextid735=127476&tabid=127476>

Not only economic interests but also geopolitical ones are fueling China's naval prowess, particularly in the Taiwan Straits - the most likely naval flashpoint. Beijing's option to unify Taiwan with the mainland by military force if necessary is no longer fuelled by ideology but geopolitics. As a 2008 US government report correctly put it, Taiwan is regarded as the focal point from which China can 'break out' from its centuries-long containment along the Pacific littoral" and secure its immediate security environment within the Asia-Pacific region. This 'line of containment' is also known as the oft-mentioned "first-island chain" running south from the Japanese archipelago to the Philippines, which naturally denies the mainland from having unfettered access to the oceanic thoroughfare. **The possession of Taiwan** would permanently break China's geographical curse. As a result, the Taiwan Straits - as well as the South China Sea and the Yellow Sea - have become pressing geopolitical priorities **that drive China's expansive military planning and procurement.** Naval prowess - only one head of the hydra Moreover, it must be said that China's growing 'naval power' is not only about an expanding fleet of ships and submarines. All militaries advancing towards greater sophistication seek to integrate their sea, air, land and space capabilities in order to **increase overall lethality, efficiency and effectiveness.** The Chinese Navy is but one head of the country's military hydra. In a larger sense, the Chinese Navy should be regarded as a placeholder for the sea, air, land, and space-related capabilities that **China will bring to bear against an adversary in the maritime realm of conflict.** US strategic planners have been increasingly concerned with China's recent development and impending deployment of certain air, land, and space-related capabilities, which **affect Taiwan's ability to impede a Chinese naval advance** toward its shores and also the **US Navy's capacity to project its military power in the Straits**. Some of these developments include an aircraft carrier, anti-ship ballistic missiles, stealth fighter-aircraft and anti-satellite missiles. In January, the Chinese media published a video of China's first aircraft carrier undergoing sea trials. The bid to field a Chinese aircraft carrier may look like an unwieldy proposition because of the indomitable presence of 11 US aircraft carrier groups policing the world's oceans. The Chinese carrier, which is an upgraded version of a partially-built vessel purchased from Ukraine in 1998, is generations behind American carrier technology. However, China's plan to field an aircraft carrier since the 1990s is not an arms-race-type rejoinder to the US. It is simply borne out of a pragmatic need to use carrier-based aviation to better protect China's surface fleet. The Chinese Navy has calculated that an aircraft carrier with 40 aircraft on board would generate a combat effectiveness of between 200 and 800 land-based fighters in air-support functions. A Chinese carrier, supported by a fleet of attack submarines, may allow the rest of the Chinese Navy to secure an area up to the 'second-island chain' stretching from the Aleutians to Papua New Guinea. China's fledgling anti-ship missile capability threatens US aircraft carriers. In early January, the US Navy's intelligence director acknowledged that China's anti-ship ballistic missile, the DF-21D, had finally reached its initial operating capability, **leaving US carriers open to attack**. Previously, US observers were sceptical that Chinese engineers could master the complicated science of hitting a manoeuvrable target such as a moving aircraft carrier. With the impending deployment of the DF-21D, its immediate role would be to **deter the US Seventh Fleet from approaching the Taiwan Strait**. The key target would be the USS George Washington, the aircraft carrier assigned to this fleet **which carries the US Navy's best strike** aircraft capable of attacking Chinese sea, air and land targets and destroying vital Chinese radar systems. These carried-launched aircraft have a range of less than 1,000 kilometers. Therefore, the DF-21D, which shares a similar range, is intended to keep the aircraft belonging to the George Washington out of lethal range. The US and Taiwanese airborn-early-warning aircraft that support their respective navies are also **not immune from attack.** It was reported in early January that the Chinese military successfully test flew their own indigenously-built fifth-generation stealth fighter aircraft known as the J-20 "Black Eagle", designed to creep up and destroy those aircraft that **would otherwise provide real-time intelligence and surveillance of a Chinese naval attack**. Until recently, US officials have played down China's ability to make advances on its J-20 program launched in the 1990s. In fact, the American defence community previously estimated that the J-20 would be operational only around 2020 when it is more likely to be ready in about three years from now. Lastly, the Chinese military is very close to fielding an anti-satellite missile capability that stands to cripple the network of satellites that the US military depends upon to marshal and **coordinate its air, land and naval forces effectively**. Chinese military planners realize that the US military satellite and communications network is both its greatest strength and greatest weakness. While it makes the US military more effective and efficient, it is also reduced to fighting 'blind, deaf and dumb' without it. In January 2007, Beijing successfully destroyed one of its own weather satellites with a direct ascent anti-satellite missile, based on the same missile airframe used for the DF-21D, hence proving that it could obliterate US satellites in low earth orbit. These developments bolster the Chinese military's confidence in **achieving what it views to be its national security imperatives. Whether or not China does possess hegemonic aspirations**, it is becoming clear that Beijing is **removing the shackles** that previously placed limits on its strategic reach. In particular, as a recent US Office of Naval Intelligence report has noted, the Chinese Navy has begun removing the geographical limits to its 'offshore defense' thinking. It appears to have been given the mandate to venture "as far as [its] capabilities will allow it to operate task forces out at sea with the requisite amount of support and security." The deployment of a Chinese naval convoy to the Gulf of Aden to protect the country's shipping from Somali pirates in early January is instructive. The question that should now be asked **is how much maritime security is really enough for Beijing.** The answer determines how far Beijing will ask its navy to go.

## Solvency: Heg

SMD reinforces hegemony in all spheres

Space & Missile Defense Report 9 --- May 4, 2009, “New Report: Mutual Assured Destruction Won't Work Because Too Many Rogue Actors Gain Nuclear Capabilities, While Developing Intercontinental Ballistic Missiles” Vol. 32 No. 18

The concept of mutual assured destruction that successfully protected the United States from nuclear destruction by the old Soviet Union won't work to shield America from rapidly rising threats posed by rogue nations and terrorist groups, a major new report states. "An unprecedented number of international actors have now acquired -- or are seeking to acquire -- ballistic missiles and weapons of mass destruction," according to the 237-page report described in a Capitol Hill forum by Baker Spring, research fellow with the Heritage Foundation, a Washington think tank. The report was published for the Independent Working Group, in which Spring is a member, by the Institute for Foreign Policy Analysis, of Cambridge, Mass., and Washington, D.C. In the report, steadily increasing missile capabilities of Iran, North Korea, China, Russia, Pakistan and Syria, and their nuclear weapons capabilities, are described in detail. The report asserts that **the U**nited **S**tates**, if it is to retain its leadership in military and other spheres, must maintain its preeminence in space, including a space-based missile defense.** Retaining that premier position in space is "not an option, but rather a necessity, for if not the United States, some other nation, or nations, will aspire to this role, as several others already do," the report states. "For the United States, space is a crucially important twenty-first century geopolitical setting that includes a global missile defense." Spring told an American Foreign Policy Council forum that the United States requires a robust sea-based missile defense system to protect both East and West Coast areas, which would include an upgrade of the Standard Missile-3 interceptor mounted in vertical launch system tubes aboard Navy ships, able to hit longer-range enemy missiles, even in their boost phase just after launch. Currently, Secretary of Defense Robert Gates has cast U.S. boost phase programs into doubt, refusing to fund any further planes for the Airborne Laser missile defense program, with questions abounding as to the fate of the Kinetic Energy Interceptor, the other boost-phase program.

SMD maintains stability and reinforces hegemony

**Lambakis 7**—Steven Lambakis, senior analyst in spacepower and policy studies at the National Institute for Public Policy, February 1, 2007, “Missile Defense From Space” Hoover Institution, Policy Review No. 141, online: http://www.hoover.org/publications/policy-review/article/6124

Policy consequences The policy benefits of a space-based missile defense layer are straightforward. A more effective missile defense system that fully leverages space would provide a true on-call global defensive capability, and this could lead to increased stability in the world. Defenses deter attacks by reducing confidence in the success of any attack. The more effective the missile defense system is, the greater will be its deterrence value, and the less likely will we be to have to use it at all. At some point, when the system is seen by other governments as highly effective, they could recognize a diminishing marginal rate of return in their own ballistic missile investments. As more allies invest in missile defense, U.S. space-basing activities could build on current missile defense cooperative activities and open up new avenues for international collaboration, both to develop elements of the space-based layer and to participate in operations. Moreover, because no state can have sovereignty over the space above its territory, we could operate up there free of political constraints. The need for negotiating basing rights to locate sensors or interceptor fields would become less pressing. Improved system performance would give the U.S. leadership a better array of options. In the face of attempted blackmail, for example, the president and his advisors would have confidence in the nation’s capabilities to defeat a missile, which would make it possible to avoid more destabilizing moves, such as offensive preventive attacks on enemy territory. It is equally true that strong defenses would support necessary offensive action. Effective defenses can buy time to understand the strategic consequences and overall impact of military action. Our choices are fundamental to making moral judgments. The moral issues surrounding a national security crisis are tied to considerations of operational effectiveness. Are we doing our best to provide protection against some of the worst weapons imaginable? What would the consequences of not acting be, or of not being able to act because of a blackmail threat? What would be the result if Washington were unable to respond to increased terrorist activity worldwide or an upswing in the global weapons of mass destruction trade? A space-based layer would reinforce American strength, which in turn would allow the U.S. to better defend its interests and pursue its foreign policy goals. A powerful and influential United States is good for world peace, stability, and enforcing the rule of law internationally.

Weapons key to hegemony—stabilizes commercial development

**Dolman 6**—Everett Carl Dolman, PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies, March 10, 2006, “Toward a U.S. Grand Strategy in Space” George Marshall Institute, pg 26-27

Dolman: If we went with the projected budgets in DOD, you have to make severe cuts in other conventional capabilities. That is the only way. Otherwise you would have to extend the DOD budget; there is no question of that. I am glad that Karl brought up an example that I have used in the past. The counter-arguments are either that these weapons would give such a tremendous advantage to the United States that all other nations would be under our imperial thumb and thus they must oppose it, or that they are far too expensive and technically improbable and they will actually accelerate the decline of the United States, in which case all other nations should probably go, "Excellent! That works for us!" It is one of the two, or actually it is somewhere in between. But I think it will be opposed - though other states will not oppose the United States head-to-head in space, or in like terms, but they would probably do something economic (embargo, trade restrictions, etc.). Barring those other types of non-symmetrical opposition to the United States, there would certainly be diplomatic efforts to prevent the United States from doing so. And if I were advising any one of those states, I would tell them to oppose US actions as well. But they will find that over the time in which the United States has continuing control of outer space, allowing all other states to enter into space for non-military reasons and in fact encouraging that, that changing the current outer space regime to enhance commercialization of space will increase the welfare that comes from space - to all states. All analogies are flawed, but they do bring up some ideas. The British kept pirates from the seas and enhanced safety of the seas during their hegemony and the Athenians did the same in their period of Aegean hegemony. Commerce increased because the likelihood of getting profits from the sea were greater when there was a hegemonic power protecting the extant rule of law and eventually it would be seen, and not in too long of a term, that the United States' continuing hegemony over space would be a global public good. Thus space control is not an imperial overstretch, but a structural means to continue the hegemonic status quo.

Space capabilities are key to broader economic/technological/military leadership – China rising now

**Campbell 9**- Keven T. Campbell, Commander of the U.S. Army Space and Missile Defense Command, 2009, “Asymmetrical Challenges Technology in an Era of Persistent Conflict” Army Space Journal-11th Annual SPACECOMM Defending America Symposium, pg 28

The chief of staff of the Army has described the attributes he wants to see in our forces. He wants us to be versatile... move from the offense to the defense to stability rapidly; to be expeditionary; to respond to the unanticipated and operate in an austere environment; to be agile ... that is to exploit their seams in complex environments whether that's cyber or physical; to be lethal, both using non-lethal means and lethal means; to be interoperable. We know that our forces can't achieve all that without Space capabilities and a lot of that is tied to communications paths. We know that terrestrial, airborne and even high altitude areas that we're starting to dabble in carry us only so far. We understand the profound impact that Space capabilities have on all aspects of our operations, and our leadership in Space is certainly being challenged. I think it's evident to all of us as Americans. In retaining our superiority, it's not just a military imperative, it's a national imperative. The recently completed Allard Commission study found that **our Space capabilities** — and this is no surprise to anyone — they **underpin** **our U.S. economic, technological and military leadership**; that our global leadership is in jeopardy because global access to technology is leveling, that potential adversaries are gaining competitive advantages, and they observe the emergence of China as a Space power. That's sort of the "dull" observation, but nonetheless it's mere. The commission members went on to say the U.S. military strategy, our concepts, our force structure, and our employment are all predicated on superior Space capabilities, and as we see an increased reliance on this, we know it's becoming a contested environment. Bruce McDonald wrote in the Council on Foreign Relations Report, September 200S, that the People's Liberation Army envisions a conflict in Space, and they're preparing for it. Now at the same time we recognize these Space capabilities are foundational, we also recognize the potential vulnerability in exclusive dependencies.

SMD key to heg/ deterrence –dissuades foreign BMD development –can take out BMD during boost phase

**Institute for Foreign Policy Analysis 9** – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

There is ample reason for concern. The threat environment confronting the United States in the twenty-first century differs fundamentally from that of the Cold War era. An unprecedented number of international actors have now acquired - or are seeking to acquire - ballistic missiles and weapons of mass destruction. Rogue states, chief among them North Korea and Iran, place a premium on the acquisition of nuclear, chemical, and biological weapons and the means to deliver them, and these states are moving rapidly toward that goal. Russia and China, traditional competitors of the United States, continue to expand the range and sophistication of their strategic arsenals at a time when the United States debates deep reductions in its strategic nuclear forces beyond those already made since the end of the Cold War and has no current modernization program. With a new administration, furthermore, the future development of even our limited missile defense system is in question. Furthermore, a number of asymmetric threats - including the possibility of weapons of mass destruction (WMD) acquisition by terrorist groups or the devastation of American critical infrastructure as a result of electromagnetic pulse (EMP) - now pose a direct challenge to the safety and security of the United States. Moreover, the number and sophistication of these threats are evolving at a pace that no longer allows the luxury of long lead times for the development and deployment of defenses. In order to address these increasingly complex and multifaceted dangers, the United States must move well beyond the initial missile defense deployments of recent years to deploy a system capable of comprehensively protecting the American homeland as well as U.S. overseas forces and allies from the threat of ballistic missile attack. U.S. defenses also must be able to dissuade would-be missile possessors from costly investments in missile technologies, and to deter future adversaries from confronting the United States with WMD or ballistic missiles. America's strategic objective should be to make it impossible for any adversary to influence U.S. decision making in times of conflict through the use of ballistic missiles or WMD blackmail based on the threat to use such capabilities. These priorities necessitate the deployment of a system capable of constant defense against a wide range of threats in all phases of flight: boost, midcourse, and terminal. A layered system - encompassing ground-based (area and theater anti-missile assets) and sea-based capabilities - can provide multiple opportunities to destroy incoming missiles in various phases of flight **A truly global capability,** however, **cannot be achieved without a missile defense architecture incorporating interdiction capabilities in space as one of its key operational elements**. In the twenty-first century, space has replaced the seas as the ultimate frontier for commerce, technology, and national security. Space-based missile defense affords maximum opportunities for interception in boost phase before rocket boosters have released warheads and decoys or penetration aids. The benefits of space-based defense are manifold. The deployment of a robust global missile defense that includes space-based interdiction capabilities will make more expensive, and therefore less attractive, the foreign development of offensive ballistic missile technologies needed to overcome it. Indeed, the enduring lesson of the ABM Treaty era is that **the absence of defenses, rather than their presence, empowers the development of offensive technologies that can threaten American security and the lives of American citizens.** And access to space, as well as space control, is key to future U.S. efforts to provide disincentives to an array of actors seeking such power.

SMD is key to heg

Deterrence

Geopolitics/military/economic status

**Institute for Foreign Policy Analysis 9** – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

**The current state of affairs** surrounding missile defense carries profound implications for the safety and security of the United States, and its role on the world stage in the decades to come. Without the means to dissuade, deter, and defeat a growing number of strategic adversaries, the United States will be unable to maintain its status of global leadership. The creation of effective defenses against ballistic missile attack remains central to this task. Historically, it is evident that the major geopolitical options that become available have been exploited by one nation or another. Those nations that are most successful in recognizing and acting on such options have become dominant. Others that have failed or have consciously decided not to do so are relegated to inferior political status. A salient case in point is ocean navigation and exploration. The Chinese were the first to become preeminent in this retrospectively pivotal area during the early Ming dynasty. However, domestic politics - strongly resembling missile defense politics in the United States of the past several decades - allowed this great national lead to be dissipated, with historic consequences felt until the present day, a full half millennium later. The subsequent assumption by Portugal of this leading maritime role resulted in geopolitical preeminence that was eventually lost to other powers. In the twenty-first century, maintenance of its present lead in space may indeed be pivotal to the basic geopolitical, military, and economic status of the United States. Consolidation of the preeminent U.S. position in space akin to Britain's dominance of the oceans in the nineteenth century is not an option, but rather a necessity, for if not the United States, some other nation, or nations, will aspire to this role, as several others already do. For the United States, space is a crucially important twenty-first century geopolitical setting that includes a global missile defense.

## Solvency: Forward Presence

Potential advantage/maybe different plan mandate- SBMD, solves deterrence

Frederick 9 – Lt Col Lorinda A. Frederick, USAF, BA, Michigan State University; MBA, Regis University; Master of Military Operational Art and Science, Air Command and Staff College; Master of Airpower Art and Science, School of Advanced Air and Space Studies, 9/1/09, “Deterrence and Space-Based Missile Defense,” Air and Space Power Journal, Fall 2009

Many characteristics of SBMD could create uncertainty in the minds of potential adversaries about whether or not they could achieve their aims.48 Space provides access to threats in areas that terrestrial, maritime, and airborne defenses cannot reach. SBMD is capable of destroying ballistic missiles over the enemy’s territory before they release multiple reentry vehicles or countermeasures designed to thwart defenses. The constant forward presence of SBMD could allow the United States to limit its military footprint on foreign soil and support many military operations simultaneously. Land- and sea-based interceptors have to be placed in areas where they can provide credible protection from ballistic missile attacks. Pre-positioning infrastructure, supplies, and equipment may shorten response times when hostilities erupt, but they are costly and difficult to sustain. SBMD allows a nonintrusive forward presence because it does not require the pre-positioning of assets on other territories. Furthermore, employing SBMD is not contingent on approval from another nation. The continued presence of US assets on foreign soil depends on the host nation’s accepting or approving the mission that those assets support. If defenses are not in position, deterrence is reduced. Stationed in the right orbits in the right quantities, SBMD could deter or defend against attacks around-the-clock, especially if used in concert with other sea- and land-based missile defenses.

## Solvency: Space Leadership

Space Leadership--- private sector innovation and control over space

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Access to a secure space environment is indispensable if the United States is to deploy a robust, layered missile defense. It is essential not only to assure that the United States will be able to use space for missile defense, but also to develop the means to protect other space-based assets and infrastructure. Space has become an arena of crucial importance to the United States both for commercial purposes and for national security. Just as it must maintain capabilities to defend its interests in the air, at sea, and on land, the United States needs to defend its space-based assets. At the same time we must deny the hostile use of space by our enemies. Just as land, the seas, and the air have been conflict arenas, space is changing how wars are fought and where they will be fought. This section addresses the role of space in twenty-first century U.S. national security strategy and its essential contributions to future missile defense. Space offers unique opportunities for a global missile defense. The obstacles to space-based missile defense lie primarily in the political arena rather than in technological limitations. This section examines issues that must be addressed if the United States is to deploy a missile defense that includes space-based interdiction capabilities. Present U.S. Space Strengths The United States is the leading space power, and as such it depends more on space than does any other nation, a situation that leads inevitably to both vulnerabilities and opportunities. The U.S. position in space has grown out of numerous strengths developed over more than five decades. These strengths fall into two broad, overlapping categories: (1) military force enhancement; and (2) commercial utilization of space. Because of the dual-use nature of these technologies, it is not easy to separate their military applications from their commercial ones. Therefore, the failure of the United States to remain in the forefront of space technologies would have both military and commercial implications. Advances in the military or civilian sectors will overlap, intersect, and reinforce each other. Consequently, the development in the United States of a dynamic and innovative private-sector space industry will be indispensable to future U.S. space leadership. Nevertheless, the ability of the U.S. military to contribute to, and benefit from, such a space technology base will depend on its focus and priorities. The availability of technologies does not lead inevitably to their exploitation. America may fail to move forward to exploit technological opportunities and breakthroughs. Such choices may be based on political or other considerations, whether well founded or the product of mistaken assumptions about what competitors or adversaries will or will not do. Just as control of the seas has been essential to the right of innocent passage for commerce, the ability of the United States to maintain assured access to space and freedom of action in space will depend on space control. Given the already extensive importance of space for commercial and military purposes, as well as its prospective role in missile defense, the United States must maintain control of space in the twenty-first century. This commitment to space control is neither new nor destabilizing, despite claims to the contrary.

## Solvency: Afghan/Iraq War

Protecting space assets = military interconnectedness –Afghan COIN - Iraq

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The United States must protect its critically important space systems, which are obvious targets for future adversaries who will seek to eliminate the edge those assets give our military forces. This asymmetric U.S. advantage is well known to even limited powers who confront U.S. interests, and they will inevitably strive to reduce that advantage if they seek to attack the United States - and today's technology makes that possibility a serious concern. Perpetuating the well-known vulnerability of U.S. space assets is, therefore, an unacceptable security risk. The crucial importance of space was clearly highlighted in the early 1990s by the results of the first Gulf War - which the then-Air Force chief of staff, General Merrill McPeak, called the first "space war."5 More recently, space-based assets, including communications and surveillance systems and sensors, again were essential to the rapid and decisive military victory in Iraq. Operation Iraqi Freedom would have been impossible to conduct with lightning speed and low casualties in the absence of space-based assets providing for unprecedented connectivity among intermitted military systems.6 U.S. space systems are also playing a vital role in the current counter-insurgencies in Afghanistan and Iraq. The importance of space systems for the United States and its allies lies in their utter ubiquity throughout the spectrum of conflict at the tactical, operational, and strategic levels of war. The overriding importance of space to our national security was underscored in January 2001 by the "Report of the Commission to Assess United States National Security Space Management and Organization" (the Space Commission) headed by Donald Rumsfeld. How the United States develops space for civil, commercial, defense, and intelligence uses will have profound implications for national security in the next several decades. The commission emphasized that the United States has key national security interests in: • Promoting the peaceful use of space • Using space to support U.S. domestic, economic, diplomatic, and national security objectives • Developing and deploying in space the means to deter and defend against hostile acts against U.S. space assets and against the use of space for activities hostile to U.S. interests The commission concluded that "the present extent of U.S. dependence on space, the rapid pace at which this dependence is increasing, and the vulnerabilities it creates, all demand that U.S. national security space interests be recognized as a top national security priority."7

## Space Challengers: China

**China will challenge US—space capability is easier that nuclear**

MacDonald 8—Bruce MacDonald, MS in Aerospace Engineering and International Relations and senior director of the Nonproliferation and Arms Control Program with the USIP Center for Conflict Analysis and Prevention, “China, Space Weapons, and US Security” Council of Foreign Relations Report No. 38, pg 6-8

China has been developing a significant military and civilian space capability since 1955. This effort was led by Tsien- Hsue-shen, a brilliant U.S.-trained rocket scientist who cofounded the U.S. Jet Propulsion Laboratory at Caltech, but whom the United States deported to China during the excesses of the McCarthy era. While Dr. Tsien helped China develop ballistic missiles to improve its nuclear deterrent, Beijing has mainly concentrated on economic development in the past three decades: Of Deng Xiaoping's "Four Modernizations," national defense received the least priority. Recently, though still focused on economic growth, China has been building its military strength, including multiple offensive counterspace options, with the U.S. Department of Defense noting China's "multidimensional program to generate the capability to deny others access to outer space."3 Well aware of its military inferiority to the United States, **China** **is** likely doing what countries in comparable security situations do: **developing military capabilities targeted against** **the vulnerabilities of its stronger potential adversary. The** **U**nited **S**tate**s'** relative **space advantage will** probably **shrink as China strengthens its space capabilities** over the next ten to twenty years.The voluminous People's Liberation Army (PLA) literature on space conflict underscores that PLA officers are explicitly interested in space weapons. But Chinese military writings are no more likely to accurately reflect Beijing's policy than midlevel U.S. military writings would Washington's official policy. However, arguments that this PLA literature is merely academic lost some credibility in the aftermath of China's 2007 ASAT test. It is unclear whether China's offensive counterspace capabilities are intended for deterrence or as usable weapons of war, though deterrence is repeatedly discussed. As a possible precedent, China's strategic nuclear policy has been one of minimum deterrence and declared "no first use." The small Chinese nuclear force is not meant to wage war, but is capable of destroying a few cities, a capability that allows China to resist potential foreign coercion. **However, space and nuclear deterrence are not the same.** Because the effects are not as devastating as the detonation of a nuclear weapon, crossing the space weapons "threshold" is easier, especially if the effects are temporary. Some PLA writings suggest China is considering a "no first use" space weapons policy, though the lower level of destruction in space conflict makes it more likely China would preempt in space if it were advantageous to do so. Some PLA authors see space conflict as a natural evolution of military technology, and space weapons as desirable for China, though others appear to adopt a more deterrence-oriented framework for these weapons. Some in the PLA directly connect Chinese doctrine on strategic nuclear forces with that on space weapons, urging the same "minimum deterrence" doctrine.4 Chinese leader Mao Zedong was explicitly quoted on China's 1975 nuclear policy: "We will not attack unless we are attacked. If we are attacked, we will certainly counterattack."

China is challenging the US in space—it’s trying to take out our MilSATS

Deptula 11 – David Deptula, MS in National Security Strategy and Lt Col. Deputy Chief of Staff for Intelligence, Surveillance and Reconnaissance, Headquarters U.S. Air Force, January 27, 2011, "China's Active Defense Strategy and its Regional Impact" U.S.-China Economic & Security Review Commission, pg 4-5

China recognizes the overwhelming advantage the US has in the space domain and its key role in our ability to collect, analyze and rapidly share data. They understand how dependent U.S. warfighters have become upon space products and services for commanding deployed troops, passing ISR data, and enabling precision targeting and engagement. **China views that reliance as a significant, exploitable vulnerability and has written extensively about the subject in both** open source **journals and military** **doctrine**. As a result, **they are actively pursuing a comprehensive array of space and counterspace programs** intended to degrade, disrupt, deny or destroy our ability to gain and maintain access to the region in the event of a conflict. Space Weapons China maintains a development and deployment program for space weapons including programs on direct ascent anti-satellite (ASAT) weapons, high energy laser (HEL) and dazzlers and GPS and other types of jammers. **The PRC is developing these weapons and technologies as a way to counter U.S. space superiority and to deny the use of space**. China understands the U.S. reliance on space for imagery, signals intelligence, communication, tracking of friendly forces and navigation. As such, they are developing the capabilities to deny the U.S. information at the time of their choosing. Additionally, the threat of space denial, such as through the testing of ASAT weapons, is also an effective counterspace strategy. ASAT Weapons China understands how the U.S. uses our large fleet of military and intelligence satellite systems to find. fix. target and track Chinese military forces, then use our array of communication satellites (COMSATs) to pass that data to our deployed forces and finishing with our GPS navigation satellites (NAVSATs) to target and engage with precision. In January 2007. China successfully tested a direct ascent (DA) ASAT missile against a Chinese weather satellite, demonstrating its ability to attack satellites operating in low-Earth orbit (LEO). This test has been widely viewed as a direct challenge to U.S. space superiority. In addition to ASAT, the PRC is researching methods of co-orbital interception to target our NAVSATs and COMSATs. Co-orbital ASATs will provide China with a broad range of options beyond kinetic attack to counter our space-enabled, information advantage. For example, in June 2010. China launched the Sliijian-12 (SJ-12) satellite from Jiuquan Satellite Launch Center in north-central China. According to the State media seivice Xinhua. SJ-12's mission is to carry out "scientific and technological experiments". However, between Jun 20 and Aug 16. SJ-12 conducted a series of maneuvers to rendezvous with SJ-06F, an older Chinese satellite launched in Oct 08. SJ-12 made many close approaches with less than 984 feet between the two satellites. China could conceivably want to experiment with close space maneuvers, given its plans to build a space station that would require continuous resupply. However, the lack of official Chinese information about the maneuvers has allowed room for speculation that China has now demonstrated a capability with potential application to co-orbital ASAT capability.

PLA officials prove

**Listner 4/25/11** – Michael Listner, JD in Space Law and legal and policy analyst with a focus on issues relating to space law and policy, “An exercise in the Art of War: China’s National Defense white paper, outer space, and the PPWT” The Space Review, online: http://www.thespacereview.com/article/1828/1

PRC’s perception of the United States’ space power “If you know the enemy and know yourself, you need not fear the outcome of a hundred battles.”2 The United States is in a unique position among the nations of the world regarding the development of and the reliance upon its outer space systems. These systems not only provide national security functions, but also support the economy and civilian sector as well. It is this reliance that makes those outer space systems particularly vulnerable. The PRC recognizes both this reliance and vulnerability. The PRC also understands that the best way to counter this advantage is to deny the United States the use of its space systems. A 2007 report to Congress from the State Department’s Foreign Affairs, Defense, and Trade Division3 addressing the PRC’s January 11, 2007, ASAT test quoted the Chairman of the Joint Chiefs of Staff at the time, General Peter Pace. At a March 7, 2007, news conference regarding the ASAT test, General Pace notes several comments made by PRC military and foreign policy personnel concerning the threat of the United States’ outer-space systems to the PRC’s national security: “Various **comments by PLA officers and PRC civilian analysts have justified the ASAT test as needed to counter perceived U.S. ‘hegemony’ in space and target the vulnerability of U.S. dependence on satellites.**” “A PLA Air Force colonel wrote in late 2006 that U.S. military power, including long-range strikes, have relied on superiority in space and that leveraging space technology can allow a rising power to close the gap with advanced countries more rapidly than trying to catch up.” “A PRC specialist at Fudan University indicated that China’s ASAT program is developed partly to maintain China’s nuclear deterrence, perceived as undermined by U.S. space assets.”

Heg Challengers—China is developing space/ BMD/ cyber capabilities to undermine US heg

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According to the Defense Department, "China has the most active ballistic missile program in the world. It is developing and testing offensive missiles, forming additional missile units, qualitatively upgrading certain missile systems, and developing methods to counter ballistic missile defenses."\*6 PRC missile modernization efforts build upon current capabilities that encompass ballistic missiles able to target the United States as well as Japan and other regional U.S. allies. For example, China has over 46 Dong-feng 4, Dong-feng 5, and Dong-feng x intercontinental ballistic missiles, approximately 35 intermediate-range (Dong-feng % and Dong-feng 21) missiles, and hundreds of short-range rockets currently deployed.'7 Between 990 and 1,070 SRBMs are deployed opposite Taiwan, and the People's Liberation Army is increasing this force by more than 100 missiles each year.48 At the same time, China is in the midst of a massive, multi-year strategic-military modernization program, encompassing air power, naval, and land force capabilities, air defense, and electronic-, information- and space-warfare technologies.49 As part of this effort, China is upgrading its existing ballistic missile arsenal. This includes the deployment of its Dong-feng$i and Dong-feng31A ICBMs with multiple independently targetable re-entry vehicle (MIRV) warhead technology designed to defeat primitive anti-missile systems, priority solid-fuel propellant research intended to provide Beijing with immediate "launch on command" capabilities, and the transformation of its strategic offensive forces from large, stationary missiles to more versatile road-and rail-mobile variants. Notably, a successful flight test of China's new submarine-launched version of the Dong-feng 31, the]ulang% was conducted in June 2005.50 The julangi has a range of up to 9,600 kilometers and, according to the U.S. Air Force's National Air Intelligence Center, "will, for the first time, allow Chinese [missile submarines] to target portions of the United States from operating areas located near the Chinese coast."51 These capabilities are even more troubling in light of remarks made by Chinese Major General Zhu Chenghu, who declared that nuclear weapons would have to be used if the United States intervened militarily in a conflict over Taiwan.52 In addition, China has also begun to undermine American space dominance and is developing asymmetrical options to exploit perceived US. vulnerabilities in space. These include a variety of space-denial capabilities, as well as space assets and launch systems that will significantly augment Beijing's space operations. For example, in the wake of its successful October 2003 launch of the Shenzhou V spacecraft, China is developing advanced military capabilities as part of an exo-atmospheric "deterrent" force even while Beijing warns against any U.S. weaponization of space. In January 2007, China successfully destroyed a Chinese weather satellite using a direct-ascent, anti-satellite weapon, indicating its ability to attack satellites operating in low-earth orbit. Beyond the hit-to-kill technology demonstrated in this operation, the PRC is also developing technologies to "jam, blind, or otherwise disable satellites."53 China has also developed a range of "nano-satellite" technologies for space warfare, apparently for the purpose of crippling American space assets.54 Other Chinese advances in space include the Ziytian 1 and Ziyuan i remote-sensing satellites and the development, through a joint venture between China's Tsinghua University and the United Kingdom's University of Surrey, of a constellation of seven mini-satellites (weighing between 101 and 500 kilograms) with 50-meter-resolution remote-sensing payloads.55 Furthermore, there is growing evidence that China is increasingly interested in developing an EMP capability, both as a theater weapon for use in a potential Taiwan conflict and as a strategic asset to counter the United States.56 Beijing's space achievements also include the Shenzhou VII, the third Chinese manned spaceflight, together with China's first spacewalk in September 2008." In addition, China is working on in-orbit rendezvous and docking procedures (which also have direct applications for ASAT and space-denial missions), and exploring the prospects for a manned space station. The Shenzhou VII mission and space-walk will provide China with docking techniques required for the construction of a space station that will reportedly be accomplished by joining two Shenzhou vehicles together. Moreover, the PRC has an elaborate lunar exploration program that includes an unmanned moon lander, a sample return mission, and an eventual human mission to the moon. For these missions, Beijing is developing a new Long March V booster. The timetables for the Chinese unmanned moon landing, a sample return mission, and a manned lunar mission are believed to be 2012,2015, and 2017, respectively. China's manned moon mission is approximately three years ahead of the U.S. target date for returning to the moon. Another extremely troubling development is the PRC's increasing efforts in the realm of cyber warfare, particularly as a means to attack U.S. infrastructure, computers, and associated networks. Such asymmetrical efforts underscore Beijing's understanding of the increasing role played in U.S. military operations by command, control, communication, computers, intelligence, surveillance, and reconnaissance (OISR) systems. The objective of the PRC is to establish electronic dominance early in any conflict scenario in order to disrupt and downgrade the utility of such assets, while simultaneously taking steps to ensure that an adversary cannot deny China access to its own information systems.58 The inescapable conclusion is that Chinese strategic force modernization, space denial and anti-access capabilities, and cyber warfare activities provide clear evidence of a strategy aimed at degrading the ability of the United States to project power and support its allies in the region and thus undermining the credibility of the U.S. extended deterrent. To address these challenges, the United States must ensure that it remains the preeminent space power.

China is challenging the US--- BMD, space

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China, meanwhile, is expanding both its ballistic missile capabilities and its space presence. China has benefited considerably from U.S. technology, including missiles, and now has an inventor}' of ICBMs capable of striking the United States. China is improving this capability by replacing its existing arsenal of CSS-4 "Mod 1" ICBMs with the longer-range CSS-4 "Mod 2," together with the development of mobile and submarine-launched variants of the Dong-feng(DF)-3i ICBM. Estimates suggest that China's arsenal could grow to as many as 60 ICBMs by the end of the decade. China seems determined to build a nuclear force designed to inhibit US. action in the event of a renewed crisis such as in the Taiwan Strait. At the same time, China has deployed several hundred short-range ballistic missiles opposite Taiwan, with roughly 100 such missiles expected to be added each year.97 These missiles could also be used to conduct strikes against Okinawa and Japan, including U.S. forces stationed there. China also possesses an active space program designed to make it a military space power. With the launch in October 2003 of its first manned spacecraft, China became the third nation, after the United States and Russia, to send a manned vehicle into space. A second successful manned mission was completed in October 2005. China's space program is designed to demonstrate Beijing's achievements and potential in such areas as computers, space materials, manufacturing technology, and electronics - technologies with dual-use military and civilian space applications - as well as to challenge U.S. dominance in space. On January 11,2007, as noted elsewhere in this report, China launched a missile that destroyed an aging Chinese satellite, thus demonstrating an ASAT capability.

## AT: US-China Coop Now

Space is the only exception

Dolman 10- Everett Dolman, PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies, September 2010, “The Case for Weapons in Space: A Geopolitical Assessment” APSA Annual Meeting, pg 2-3

On the surface, it may seem as though geopolitical forces are currently in dynamic balance. The US is the overwhelming sea and air power, offensively oriented and favoring maneuver and precision strike for advantage in war. The PRC is potentially the greatest land power the world has ever known, defensively established and reliant on masses of infantry as its core strength. Neither has a globally significant advantage vis-a-vis the other. There is no plausible near-term scenario in which the US could invade and sustain an occupation of the Chinese mainland. Likewise, the US is currently impervious to any invasion and occupation by Chinese forces. Neither state's sovereignty appears in doubt due to actions by the other. At the level of grand strategy neither mass or maneuver, offense or defense, has a transformational advantage. From this perspective, war, inevitable though it may be, is not imminent. Less venerable theories of conflict and cooperation are more favorable toward long-term peace. Economically, the US and PRC are tightly bound. Chinese markets are opening and the productivity of PRC manufacturing has allowed the US to move into a post-industrial economy. Trade is increasing substantially, and much of America's foreign debt is held by China, to the point that it is not to either state's fiscal advantage to engage in a conflict that will sever or (even just weaken) these ties. Culturally and historically, the Chinese and American people are inclined toward mutual admiration and respect. Despite the political differences between Chinese Communism and Western Liberal Democratic Capitalism, human connections and government rapprochement are valued by both sides. An appreciation of American technological innovation and Chinese work and spiritual ethics imbues the still-developing relationship. Both sides seem willing to work together and sustain a world system in which each nation-state has its place and its independence. In every sphere but one, it seems, the two great powers are building toward peace. In every sphere of competition, with one exception, there is room for negotiation and mutually beneficial outcomes. **That one incompatible, uncompromising realm is outer space.**

## Space Challengers: Russia

Russia is challenging the US- tech, BMD, sphere of influence

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

The United States faces a global security setting characterized by accelerating proliferation of weapons of mass destruction and the means to deliver them. New actors are acquiring technologies ranging from individual components to complete systems resulting in such capabilities. Although Russia does not today pose a missile threat to the United States, despite its continuing possession of large numbers of delivery systems with sufficient range to reach American targets, it possesses technologies, including ballistic missile components and expertise that are being actively proliferated. Furthermore, we have no assurance that a future Russian leadership will not threaten the United States with its extensive nuclear-armed missile inventory. Indeed, **Russia appears increasingly committed to the reestablishment of a neo-imperialist sphere of influence** in the new states to its south and west. Putin has spoken of rebuilding a "Great Russia" and has decried the dissolution of the Soviet Union as one of the greatest calamities of the twentieth century. Russia has also demonstrated a sustained and alarming drift toward authoritarianism and toward the reassertion of power on its periphery, as in the conflict with neighboring Georgia in 2008. A U.S. missile defense must therefore be sufficient to counter a future threat from Russia.

## Space Challengers: Noko/ Terrorists

North Korea and Terrorists challenging US—arms exports, short range BMD

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

At the same time, the United States faces threats from other states that are either the exporters of WMD technologies or the breeding grounds and training sites for terrorists. One such nation is North Korea, which launched a ballistic missile over Japan in 1998. In addition to missiles, North Korea now is able to export fissile material or even assembled nuclear devices, posing an additional and unacceptable threat to the United States. A nuclear-armed North Korea would also weaken deterrence in and around the Korean peninsula. Moreover, many states, as well as terrorist groups, could launch short-range missiles from ships off American coasts. We currently have no missile defense capable of destroying such missiles. The devastation caused by short-range missiles such as Scuds armed with a nuclear warhead would be far greater than the 9/11 attacks. A comprehensive approach to homeland security, in which missile defense and efforts to identify, destroy, or change such regimes are priorities, is therefore needed.

## Space Challengers: List

India, Japan, Russia, EU challenging US space heg

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

The importance of space to US. national security and economic well-being was underscored again in the Bush administration's 2006 US. National Space Policy. The policy laid out specific goals, among them the continued ability of the United States to operate unhindered in space; the strengthening of US. space leadership; and the fostering of "a robust science and technological base supporting national security, homeland security, and civil space activities."8 The new space policy also acknowledged that "freedom of action in space is as important to the United States as air power and sea power" and that "the United States considers space capabilities - including the ground and space segments and supporting links - vital to its national interests."9 The Rumsfeld Space Commission report and the national space policy are the latest manifestation of long-held views on national security space policy. Since the dawn of the space age, every US. president has embraced the belief that the United States is within its rights and obligations to protect and defend its national interests in outer space. Such actions do not preclude others from peaceful use of space for their own interests. The often muddled debate over the military uses of space frequently overlooks or intentionally ignores this crucial caveat. Although the United States remains at the forefront of space technology and exploration, America's continued preeminence is not assured. Other states are engaged in programs intended to enable them to become twenty-first century space powers capable of challenging the United States. At least 35 countries have space research programs designed to augment existing space capabilities or lead to their first deployments in space. For example: • India announced in June 2008 that it will boost its defense presence in space by developing a military space program to complement its already robust civilian space program.10 In October 2008, India launched its first lunar mission." • Japan has launched four surveillance satellites and plans to launch two more in 2009. Japan also operates a satellite known as the Advanced Land Observing Satellite (ALOS), which is believed to provide positioning data to the Japanese military. Japan's parliament also passed a new space law in May 2008 that allows for non-offensive use of space to support national security. • Russia has used its Soyuz rockets for commercial space launches since 1999.'3 • The European Union is building a 30-satellite navigation network, called Galileo, that - with the possible participation of China and other countries - has the potential to far exceed the precision of the U.S. global positioning system.'3 Galileo is scheduled for completion by 2013.1\*

## WMD Challengers: Saudi Arabia

Saudi Arabia could be moving towards a nuclear weapons program

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Saudi Arabia, which will undoubtedly find a nuclear weapons program a more attractive option if Iran achieves nuclear status and may already be pursuing a nuclear hedging strategy. Under an agreement signed during the October 2003 visit to Islamabad by Saudi Crown Prince Abdullah, Riyadh reportedly gained access to Pakistani nuclear technologies in exchange for stepped-up energy cooperation and improved strategic relations with Pak- istan.43 While Saudi Arabia has denied that it is devel- oping a nuclear weapons capability, it has been granted “small quantities protocol” status from the IAEA, which removes strict oversight of its nuclear reactor and could potentially facilitate the clandestine pursuit of nuclear weapons.44 Riyadh, meanwhile, was reported to be seek- ing modern replacements from China for its aging arse- nal of CSS-2 missiles originally purchased from China more than a generation ago.

## WMD Challengers: Egypt

**Egypt is very interested in WMD and ballistic missile tech and has been receiving it**

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Egypt, which is engaged in a clandestine effort to acquire WMD and ballistic missile technologies. Egypt has been a primary destination for North Korea’s ballistic missile exports and has received shipments of Scud B and C mis-siles, as well as No Dong missiles.40 Inspections by the IAEA have uncovered plutonium traces at Egyptian nu- clear facilities, increasing international concern about clandestine nuclear development efforts on the part of the Mubarak regime.41 The IAEA has also criticized Cairo for failing to declare certain nuclear materials and sites, one of which was a facility for separating plutonium that could be used in an atomic weapon.42

## WMD Challengers: Syria

Syria showing interest in pursuing weapon capabilities

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Syria, which maintains biological and chemical weapons capabilities and possesses a large inventory of surface- to-surface ballistic missile systems, could deliver con- ventional and unconventional warheads to neighboring countries in the Middle East.35 Syria has also shown more than a passing interest in acquiring a nuclear weapons capability, as evidenced by the construction the Al-Kibar reactor site, which was subsequently destroyed by an Is- raeli Air Force strike in September 2007. The Central In- telligence Agency (CIA) has estimated that Damascus possesses hundreds of free-rocket-over-ground (FROG) missiles, Scud missiles, and SS-21 short-range ballistic missiles (SRBMs).36 Syria also maintains the indigenous capability to manufacture liquid-fuel Scuds.37 In Septem- ber 2003 testimony before the House of Representatives Subcommittee on the Middle East and South Asia, then- Under Secretary of State John Bolton outlined that Syria “is fully committed to expanding and improving its CW [chemical weapons] program” and “is continuing to de- velop an offensive biological weapons capability.”38 Syr- ia’s mobile missile force is capable of targeting much of Israel, as well as parts of Iraq, Jordan, and Turkey, and it has “developed a longer-range missile – the Scud-D – with assistance from North Korea” while simultane- ously pursuing “both solid- and liquid-propellant mis- sile programs.”39

## WMD Challengers: Pak

Pakistan poses a threat- Developing missiles and allegiances to Al Qaeda

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Pakistan, which has had a nuclear capability at least since 1998 and has extensive ballistic and cruise missile pro- grams. Pakistan possessed as many as 100 nuclear war- heads and continues to upgrade its missile forces. The country has made major advances in missile technology, especially considering that it presently lacks the domestic science and technology base for developing such weap- ons, which suggests that it has been very successful in acquiring technologies from abroad. At the moment, Pak- istan’s longest-range ballistic missile is the Hatf-6, which has a range of 2,000 kilometers. At that range, the Hatf-6 is nearing the 2,500 kilometer threshold which the Rums- feld Commission indicated would mark the existence of the technical base necessary for the development of long- range missile systems.

While Pakistan’s nuclear arsenal and ballistic missiles are ostensibly intended to deter Indian aggression, Pakistan’s domestic political situation is so turbulent that there is no guarantee that these weapons will be used strictly for that purpose. For example, under a radicalized regime such missiles could be used against U.S. forces and mili- tary installations in Afghanistan and Iraq. Despite Paki- stan’s cooperation in the War on Terror, serious questions exist as to whether elements in the Pakistani security services, in particular the Directorate for Inter-Services Intelligence (ISI), are actively working against U.S. inter- ests by supporting Afghan and Pakistani Taliban fighters in the Pakistani tribal areas. The fact that such powerful elements could be operating outside official Pakistani policy channels is frightening, even though ISI does not directly supervise the nuclear arsenal. Pakistan’s nuclear forces are overseen by the National Command Author-ity (NCA), and underwent a thorough security upgrade in 2003. Nevertheless, concerns remain about the com- mand and control of Pakistan’s nuclear forces. Particu- larly troubling is the level of sympathy for al-Qaeda and the Taliban within the junior and mid-level cadres of the Pakistani military as a result of fighting side-by-side with Islamists against Indian forces in Jammu and Kashmir. It is precisely these officers who are most likely to be pro- moted to sensitive positions in the years ahead.

## WMD Challengers: Noko/Iran

Iranian and North Korean missile threats are rising --- blackmail and coercion will constrain US power projection

Peter Huessy 9, Senior Defense Consultant Associate at the National Defense University Foundation (NDUF) and President of GeoStrategic Analysis, “Missile Defense in the Age of Nuclear Proliferation”, inFocus, http://www.jewishpolicycenter.org/1527/missile-defense-nuclear-proliferation

The Iranians are developing missiles with ranges in excess of 2,400 kilometers, and are seeking to develop an intercontinental missile capability, which the United States Air Force predicts will be completed by 2015. Tehran also has successfully tested a two-stage rocket that placed a satellite in orbit. This is a common precursor to developing an ICBM (intercontinental ballistic missile) capability. North Korea now lags behind Iran in domestic rocket capabilities. Its last test of a long-range rocket only successfully completed two stages. If the third stage were to work, Pyongyang could land a 300 to 500 kilogram warhead on the United States. And while the West might experience relief over these apparent failures, it should be noted that Iranian technicians have been identified at North Korean launch facilities, marking a strong symbiotic relationship and the potential for technical cooperation. The Russians and Chinese also assist both rocket programs. In the case of Iran, current assessments indicate that the Mullahs are developing nuclear devices to fit onto its 2,000 to 2,400 kilometer range Shahab missiles. This is a development of the utmost significance. The Islamic Republic could fit a small nuclear device onto a short or medium range missile, and launch it from a freighter just 300 kilometers off the coast of North Carolina, for example. Indeed, as Investors Business Daily reports, "the Iranians have tested a sophisticated nuclear warhead design that lets them pack a nuclear warhead into a smaller package able to fit nicely on the Shahab-3 and other Iranian missiles." Analysts are also concerned about the threat of an electro-magnetic pulse (EMP) attack. Such an attack would involve detonating a nuclear device 20 to 70 miles above a major metropolitan area. The blast would destroy every computer and electronic device within sight of the blast. This would destroy refrigerators, cars, phones, and more. It would, in effect, set the city back more than one hundred years, technologically speaking, and effectively destroy its economy. The ripple effect of just one EMP attack, both through economic and technological mayhem, could cripple the rest of the country. The conventional wisdom is that Iran does not have the technology to launch an EMP attack on the U.S. However, the EMP Commission, chartered by Congress earlier this decade, judged that such an attack was very possible. Indeed, Iran tested a Scud-type missile off of a barge in the Caspian Sea in the mid 1990s. The Missile Defense Agency (MDA) also conducted a test off the coast of Hawaii in recent years to prove to a skeptical intelligence community that it could be done. Even as far back as 1998, the Commission on Ballistic Missile Threats to the United States concluded that an EMP type attack ranked among the more likely missile threats to the United States. While the U.S. currently has the technological capability to protect our costal regions from shorter-range attacks, such as from a freighter, to do so would require many more platforms. Systems such as the Aegis, the THAAD, and Patriot have proven to be effective in this capacity. But our current inventory needs to be expanded, as sufficient deployments around the country would deprive other regions from protection. Enhancement of the long-range interceptors deployed in Alaska and California must also be part of any defense package that seeks to deal with this threat, since an EMP threat can come from Scuds or ICBMs. As such, the U.S. Congress and the Administration should accelerate the acquisition and deployment of additional missile defense systems, as part of a global and layered capability to protect the U.S. and its allies. In the absence of such defenses, North Korea and Iran or even Russia and China, will find it easier to blackmail, coerce, or bully the U.S. or its allies. U.S. military power is not the reason we are being threatened by the likes of Pyongyang and Tehran. It is that their terrorist and hegemonic goals can only succeed if American power is overcome. As Jeffrey Kuhner, President of the Edmund Burke Institute, wrote in The Washington Times: Moscow and Peking have not abandoned their rivalry with the West… they are part of an alliance that aims to curtail and undermine American power. They have provided… support to Stalinist North Korea… They have sold vital missile and nuclear technology to Iran's apocalyptic mullahs. The are constantly obstructing the global war against terror." It is remarkable that after nearly half a century, even as the threats have gathered, critics of missile defense continue to oppose its deployment. They are wedded to the ambiguous strategy of "engagement and negotiations" with our enemies, primarily because they view U.S. policies as the root of the problem—most prominently represented by our liberation of Afghanistan and Iraq. In their view, if the United States is coerced into "staying at home," all the better. The consequences of such a policy are grave. With no missile defenses for the U.S. homeland, we can be blackmailed successfully in any confrontation with a state that has long-range missiles in its possession. For example, we might be powerless to confront North Korea if it chose to resort to aggression against South Korea. How should the U.S. prepare for this scenario? Taking no precautions will almost certainly embolden an aggressive actor like North Korea. But, a preemptive attack is also fraught with danger. Such an attack could leave Los Angeles and Pyongyang in ashes. The answer lies in the deployment of effective missile defenses in any theater. Effective missile defenses give the President and the Pentagon the ability to strike launch sites in North Korea, for example, without necessarily sparking a wider conflict. More to the point, such defenses could also intercept North Korean

## WMD Challengers: North Korea

North Korea developing nuke weapons/risks proliferating

Panda 5-19-11 – Ranjaram Panda, Senior Fellow at the Institute for Defence Studies and Analyses, New Delhi, “North Korea and Iran Partner in Ballistic Missiles Trade,” IDSA Comment, http://www.idsa.in/idsacomments/NorthKoreaandIranPartnerinBallisticMissilesTrade\_RajaramPanda\_190511

Despite China’s support to the North, it seems clear that the potential for Pyongyang to provide weapon-usable nuclear substances or atomic equipment to foreign nations continues to be a worry and poses “new challenges to international non-proliferation efforts”. Besides the US, Israel and other nations have also accused North Korea of illicitly aiding Syria in building an atomic reactor that was demolished in a 2007 Israeli air strike. The International Atomic Energy Agency is probing this matter. There is enough evidence to suggest that Pyongyang’s uranium enrichment programme is “primarily for military purposes”. If peace is to prevail in East Asia, Pyongyang must abandon its uranium enrichment programme and all aspects of its nuclear programme should be placed under international monitoring. How to check Pyongyang from being a proliferator remains a huge challenge for the international community.

North Korea making missile gains

Panda 5-19-11 – Ranjaram Panda, Senior Fellow at the Institute for Defence Studies and Analyses, New Delhi, “North Korea and Iran Partner in Ballistic Missiles Trade,” IDSA Comment, http://www.idsa.in/idsacomments/NorthKoreaandIranPartnerinBallisticMissilesTrade\_RajaramPanda\_190511

North Korea’s activities over the past year suggest that it has made substantial progress in its nuclear-weapons programme, including the establishment of a new uranium enrichment plant and work on a light-water reactor. At the same time, as the report mentions, North Korea has “continued to defy the bans on imports and exports of nuclear-related items, of conventional arms and of luxury goods.” The UNSC sanctions have been ineffective in preventing North Korea’s nuclear development and weapons sales, though “they have made it more difficult and expensive for the country to pursue these.”

There are many gaps and weaknesses in international transportation and cargo regimes and Pyongyang has taken advantage of these shortcomings to transport its weapons to customers. Indeed, Pyongyang has specialised in setting up fraudulent firms and offshore banking operations, and has been employing people with fake names to cloak the identities of blacklisted firms and officials to undertake its illegal operations. For example, the expert panel report found that the sanctioned Korea Mining Development Trading Corp. has four fake names identified by the UN sanctions committee as well as 12 other identities that were not designated.

In November 2010, North Korea allowed the US nuclear weapons expert, Siegfried Hecker, to view the approximately 2,000 uranium enrichment centrifuges at its previously secret facility. Hecker and many other specialists assert that “it is highly likely” that there are other uranium enrichment-related plants in North Korea that have not been revealed. In May 2011, the US special envoy to North Korea, Stephen Bosworth, was dispatched to Seoul for talks with the South Korean officials on North Korea’s requests for food assistance as well as respite from the current nuclear impasse. Though Bosworth did not comment on the expert panel report, he condemned North Korea’s uranium programme.

North Korea missile threat must be addressed

Bolton 7-14-11 – John R. Bolton, a former U.S. ambassador to the United Nations, is a senior fellow at the American Enterprise Institute, “North Korea edges toward next nuke test,” http://www.washingtontimes.com/news/2011/jul/14/north-korea-edges-toward-next-nuke-test/

A real strategy, which we need much sooner than later, would require understanding that the DPRK and Iranian threats, including cyberwarfare, are two sides of the same coin, not unrelated outbreaks of nuclear contagion. The United States must take both seriously, reversing our present course of ignoring both.

Waiting passively for a third DPRK nuclear test is unacceptable, although that might be the only event to motivate Mr. Obama to pay at least lip service to combating Pyongyang’s continuing threat. By removing the public spotlight from the North - and its customers and suppliers - his administration has made it easier to evade existing sanctions and harder to impose new constraints absent another attention-riveting underground test. Moreover, Seoul is keenly aware of the North’s impending succession crisis and is likely prepared to take a much tougher line than in recent years.

At a minimum, therefore, we must press China and Russia far harder to quarantine North Korea’s trafficking in nuclear and missile technologies and materials. Unfortunately, the administration’s startling passivity means missing opportunities, which we will all regret very soon.

Yes North Korean missile development- UN report

Panda 5-19-11 – Ranjaram Panda, Senior Fellow at the Institute for Defence Studies and Analyses, New Delhi, “North Korea and Iran Partner in Ballistic Missiles Trade,” IDSA Comment, http://www.idsa.in/idsacomments/NorthKoreaandIranPartnerinBallisticMissilesTrade\_RajaramPanda\_190511

North Korea and Iran have been allegedly involved in ballistic missiles trade for a while. An 81-page report by the UN panel of experts, submitted to the Security Council on May 13, 2011, has established that North Korea has persisted in attempting to export ballistic missiles, missile components and relevant technologies to Iran. The report also suggests that North Korea has finished or nearly finished a second launch complex for long-range missiles along its west coast. It may be recalled that North Korea began a ballistic missile programme in the 1970s and test-launched its first ballistic missile in the 1990s. It transpires now that the Dongchang-ri complex’s facilities may be “bigger and more sophisticated” than the first missile launch installation at Musudan-ri.

North Korea gaining missile capabilities in the status quo, your authors don’t assume this because Obama has been silent

Bolton 7-14-11 – John R. Bolton, a former U.S. ambassador to the United Nations, is a senior fellow at the American Enterprise Institute, “North Korea edges toward next nuke test,” http://www.washingtontimes.com/news/2011/jul/14/north-korea-edges-toward-next-nuke-test/

You wouldn’t know it from the Obama administration, but North Korea’s global threat continues to metastasize. South Korea recently concluded that extensive cyber-attacks against civilian and military targets in the South emanated from the Democratic People’s Republic of Korea (DPRK). Following China’s lead in information warfare, the North is creating yet another asymmetric military capability it can deploy against its adversaries and also peddle for hard currency to other rogue states and terrorists.

Although Pyongyang limited its targeting of this particular sortie to South Korea, the potential cyberwarfare battlefield is global and includes the United States, which already is the subject of extensive cyberprobing, exploitation and espionage by China. For a country perennially on the brink of starvation, North Korea’s military foray into cyberspace demonstrates its continuing malevolence.

The DPRK’s nuclear-weapons program has not rested on its laurels, either, with widely observed surface-level preparations for a possible third underground test well under way.

The North’s development of ballistic missiles capable of delivering nuclear payloads is also advancing apace, as Russian missile designer Yuri Solomonov highlighted last month in a Kommersant interview. This is hardly surprisingly given Iran’s increasing long-range capabilities, the extensive Tehran-Pyongyang collaboration, and their programs’ common base in Soviet-era Scud missile technology.

Meanwhile, Pakistan’s A.Q. Khan has released documents purportedly showing prior North Korean bribery of senior Islamabad officials to grease the transfer of nuclear or ballistic-missile technology. While their authenticity is disputed, the documents are part of Mr. Khan’s continuing campaign to prove he did not act solo in the world’s illicit nuclear-weapons bazaar.

He long ago admitted supplying North Korea and Iran with critical nuclear technology. Pyongyang’s unveiling in November of impressive new uranium-enrichment facilities at Yongbyon and recent construction there show the continuing fruits of Mr. Khan’s entrepreneurship. His documents - and the many others he undoubtedly has in a shoebox somewhere - are worth verifying and actually might help Islamabad and Washington work together to repair their fractured relationship and prevent China from exploiting their current differences.

Clearly, North Korea’s weapons programs are not decelerating even amid intensive preparations for a possible transition of power, following Kim Jong-il’s death, to a third member of the communist Kim dynasty. But faced with these challenges, the Obama administration has been not only publicly silent but essentially passive both diplomatically and intellectually. Only the Pentagon and the intelligence community, fortunately still implementing the Proliferation Security Initiative, have done much beyond noting pro forma that the troublemaking DPRK is still at it.

## WMD Challengers: Iran

Iran gaining missiles/potentially working with North Korea

Panda 5-19-11 – Ranjaram Panda, Senior Fellow at the Institute for Defence Studies and Analyses, New Delhi, “North Korea and Iran Partner in Ballistic Missiles Trade,” IDSA Comment, http://www.idsa.in/idsacomments/NorthKoreaandIranPartnerinBallisticMissilesTrade\_RajaramPanda\_190511

Meanwhile, the response from Iran, as expected, was of denial. It rejected charges of missile cooperation with North Korea. Slamming the expert panel’s findings as “fabrications”, Iran’s Foreign Ministry spokesman Ramin Mehmanparast argued that Iran’s own missile capabilities are so advanced that it does not need outside help. He said: “Iran’s (missile) technology and capability are advanced enough that we don’t need other countries to provide us technology or components. …We have repeatedly rejected reports on the exchange of ballistic missile technology or parts with any country.” However, an independent assessment made by the US intelligence analysts suggests that Russia has also supported entities in China and North Korea to help Iran move towards self-sufficiency in the production of ballistic missiles. Indeed, Tehran’s collaboration with Pyongyang on missile development was evident during an October 2010 North Korean military parade which showcased a new Nodong missile warhead. The warhead possessed “a strong design similarity with the Iranian Shahab 3 triconic warhead.”

Iran’s missile program is a threat- recent developments

**DAREINI 6-2-11** – Ali Akbar Dareini, Associate Press for Yahoo Games, “Iran: Missile progress shows sanctions futile,” http://news.yahoo.com/iran-missile-progress-shows-sanctions-futile-162422024.html

Iran's defense minister claimed Saturday that the country's missile progress shows that U.N. sanctions are ineffective and won't stop Tehran's defense programs.

The statement by Gen. Ahmad Vahidi comes during 10 days of war games in Iran's latest show of military might and displays what Tehran claims is growing self-sufficiency in military and other technologies.

Vahidi said Iran's missile program is "indigenous" and has no reliance on foreign countries to meet its defense requirements. Iran is under four sets of U.N. sanctions over its refusal to halt uranium enrichment, a technology that can be used to produce nuclear fuel or atomic weapons.

Last week, Iran unveiled underground missile silos for the first time, making Iran's arsenal less vulnerable to any possible attack.

Iran's Revolutionary Guard, the country's most powerful military force, said the Islamic Republic has the ability to produce missiles with a greater range than those currently in its arsenal, but doesn't need to do so.

The upgraded version of Iran's Shahab-3 and Sajjil-2 missiles already can travel up to 1,240 miles (2,000 kilometers) — putting Israel, U.S. bases in the Gulf region and parts Europe within reach.

"The war games ... show Iran's great capability in designing, producing and using various kinds of missiles based on domestic knowledge. This showed that the sanctions imposed had no effect on Iran's missile program," Vahidi said in comments posted on sepahnews.com, the Guard's official website.

Iran has periodically boasted of what it calls homegrown advances in technological sectors such as its satellite program and other scientific work.

North Korea and Iran are trading BMT

BBC 5-14-11 – BBC News, “North Korea and Iran sharing ballistic missile technology,” Asia-Pacific, http://www.bbc.co.uk/news/world-asia-pacific-13402590

North Korea and Iran appear to have been exchanging ballistic missile technology in violation of sanctions, a leaked UN report shows. The report, obtained by Reuters, said regular transfers had been taking place through "a neighbouring third country", named by diplomats as China.

The sanctions were imposed on Pyongyang by the UN after it conducted a series of nuclear tests in 2006 and 2009. They ban all trade in nuclear and missile technology with North Korea.

They also imposed an arms embargo and subjected some North Korean individuals to travel bans and assets freezes. North Korea has twice tested nuclear devices and said in September last year that it had entered the final phase of uranium enrichment.

The country is believed to have enough plutonium to make about six bombs, but is not thought to have developed a ballistic missile capable of carrying a nuclear warhead.

The report was written by a UN panel of experts monitoring Pyongyang's compliance with the sanctions. It said that "prohibited ballistic missile-related items are suspected to have been transferred between the Democratic People's Republic of Korea [North Korea] and the Islamic Republic of Iran", using regular scheduled flights on national carriers Air Koryo and Iran Air.

For arms and related material, "whose illicit nature would become apparent on any cursory physical inspection", Pyongyang appeared to prefer the use of chartered cargo flights, Reuters quoted it as saying. The flights would travel "from or to air cargo hubs which lack the kind of monitoring and security to which passenger terminals and flights are now subject".

This presented "new challenges to international non-proliferation efforts", said the panel.

Iran secretly tested ballistic missiles

Phillips 6-30-11 – James Phillips, Senior Research Fellow for Middle Eastern Affairs at the Douglas and Sarah Allison Center for Foreign Policy Studies at The Heritage Foundation, “Iran’s Missile Tests Amplify Nuclear Alarm Bells,” The Foundry

Iran secretly has tested ballistic missiles that are capable of carrying a nuclear warhead in violation of U.N. Security Council resolutions, British Foreign Secretary William Hague warned yesterday. Britain believes Iran conducted at least three secret tests of medium-range missiles since October, more evidence of Iran’s accelerating missile buildup. Hague’s statement came the day after Iran’s Islamic Revolutionary Guard Corps claimed to have launched 14 missiles as part of the ongoing “Great Prophet 6,” 10 days of military exercises designed to showcase the Islamic Republic’s growing military strength.

Hague also expressed alarm at Iran’s plans to triple its capacity to enrich uranium to 20 percent, a higher level than is needed for civilian nuclear power. Tehran claims that it needs such highly enriched uranium to fuel its research reactor, but has no known means of transforming such uranium into fuel rods suitable for fueling the reactor. It is particularly suspicious that these uranium enrichment operations will take place inside a fortified mountain base near Qum—discovered by Western intelligence agencies in 2009 after it was covertly built without informing the International Atomic Energy Agency, a violation of Iran’s nuclear proliferation commitments. By enriching uranium to 20 percent, Iran will position itself for a much faster nuclear breakout, as it is much easier to enrich to the 90 percent level needed for nuclear weapons from uranium already enriched to 20 percent than from the 3 percent level used in most civilian nuclear reactors.

Obama continues to downplay Iran’s missile capabilities despite recent advancements

Phillips 6-30-11 – James Phillips, Senior Research Fellow for Middle Eastern Affairs at the Douglas and Sarah Allison Center for Foreign Policy Studies at The Heritage Foundation, “Iran’s Missile Tests Amplify Nuclear Alarm Bells,” The Foundry

Iran also unveiled several new missile silos on Monday, and yesterday it claimed to have built a new long-range radar system capable of monitoring low-flying satellites. If true, such a radar system might enable the Revolutionary Guards to better conceal their nuclear and ballistic missile activities from Western intelligence satellites by giving them advance notice of when such satellites were due to pass over sensitive areas.

One of Iran’s most potentially dangerous new missiles is the Khalije Fars (“Persian Gulf”) anti-ship missile, which reportedly is a solid-fuel missile capable of hitting ships up to 350 kilometers away. Combined with airborne surveillance aircraft that could provide targeting data, this missile could pose a threat to U.S. aircraft carriers and other warships. One of the foremost experts on Iran’s ballistic missile arsenal, Uzi Rubin, considers that such a missile capability could be “a game-changer” in the event of hostilities in the Persian Gulf between Iran and the United States.

Meanwhile, the Obama Administration continues to downplay Iran’s progress on the ballistic missile and nuclear fronts. It maintains that international sanctions have slowed the momentum of Iran’s military buildup, despite mounting contradictory evidence.

## Deterrence Uniq: Threats High

Status quo threats harder to respond to than previous threats

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Misile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Twenty-first century threats to the United States, its de- ployed forces, and its friends and allies differ fundamental- ly from those of the Cold War. An unprecedented number of international actors have now acquired – or are seeking to acquire – missiles. These include not only states, but also non-state groups interested in obtaining missiles with nucle- ar or other payloads. The spectrum encompasses the missile arsenals already in the hands of Russia and China, as well as the emerging arsenals of a number of hostile states.

The character of this threat has also changed. Unlike the Soviet Union, these newer missile possessors do not attempt to match U.S. systems, either in quality or in quantity. In- stead, their missiles are designed to inflict major devasta- tion without necessarily possessing the accuracy associated with the U.S. and Soviet nuclear arsenals of the Cold War.1

The warning time that the United States might have be- fore the deployment of such capabilities by a hostile state, or even a terrorist actor, is eroding as a result of several fac- tors, including the continued proliferation and widespread availability of technologies to build missiles and the result- ing possibility that an entire system might be purchased out- right. Would-be possessors do not have to engage in the pro- tracted process of designing and building a missile. They could purchase and assemble components, reverse-engineer a missile after having purchased a prototype, or immediately acquire a number of assembled missiles. Even missiles that are primitive by U.S. standards might suffice for a rogue state or terrorist organization seeking to inflict extensive damage upon the United States. As the Rumsfeld Commission point- ed out in its 1998 report:

Under some plausible scenarios – including re-bas- ing or transfer of operational missiles, sea- and air- launch options, and shortened development pro- grams that might include testing in a third country – or some combination of these – the United States might well have little or no warning before opera- tional deployment.2

**Threat of missiles by other nations is greater than econ crisis and is real**

**Kennedy 08** – Brian T. Kennedy, president of the Claremont institute, November 24, 2008, “What a Single Nuclear Warhead Could Do, Why the U.S. needs a space-based missile defense against an EMP attack,” The Wall Street Journal

As severe as the global financial crisis now is, it does not pose an existential threat to the U.S. Through fits and starts we will sort out the best way to revive the country's economic engine. Mistakes can be tolerated, however painful. The same may not be true with matters of national security.

Although President George W. Bush has accomplished more in the way of missile defense than his predecessors -- including Ronald Reagan -- he will leave office with only a rudimentary system designed to stop a handful of North Korean missiles launched at our West Coast. Barack Obama will become commander in chief of a country essentially undefended against Russian, Chinese, Iranian or ship-launched terrorist missiles. This is not acceptable.

The attacks of Sept. 11, 2001, have proven how vulnerable we are. On that day, Islamic terrorists flew planes into our buildings. It is not unreasonable to believe that if they obtain nuclear weapons, they might use them to destroy us. And yet too many policy makers have rejected three basic facts about our position in the world today:

First, as the defender of the Free World, the U.S. will be the target of destruction or, more likely, strategic marginalization by Russia, China and the radical Islamic world.

Second, this marginalization and threat of destruction is possible because the U.S. is not so powerful that it can dictate military and political affairs to the world whenever it wants. The U.S. has the nuclear capability to vanquish any foe, but is not likely to use it except as a last resort.

Third, America will remain in a condition of strategic vulnerability as long as it fails to build defenses against the most powerful political and military weapons arrayed against us: ballistic missiles with nuclear warheads. Such missiles can be used to destroy our country, blackmail or paralyze us.

Yes threat from BM

Lambakis 7 – Steven Lambakis, pHd, national security and international affairs analyst specializing in space power and policy studies for National Institute for Public policy, March 2007, “Leveraging Space to Improve Missile Defense” High Frontier, The Journal for Space & Missile professionals, Volume 3, Number 2

The adversaries of the US are looking hard at ballistic missiles because they represent a challenging threat. An intercontinental ballistic missile (ICBM) can travel at extremely high speeds—at times more than 15,000 mph. Kinetic energy interceptors collide with targets in space thousands of miles away at closing speeds that can exceed 25,000 mph. Besides hurling very small objects through air and space at very high speeds, ballistic missiles can be launched from anywhere at any time from multiple directions, to anywhere on the globe. Adding to this challenge, we can ex- pect adversaries to employ countermeasures to foil missile de- fense calculations and disrupt system operations.

With intercontinental flight times measured in minutes, ballis- tic missiles are the surest and fastest way to destroy a distant city or military asset. They can give a state regional or even global prestige and are a potentially significant military weapon and tool of terror, especially if those missiles are married to weapons of mass destruction. Longer-range systems would give hostile rogue states a capability to vault over the oceans to strike Ameri- can cities and blackmail US leaders.

In the future, we may face adversaries unknown to us today, fight in unexpected regions, or have to defend against new types of ballistic missiles and countermeasures. The significance of this uncertainty for missile defense planners is enormous. This means that we cannot be totally focused on “who” poses the threat today because the “who” can change with a political de- cision or by a surprise shift in capabilities from one region to another. Similarly, a focus on the “how” does not mean we can ignore today’s enemies or their present-day capabilities. On the contrary, today’s ballistic missile threats continue to drive our Nation’s near-term missile defense fielding and long-term development efforts. Today’s threats provide “ground truth,” a measure of what is possible today and, therefore, a low-end representation of what we must be prepared to defeat tomorrow. The “high end” represents ballistic missile threats that today are either unrealized or unknown but yet are possible to develop.

There has been steady interest and investment of scarce re- sources by some 20 to 30 countries in acquiring ballistic missiles and improving payload destructive power, warhead accuracy, and delivery range. Turnkey missile systems have been trans- ferred from one state to another and may one day be purchased by terrorists. So why must we pay attention? Because a missile strike involving nuclear, biological, or chemical weapons could wreak catastrophic damage, far surpassing the levels of destruc- tion, economic dislocation, and terror produced by the 11 Sep- tember 2001 attacks.

Yes threat from BM

Lambakis 7 – Steven Lambakis, pHd, national security and international affairs analyst specializing in space power and policy studies for National Institute for Public policy, March 2007, “Leveraging Space to Improve Missile Defense” High Frontier, The Journal for Space & Missile professionals, Volume 3, Number 2

The international web of trading relationships in ballistic mis- siles and related technologies is extensive. Short-range ballistic missile systems are plentiful and available for sale on the in- ternational black market. Equally worrisome is the heightened interest in longer-range systems. For example, North Korea is developing an improved performance intermediate-range ballis- tic missile that can travel about 3,200 km. North Korea also has an intense development program to produce an ICBM. The Taepo Dong-2 ICBM may have a two-stage variant (and travel around 10,000 km) and a three-stage variant (15,000 km). The 4 July 2006 test of the Taepo Dong-2 failed moments after lift-off, demonstrating that the North Koreans have more work to do. There is every indication, however, they will continue to strive for a viable long-range strike capability in addition to producing and selling shorter-range systems that may be used to threaten its neighbors, such as Japan.

Iran also has a significant ballistic missile development pro- gram. Besides its numerous short-range systems, Iran is devel- oping a medium-range ballistic missile (Shahab-3) based on North Korean No Dong technology. In its quest for longer reach, Iran is developing an extended range Shahab-3 (which can travel 1,300 km and threaten Israel) and a new medium-range system (which may travel 2,000 km and reach into portions of Europe). In November 2006, Iran showcased on television several ballis- tic missile launches, to include the Shahab-3, demonstrating for the world the importance Tehran places on its ballistic missile development program. Iran is believed to be working on inter- continental range ballistic missiles, which may be in its arsenal by 2015, that is if it does not import longer-range systems from proliferators like North Korea earlier than that.

Countries like China and Russia have done considerable work on ballistic missile and countermeasure technologies.4

Having developed and deployed advanced ballistic missiles of all ranges and done extensive research on nuclear weapons, we are right- fully concerned, not only about the tremendous and devastating offensive potential of these foreign ballistic missile forces, but also about the willingness of these two governments to prolifer- ate ballistic missile technologies abroad and sell their expertise to other countries.

In other words, there are significant technological and politi- cal uncertainties to weigh as we consider how to proceed with the development of US missile defenses. How China and Russia will play in the use and proliferation of ballistic missiles is no small part of this consideration. How will our adversaries fight today and tomorrow and with what capabilities? How can we technologically and operationally defend ourselves against an array of ballistic missile threats? The truth is, we cannot know for certain, so we must be ready for many contingencies.

## Weaponization Inev

Its inevitable

Jaspal 3/25/11—Fawaz Jaspal, PhD and Professor at the Department of International Relations, Quaid-I-Azam University, “Fourth medium of warfare” Islamabad Pulse, online: http://www.weeklypulse.org/details.aspx?contentID=362&storylist=2

The Great powers have been inching towards the fourth-medium of warfare—“Space Warfare”. The United States’ ambition to preserve its military primacy and the other leading powers vigilance about the credibility of their deterrent capabilities manifest that the **space weaponization is inevitable.** The strategic trends manifest that the danger of weaponization of outer space **is increasing with each passing day**. The developments, such as the demise of the 1972 ABM Treaty of in June 2002, the US massive invest in ballistic missile defense development, the Western and Asian powers endorsement of the United States ballistic missile defense program, the US promise to transfer BMD technology to its allies, the US, India and Israel veto to the Prevention of an Arms Race in Outer Space (PAROS) at the Conference on Disarmament (CD) in 2005, the unpersuasive deliberation on the core issues of the CD agenda in 2011, and above all research and development program of space weapons during the last decade give rise to the deep concern that outer space might be turned into a ‘battle field’. For three decades, the international community has been struggling to prevent an arms race in the outer space. For instance, for strengthening existing treaties for the security of space international community has made unremitting efforts since the beginning of 1980s. In 1981, the UN General Assembly passed a resolution on the “Prevention of an Arms Race in Outer Space” (PAROS). In conformity with the Outer Space Treaty, PAROS calls upon member states to actively contribute to the prevention of a space arms race with the prospect of forming an international agreement. Presently, the Conference on Disarmament is the sole multilateral disarmament negotiating forum, which has the primary role in the negotiation of a multilateral agreement or agreements, as appropriate, on the prevention of an arms race in outer space in all its aspects. From 1985 to 1994, the CD had established ad hoc committees for 10 consecutive years to discuss issues related to prevention of an arms race in outer space. Though the ad hoc ended in 1996, the debate on the PAROS treaty continues in the CD. The Russians and Chinese adopted a constructive approach towards the prevention of an arms race in the outer space. In February 2008, China and Russia submitted to the CD a draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects. The treaty bans placement of any type of weapons in outer space, but it allows for deployment of ground-, sea and air-based ASAT systems as an inherent right to self-defense embodied in Article 51 of the UN Charter. The CD adopted a program of work in May 2009. It established a Working Group entitled “Prevention of an Arms Race in Outer Space” to discuss substantively all issues related to the prevention of an arms race in outer space. The review of recent proceedings of the CD reveals that the world is not likely to get a PAROS treaty in the near future. Though in February 2008, China and Russian Federation submitted a draft Treaty on the Prevention of the Placement of Weapons in Outer Space, pessimism continues due to the United States naysayer attitude on PAROS at the CD despite President Barack Obama's pledge to seek a ban on space weapons in February 2009. Indeed, the world would have no PAROS treaty until US delegates in the CD seriously work for its draft. The Americans ambition to preserve its military primacy in global politics and deploy credible missile defenses in the near future is the driving force for the invention of lethal space weapons and their deployment in the Space. The **weaponization of space is both a natural progression from the aim of providing multi-tiered ballistic missile defenses, i.e. land, sea, air, with space as the fourth tier**, also described as the ‘fourth medium of warfare’. In August 1996, General Joseph W. Ashy, Commander-in-Chief of US Space Command (CINCSPACE), said: “We're going to fight a war in space. We're going to fight from space and we're going to fight into space...”

## Weaponization Inev: China

**Weaponization in space is inevitable—only a question if the US beats China**

Maginnis 4/5/11—Robert Maginnis, former Army lieutenant colonel, and a national security and foreign affairs analyst, “China Masking Huge Military Buildup” online: http://www.humanevents.com/article.php?id=42726

China’s anti-space weaponization view hasn’t stopped it from developing its own space weapon, however. The white paper makes no mention of China’s 2007 successful direct-ascent anti-satellite (ASAT) weapons test, which destroyed its own satellite in space. “The test raised questions about China’s capability and intention to attack U.S. satellites,” according to a Congressional Research Service (CRS) report. The Pentagon’s report states, "China continues to develop and refine this [ASAT] system, which is one component of a multidimensional program to limit or prevent the use of space-based assets by potential adversaries during times of crisis or conflict.” The report also indicates China is developing kinetic and directed-energy weapons for ASAT missions. Gen. Xu Qiliang, commander of China’s air force, appears to confirm the Pentagon’s analysis. He said in 2009 that **military competition extending to space is “inevitable”** and emphasized the transformation of China’s air force into one that “integrates air and space” with both “offensive [read ASAT] and defensive” capabilities, according to the Pentagon’s report. Third, “China firmly opposes the proliferation of weapons of mass destruction [WMD] and their means of delivery.” The paper also states “nonproliferation issues should be resolved through political and diplomatic means” and then cites as examples the nuclear crises with North Korea and Iran . Even though China is a signatory to various nonproliferation treaties, it is arguably the world’s biggest WMD supplier. A March 2011 CRS report states, “China has been a ‘key supplier’ of technology … providing nuclear and missile-related technology to Pakistan and missile-related technology to Iran .” CRS documents China’s proliferation activities beginning in 1982. It transferred sensitive material and tools for making atomic bombs to Pakistan such as uranium hexafluoride gas, ring magnets, and “high-tech diagnostic equipment." Pakistan then sold that technology to Iran, North Korea, and Libya, according to then- CIA Director George Tenet. Fourth, “China pursues a national defense policy which is defensive in nature.” The white paper also claims, “China unswervingly takes the road of peaceful development.” But China’s weapons-building spree confirms it seeks a significant offensive capacity, and its military action identifies it as a regional hegemon, not a peaceful neighbor. Three weapons platforms strongly suggest China seeks a robust offensive capacity. In January, while Secretary of Defense Robert Gates visited Beijing, the Chinese military tested a J-20 fifth-generation stealth fighter. That sophisticated platform is primarily for undetected, long-range offensive operations and shares state-of-the-art technology with the F-22 Raptor, America’s best fighter. In December, Adm. Robert Willard, the commander of U.S. Pacific Command, told the Asahi Shimbun, a Japanese newspaper, China is developing an anti-ship ballistic missile (ASBM) known as an “aircraft carrier killer.” The 1,500-mile range DF-21 ASBM is an offensive platform that uses a space-based maritime surveillance and targeting system that permits it to strike moving warships at sea. China also plans to build a fleet of aircraft carriers this decade, according to the Pentagon report. It already has the ex-Varyag—a former soviet Kuznetsovclass aircraft carrier in the Dalian shipyard—and a program to train pilots operating fixed-wing aircraft from a carrier. China is using its sophisticated blue-water navy, which numbers 260 vessels, including 75 major warships and more than 60 submarines, to expand its sphere of influence through intimidation, especially in the South China Sea, which some Chinese officials label a “core interest.” Last year, the New York Times reported Chinese officials told Deputy Secretary of State James Steinberg that China would not tolerate “foreign interference” in the South China Sea, and its actions back up that view. China’s navy aggressively seizes fishing boats near contested South China Sea islands hundreds of miles from the mainland and harasses Japanese aircraft and ships in the East China Sea near Japanese islands. That aggression is not limited to regional players, however. Starting in 2000, China became provocative toward American naval forces. In 2001, a Chinese fighter collided with a U.S. Navy aircraft, forcing the American crew to land at China’s Hainan Island. Harassment on the sea is more common. From 2001 to 2009, Chinese warships and aircraft harassed and threatened the USNS Bowditch, USNS Sumner, USNS Impeccable, and the USNS Victorious. In 2006, a Chinese Song-class submarine surfaced dangerously near the aircraft carrier USS Kitty Hawk. In each case, China violated international law. Finally, “China maintains that the global missile defense program will be detrimental to international strategic balance and stability [and] no state should deploy overseas missile defense systems [ballistic missile defense] …” **This hypocritical comment** is targeted at the U.S., which has both land- and sea-based systems. America’s sea-based Aeigis ballistic missile defense (BMD) systems often sail near North Korea’s coast, protecting our allies from China’s rogue partner. Apparently China wants to limit America’s BMD capability until it can acquire one of its own. Currently China has a limited capability against tactical ballistic missiles with ranges up to 300 miles. But the Pentagon report states **China is “proceeding with the research and development of a missile defense ‘umbrella’ consisting of kinetic energy intercept at exo-atmospheric altitudes, as well as intercepts of ballistic missiles and other aerospace vehicles within the upper atmosphere.**” China’s 2010 white paper is chock-full of misleading messages that deny transparency, promote distrust, and demonstrate the regime’s hegemonic ambitions. Unless China changes its actions, America has no choice but to conclude Beijing’s intent is to become the world’s dominant military power.

## Solvency: Deterrence

BMD checks rogue states

-kills momentum

- try to kill civilians

- win psychology of the battle

- ABL has ineffective range and is limited

- SBMD destroys morale of attacking countries, shortening conflicts

Dinerman 8- Taylor Dinerman is a Senior Editor at the Hudson Institute’s New York office, and a part time consultant for the US Defense Department, September 8, 2008, “Space-based missile defense and the psychology of warfare”, The Space Review, http://www.thespacereview.com/article/1205/1

It is exactly this need for revenge that should get the attention of those in the US government who are trying to design a realistic missile defense policy for the next fifty years. Tyrannical regimes and terrorist movements share the need to excite people with dramatic and violent events. The more spectacular the attack, the better. Firing long-range missiles at an enemy, even if you only hit an empty parking lot, can provide followers with a level of emotional satisfaction. This in turn can motivate them to continue to fight even in a seemingly hopeless battle.

In future wars, those who are fighting against the West—today Iran or North Korea, tomorrow, who knows?—will use ballistic missiles not only to terrorize enemy civilian populations but to build morale among their own forces and people. Missile defense is the key to winning this critical psychological battle. As long as their missiles are being shot out of the sky, claims that they are hurting the enemy and thus filling people’s need for revenge can be shown to be utterly empty.

This, however, cannot be done with terminal phase defense weapons. To hit a missile or a warhead that is descending towards its target may be a feat of technological skill, but it does nothing to decrease the emotional satisfaction that comes from striking a hated enemy. Midcourse interceptors such as the US GBI or the Israeli Arrow are better, but the best way to publicly humiliate those who are launching Scud-type missiles is to shoot them down as soon after they leave the launch pad as possible. The only weapon now in development that will—in theory—be able to do this is the Airborne Laser (ABL), which the Missile Defense Agency plans to test next year.

This is indeed a promising system, but it has its limits. Its range is, according to unclassified reports, about 300 kilometers, and the US only plans to build, at most, seven aircraft. If the goal is to prevent the enemy from using its missile attacks to build its own side’s morale and thus lengthen the war, another solution must be found.

Space-based interceptors, such as a new version of the Brilliant Pebbles program that was canceled in 1993, could, in combination with space- and ground-based sensors, knock down missiles of this type in the boost phase. Significantly, they would do so over the launching country’s own territory and at least some of the citizens would witness the destruction of their leader’s vengeance weapons. This news would spread through word of mouth. This might be one of the keys to undermining their will to make war and help shorten the conflict.

Robust missile defense system key to deterrence

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Misile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Given this multiplicity of ballistic missile threats, the Unit- ed States must deploy a missile defense that deters hostile states from developing or acquiring missile capabilities that could threaten the United States, its allies and coalition part- ners, and its forces deployed abroad. Furthermore, America’s missile defense R&D programs, together with planned de- ployments, must be sufficiently robust to dissuade would-be missile possessors from attempting to challenge the United States. Washington must deter future enemies from acquir- ing ballistic missiles, just as in the past it dissuaded them from developing strategic bombers because of America’s abil- ity to overwhelm such systems. Finally, U.S. missile defense must be capable of defeating those ballistic missiles, what- ever their range and type, that could be launched against the United States.

SMD Key

Lambakis 7 – Steven Lambakis, pHd, national security and international affairs analyst specializing in space power and policy studies for National Institute for Public policy, March 2007, “Leveraging Space to Improve Missile Defense” High Frontier, The Journal for Space & Missile professionals, Volume 3, Number 2

The important point here is that, all at once, a space-based layer of weapons gives the current missile defense system a true global engagement capability. Without space, the only way to deal with threat uncertainty is to populate the world with fixed and mobile sensors and radars (on ground and at sea). As you might imagine, the cost of doing so would be prohibitive, and would probably not be politically sustainable.

Without a space-based layer, missile defenses would con- tinue to require numerous bilateral and multilateral agreements with our allies and friends to host various missile defense assets. And there would continue to be a risk that these assets would not be properly positioned to defend against a particular threat. Space-based interceptors introduce flexibility and a near-global coverage capability into the system, they can offer a very cost- effective and, from one perspective, politically-efficient option for dealing with an uncertain and evolving threat.

Deterrence advantage- cost benefit analysis

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

The benefits of space-based defense are manifold. The deployment of a robust global missile defense that includes space-based interdiction capabilities will make more expen- sive, and therefore less attractive, the foreign development of offensive ballistic missile technologies needed to over- come it. Indeed, the enduring lesson of the ABM Treaty era is that the absence of defenses, rather than their presence, empowers the development of offensive technologies that can threaten American security and the lives of American citizens. And access to space, as well as space control, is key to future U.S. efforts to provide disincentives to an array of actors seeking such power.

Awesome Aff deterrence/Space key (A2: Current technology solves)

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Missile defense has entered a new era. With the initial missile defense deployments, the decades-long debate over wheth- er to protect the American people from the threat of ballis- tic missile attack was settled – and settled unequivocally in favor of missile defense. What remains an open question is how the American missile defense system will evolve in the years ahead to take maximum advantage of technological opportunities to meet present and emerging dangers.

There is ample reason for concern. The threat environ- ment confronting the United States in the twenty-first cen- tury differs fundamentally from that of the Cold War era. An unprecedented number of international actors have now acquired – or are seeking to acquire – ballistic missiles and weapons of mass destruction. Rogue states, chief among them North Korea and Iran, place a premium on the acqui- sition of nuclear, chemical, and biological weapons and the means to deliver them, and these states are moving rapid- ly toward that goal. Russia and China, traditional competi- tors of the United States, continue to expand the range and sophistication of their strategic arsenals at a time when the United States debates deep reductions in its strategic nu- clear forces beyond those already made since the end of the Cold War and has no current modernization program. With a new administration, furthermore, the future development of even our limited missile defense system is in question. Furthermore, a number of asymmetric threats – including the possibility of weapons of mass destruction (WMD) ac- quisition by terrorist groups or the devastation of American critical infrastructure as a result of electromagnetic pulse (EMP) – now pose a direct challenge to the safety and se- curity of the United States. Moreover, the number and so- phistication of these threats are evolving at a pace that no longer allows the luxury of long lead times for the develop- ment and deployment of defenses.

In order to address these increasingly complex and mul- tifaceted dangers, the United States must move well beyond the initial missile defense deployments of recent years to deploy a system capable of comprehensively protecting the American homeland as well as U.S. overseas forces and al- lies from the threat of ballistic missile attack. U.S. defenses also must be able to dissuade would-be missile possessors from costly investments in missile technologies, and to de- ter future adversaries from confronting the United States with WMD or ballistic missiles. America’s strategic objec- tive should be to make it impossible for any adversary to influence U.S. decision making in times of conflict through the use of ballistic missiles or WMD blackmail based on the threat to use such capabilities.

These priorities necessitate the deployment of a system capable of constant defense against a wide range of threats in all phases of flight: boost, midcourse, and terminal. A lay- ered system – encompassing ground-based (area and the- ater anti-missile assets) and sea-based capabilities – can provide multiple opportunities to destroy incoming missiles in various phases of flight. A truly global capability, howev- er, cannot be achieved without a missile defense architec- ture incorporating interdiction capabilities in space as one of its key operational elements. In the twenty-first centu- ry, space has replaced the seas as the ultimate frontier for commerce, technology, and national security. Space-based missile defense affords maximum opportunities for inter- ception in boost phase before rocket boosters have released warheads and decoys or penetration aids.

Good deterrence/leadership card

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

The policy benefits of a space-based missile defense layer are straightforward. A more effective missile defense system that fully leverages space would provide a true on-call global defensive capability, and this could lead to increased stability in the world. Defenses deter attacks by reducing confidence in the success of any attack. The more effective the missile defense system is, the greater will be its deterrence value, and the less likely will we be to have to use it at all.

At some point, when the system is seen by other governments as highly effective, they could recognize a diminishing marginal rate of return in their own ballistic missile investments. As more allies invest in missile defense, U.S. space-basing activities could build on current missile defense cooperative activities and open up new avenues for international collaboration, both to develop elements of the space-based layer and to participate in operations.

Moreover, because no state can have sovereignty over the space above its territory, we could operate up there free of political constraints. The need for negotiating basing rights to locate sensors or interceptor fields would become less pressing.

Improved system performance would give the U.S. leadership a better array of options. In the face of attempted blackmail, for example, the president and his advisors would have confidence in the nation's capabilities to defeat a missile, which would make it possible to avoid more destabilizing moves, such as offensive preventive attacks on enemy territory. It is equally true that strong defenses would support necessary offensive action. Effective defenses can buy time to understand the strategic consequences and overall impact of military action.

Our choices are fundamental to making moral judgments. The moral issues surrounding a national security crisis are tied to considerations of operational effectiveness. Are we doing our best to provide protection against some of the worst weapons imaginable? What would the consequences of not acting be, or of not being able to act because of a blackmail threat? What would be the result if Washington were unable to respond to increased terrorist activity worldwide or an upswing in the global weapons of mass destruction trade? A space-based layer would reinforce American strength, which in turn would allow the U.S. to better defend its interests and pursue its foreign policy goals. A powerful and influential United States is good for world peace, stability, and enforcing the rule of law internationally.

Deterrence advantage- space key/potential public link turn to politics/answer to we change security relations/arms race (also potential econ add on if re-underlined)

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

Modern-day U.S. defense strategy, of necessity, is global in scope, and it will likely retain this character for decades. Fundamental to maintaining this global awareness and presence are satellite operations.

National economic and commercial interrelationships thrive on the flow of invisible ones and zeros through space channels, so that timely, agile intercontinental trade is now taken for granted. U.S. and coalition forces routinely leverage earth-circling platforms to enhance military capabilities: the Global Positioning System for improved navigation and precision timing, reconnaissance and early warning sensors, and high-bandwidth communications. Space, moreover, is an open arena, a global commons increasingly used by many countries for military purposes. The proliferation of space technologies offers foreign governments and nonstate entities unparalleled opportunities to enhance diplomatic and military influence over the U.S. and strike with strategic effect. Potential enemies of the United States today have improved "vision" over the U.S. homeland and battlefield activities, a better sense of direction and geographic position, and an improved ability to mobilize forces and coordinate activities. With battle space now reaching up to at least 22,000 miles above the Earth -- the orbital altitudes for early warning and communications satellites -- protecting ourselves from future attacks will depend mightily on space power.

But the country lacks a unified, coherent approach to expanding the use of space to improve combat effectiveness, a problem that is compounded by a politically charged debate over weapons in space.1 Critics contend that weapons in space would destabilize existing security relationships, precipitate an arms race, undermine U.S. foreign policy, and seed anti-American coalitions. Not only are such criticisms based on questionable assumptions,2 but they also have not persuaded the country to forgo the advantages of space weapons. The most one could say at this stage is that the American people are indifferent, noncommittal, and confused.

Yet given the efficiencies space offers, and given the unpredictable, catastrophic, and global nature of threats we expect to face, it makes sense to explore the possible benefits of taking other combat missions to space. Once the benefits of active space defense programs and operations are made plain, the support of the American people will be forthcoming.

Deterrence advantage- SMD key

Mooney 8 – Kevin Mooney, an investigative reporter and author who writes for several Washington D.C.-area based publications, 9/23/08, “Space-Based Missile Defense Needed to Counter Global Threats, Experts Say,”http://www.cnsnews.com/node/36145

Only a space-based missile defense system capable of intercepting and destroying incoming warheads in the “boost phase” (shortly after they are launched) can adequately protect America from emerging global threats, national security experts told a forum hosted the Heritage Foundation on Tuesday, Sept. 16, 2008.

The ground- and sea-based systems deployed by the U.S. over the past few years are a promising start that can help guard against limited strikes from rogue powers such as North Korea and Iran, the Bush administration maintains.

However, the existing system is not equipped to handle the more sophisticated weaponry and countermeasures that Russia and China are now developing, warned Amb. Hank Cooper, chairman of the missile defense research organization High Frontier.

 Moreover, rogue states like Iran “who know how to play the game” also are testing new missile technology that could be deployed against the U.S. in unconventional ways, Cooper suggested. One nightmare scenario involves a ship-borne Scud missile that could be used to launch and explode a nuclear weapon in the atmosphere over the U.S., creating an electromagnetic pulse that would fry electronics, he warned.

Deterrence advantage- SMD necessary even if other systems exist

Mooney 8 – Kevin Mooney, an investigative reporter and author who writes for several Washington D.C.-area based publications, 9/23/08, “Space-Based Missile Defense Needed to Counter Global Threats, Experts Say,”http://www.cnsnews.com/node/36145

These additional steps are effective as far as they go -- but, ultimately, there is no substitute for a space-based defensive layer that can target enemy warheads in their most vulnerable, earliest stages, Cooper argued.

 “A space-interceptor system is actually multi-layered, in and of itself, because it has a global presence and is capable of intercepting a missile in the boost phase, or mid-course phase, or even in the high endo-atmosphere before the re-entry phase,” he said.

 The boost phase is a “great time” to hit the target because the rocket is still burning, is easy to see, and can be destroyed before any decoys are deployed, Cooper observed.

 In the absence of a space-based defense, there are two systems with boost phase implications currently in development: the Airborne Laser System and Multiple Kill Vehicles. The Airborne Laser is housed inside a modified 747, where it would target moving missiles. Multiple Kill Vehicles, which are much smaller versions of the current crop of anti-missile interceptors, are capable of launching several kill vehicles at one time.

 “Neither system gets us where we need to be,” Kueter acknowledged in his talk.

## Solvency: EMP

SMD prevents an EMP attack and makes BMD systems more effective

Lambakis 7—Steven Lambakis, senior analyst in spacepower and policy studies at the National Institute for Public Policy, February 1, 2007, “Missile Defense From Space” Hoover Institution, Policy Review No. 141, online: http://www.hoover.org/publications/policy-review/article/6124

It is also known that enemies of the United States can put a nuclear weapon over U.S. territory using a ballistic missile. The detonation of this weapon at a high altitude could unleash an electromagnetic pulse that would wipe out satellite and airborne navigation, intelligence, and communications systems and impede any U.S. military response to the aggression. Such a pulse of energy would disable or destroy the unprotected technological infrastructure of a region or the nation. According to the emp Commission, “a regional or national recovery would be long and difficult and would seriously degrade the safety and overall viability of our nation. . . . [A]t some point the degradation of infrastructure could have irreversible effects on the country’s ability to support its population.” Space-based interceptors may be the only effective way to counter this threat and mitigate the effects of an electromagnetic pulse resulting from the intercept. Engaging the missile close to its launch point would release the resulting explosion of gamma rays closer to the attacker’s territory. Relying on an intercept in space, in the midcourse of a missile’s flight, risks damaging unprotected satellites (i.e., just about all commercial and civilian satellites), regardless of who owns them. Because the missile defense system is “layered” and will have multiple elements working together synergistically, sharing information, sharing existing sensors, communicating as a single system worldwide**, even a small constellation of space-based interceptor platforms would allow the entire system to work more efficiently.** The massive constellations projected back in the heady days of the Strategic Defense Initiative, in other words, do not seem to be necessary, especially when the targeted adversaries have very limited ballistic missile inventories. By attacking even just a portion of the threat missiles in boost and midcourse, the space layer has the effect of thinning out the number of attacking missiles so that the other elements of the system, which are based on the ground or at sea (midcourse and terminal systems), can be more effective.

EMP—destroys key infrastructure and decimates space capabilities

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

The EMP Threat According to the 2004 report of the EMP Commission, 85 the United States faces a threat from EMP that could have catastrophic consequences based on even a single nuclear warhead. EMP is generated by any nuclear weapon burst at any altitude above a few dozen kilometers, with the height of burst being significant in determining the area exposed to EMP. The EMP threat arises from the ability, whether by terrorists or states, to launch relatively unsophisticated missiles with nuclear warheads to detonate at altitudes from 40 to 400 kilometers above the earth's surface. The rationale for such action would be the high political-military payoff in the form of devastating consequences. An EMP attack would constitute a highly successful asymmetric strategy against a society as heavily dependent as the United States is on electronics, energy, telecommunications networks, transportation systems, the movement of inventories in its manufacturing sector, and food processing and distribution capabilities. As noted in the EMP Commission report, EMP was an unintended result of a nuclear detonation at an altitude of about 400 kilometers during the Starfish nuclear weapons tests above Johnstone Island in the Central Pacific in 1962. The effects, felt some 1400 kilometers away in Hawaii, included "the failure of street lighting systems, tripping of circuit breakers, triggering of burglar alarms, and damage to a telecommunications relay facility." Nuclear tests conducted by the Soviet Union, also in 1962, produced damage to overhead and underground buried cables at distances as far away as 600 kilometers, together with surge arrester burnout, spark-gap breakdown, blown fuses, and power-supply breakdown.8'' The destruction and mayhem caused by an EMP explosion would be far more substantial today given the ubiquity of electronics and society's increased reliance on them to run critical infrastructures. Several potential enemies either already have, or could soon acquire, the capability to attack the United States with a high-altitude nuclear explosion EMP that would cover a wide geographic region. Such a weapon need not be detonated directly over the United States itself to produce major damage to America's critical infrastructures such as telecommunications, banking and finance, fuel/energy, transportation, food and water supply, emergency services, government activities, and space systems. U.S. satellites, both civilian and military are vulnerable to a range of attacks that include EMP, especially in low-earth orbits. Again, as the EMP Commission concluded, "The national security and homeland security communities use commercial satellites for critical activities, including direct and backup communications, emergency response services, and continuity of operations during emergencies."87 Such satellites could be disabled by collateral radiation effects from an EMP attack on ground targets. Thus it is obvious that an interdependence exists between the objects of a potential EMP attack. Disabling one of the infrastructures, such as telecommunications or electricity, would have severe consequences for others, with cascading effects from which an advanced, technologically dependent society such as the United States might not easily recover. An EMP attack mounted against the United States would have far broader international consequences, given the interdependence of America and other economies in an era of globalization. An EMP attack against other economies, such as Japan or a European nation, would have major effects in the United States, and on other countries if the attack was on the United States. The services that would be essential to cope with the consequences of a terrorist attack, such as hospitals and emergency services, themselves might be disabled and therefore would not be available when and where they were most needed. As Senator John Kyi has pointed out. "A terrorist organization might have trouble putting a nuclear warhead on target' with a Scud, but it would be much easier to simply launch and detonate in the atmosphere. No need for the risk and difficulty trying to smuggle a nuclear weapon over the border or hit a particular city. Just launch a cheap missile from a freighter in international waters -al-Qaeda is believed to own about eighty such vessels - and make sure to get it a few miles in the air."88

Russia/Iran developing tech for EMP attack—SMD is key to prevent that – hardens infrastructure

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

Notably, Russia has considered attack options that include EMP. During the May 1999 NATO air campaign against Serbia, members of the Russian Duma, meeting with U.S. congressional counterparts, reportedly speculated about the paralyzing effects of an EMP attack on the United States.89 To amplify on the Rumsfeld statement cited under "Ship-borne Scud Threat," above, Iran is reported to have tested whether its ballistic missiles, such as the Shahab-3 or the Scud, could be detonated by remote control while still in high-altitude flight. The most plausible explanation for such tests is that Iran is developing the capability to explode a high-altitude nuclear weapon that could destroy critical electronic and technological infrastructures.90 Without an effective missile defense the United States will remain vulnerable to the EMP threat given its extensive dependence on high-tech, electronic infrastructure that cannot easily be hardened to withstand such an attack. The ability to launch an incapacitating EMP strike against the United States provides enemies with an asymmetric threat that would not only inhibit U.S. military action but would also strike a severe economic and psychological blow.

**EMP- turns econ, SMD key to defeat it**

**Kennedy 08** – Brian T. Kennedy, president of the Claremont institute, November 24, 2008, “What a Single Nuclear Warhead Could Do, Why the U.S. needs a space-based missile defense against an EMP attack,” The Wall Street Journal

Think about this scenario: An ordinary-looking freighter ship heading toward New York or Los Angeles launches a missile from its hull or from a canister lowered into the sea. It hits a densely populated area. A million people are incinerated. The ship is then sunk. No one claims responsibility. There is no firm evidence as to who sponsored the attack, and thus no one against whom to launch a counterstrike.

But as terrible as that scenario sounds, there is one that is worse. Let us say the freighter ship launches a nuclear-armed Shahab-3 missile off the coast of the U.S. and the missile explodes 300 miles over Chicago. The nuclear detonation in space creates an electromagnetic pulse (EMP).

Gamma rays from the explosion, through the Compton Effect, generate three classes of disruptive electromagnetic pulses, which permanently destroy consumer electronics, the electronics in some automobiles and, most importantly, the hundreds of large transformers that distribute power throughout the U.S. All of our lights, refrigerators, water-pumping stations, TVs and radios stop running. We have no communication and no ability to provide food and water to 300 million Americans.

This is what is referred to as an EMP attack, and such an attack would effectively throw America back technologically into the early 19th century. It would require the Iranians to be able to produce a warhead as sophisticated as we expect the Russians or the Chinese to possess. But that is certainly attainable. Common sense would suggest that, absent food and water, the number of people who could die of deprivation and as a result of social breakdown might run well into the millions. Let us be clear. A successful EMP attack on the U.S. would have a dramatic effect on the country, to say the least. Even one that only affected part of the country would cripple the economy for years. Dropping nuclear weapons on or retaliating against whoever caused the attack would not help. And an EMP attack is not far-fetched.

Twice in the last eight years, in the Caspian Sea, the Iranians have tested their ability to launch ballistic missiles in a way to set off an EMP. The congressionally mandated EMP Commission, with some of America's finest scientists, has released its findings and issued two separate reports, the most recent in April, describing the devastating effects of such an attack on the U.S.

The only solution to this problem is a robust, multilayered missile-defense system. The most effective layer in this system is in space, using space-based interceptors that destroy an enemy warhead in its ascent phase when it is easily identifiable, slower, and has not yet deployed decoys. We know it can work from tests conducted in the early 1990s. We have the technology. What we lack is the political will to make it a reality. An EMP attack is not one from which America could recover as we did after Pearl Harbor. Such an attack might mean the end of the United States and most likely the Free World. It is of the highest priority to have a president and policy makers not merely acknowledge the problem, but also make comprehensive missile defense a reality as soon as possible.

SMD key to avoid electromagnetic release from nuke weapons- solely relying on them while in space causes destruction to satellites

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

It is also known that enemies of the United States can put a nuclear weapon over U.S. territory using a ballistic missile. The detonation of this weapon at a high altitude could unleash an electromagnetic pulse that would wipe out satellite and airborne navigation, intelligence, and communications systems and impede any U.S. military response to the aggression. Such a pulse of energy would disable or destroy the unprotected technological infrastructure of a region or the nation. According to the emp Commission, "a regional or national recovery would be long and difficult and would seriously degrade the safety and overall viability of our nation. . . . [A]t some point the degradation of infrastructure could have irreversible effects on the country's ability to support its population."

Space-based interceptors may be the only effective way to counter this threat and mitigate the effects of an electromagnetic pulse resulting from the intercept. Engaging the missile close to its launch point would release the resulting explosion of gamma rays closer to the attacker's territory. Relying on an intercept in space, in the midcourse of a missile's flight, risks damaging unprotected satellites (i.e., just about all commercial and civilian satellites), regardless of who owns them.

Serious threat of EMP- can and must be addressed

**Foster et al 4** – Dr. John S. Foster Jr, chairman of the Board of Pilkington Aerospace, Inc. and Chairman of Technology Strategies and Alliances, Earl Gjelde, served as President George Herbert Walker Bush’s Deputy Secretary and Chief Operating Officer of the US Department of the Interior, Dr. William R. Graham, NASA Deputy Administrator, Dr. Robert J. Hermann, Chairman of the Board 1998-00 American National Standards Institute, Vice President for Corporate Development at SAIC, GEN Richard L. Lawson, USAF (Ret.), Dr. Gordon K. Soper employed by Defense Group Inc, Dr. Lowell L. Wood, Jr., a scientist-technologist who has contributed to technical aspects of national defense, “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack,” Volume 1: Executive Report 2004, http://www.empcommission.org/docs/empc\_exec\_rpt.pdf

Several potential adversaries have or can acquire the capability to attack the United States with a high-altitude nuclear weapon-generated electromagnetic pulse (EMP). A determined adversary can achieve an EMP attack capability without having a high level of sophistication.

**EMP is one of a small number of threats that can hold our society at risk of catastrophic consequences**. EMP will cover the wide geographic region within line of sight to the nuclear weapon. It has the capability to produce significant damage to critical infrastructures and thus to the very fabric of US society, as well as to the ability of the United States and Western nations to project influence and military power.

The common element that can produce such an impact from EMP is primarily electronics, so pervasive in all aspects of our society and military, coupled through critical infrastructures. Our vulnerability is increasing daily as our use of and dependence on electronics continues to grow. The impact of EMP is asymmetric in relation to potential protagonists who are not as dependent on modern electronics.

The current vulnerability of our critical infrastructures can both invite and reward attack if not corrected. Correction is feasible and well within the Nation's means and resources to accomplish.

\*\*\*Deterrence\*\*\*

## Generic

Aff key to deterrence- Current satellites face too many limitations

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

Political, strategic, and technological uncertainties could change the missile defense scenario by causing a shift in the threat from one region to another. Given that it takes years to field, test, and make operational new fixed interceptor and sensor sites, a shift in the threat could leave the nation vulnerable. Because many of the interceptors and sensors in the current system are fixed to geographic points, we are limited in our ability to defend the homeland, for example, against missiles launched from surprise locations such as a ship off our shoreline. We also might face an adversary tomorrow that deploys tens or even hundreds of ballistic missiles or one that has more sophisticated countermeasure and reentry technologies. Those, too, would be expected to stress the current system, which is designed at the moment to deal with more limited threats.

Planned transportable land-based and mobile sea-based and airborne systems also suffer limitations. The need to base sensors and interceptors forward, closer to threat launch sites, in order to enlarge the engagement battle space makes our security dependent on political decisions by foreign governments. Projected boost defense systems, which may be deployed to the periphery or littoral of an adversary, would have very limited or no utility against a ballistic missile launched from several hundred miles inside a threat country's border. The inability to engage a missile in boost means we would be left with only midcourse or terminal intercept possibilities, if those are available, and this removes a layer from the effectiveness calculations.

Space key- only effective way to deter weapons that initiate in space

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

Today we base missile-defense weapons on Earth, yet most engagements actually take place high above the Earth's surface, in space -- unless, of course, those engagements occur very early in boost or late in terminal. Putting interceptors in space to engage ballistic missiles could offer efficiencies that go a long way towards improving national defense, protecting more areas around the world, and reacting more effectively to threat surprises.

The Exoatmospheric Kill Vehicle (ekv), deployed on top of a long-range ground-based interceptor in Alaska and California, is really a euphemism for "space weapon." Space is the only environment in which the ekv will operate. In order to perform the missile defense mission, it must be boosted into space where it is "based" for a short time and operates semi-autonomously to put itself onto a collision path with a hostile warhead. In other words, the ekv is a "space weapon" that just happens to spend most of its time on the ground. The Standard Missile-3 interceptor, while it is carried on Aegis ballistic missile defense ships, also executes the intercept endgame in space against short- to medium-range ballistic missiles using a sensor-propulsion package designed to collide with the target.

Thus, despite the fact that space is the recognized battleground in many missile defense engagements, we are deploying "space weapons" that are restricted to terrestrial launching just prior to operation. They must fight a space war from Earth. So, in a sense, these terrestrial-based interceptors are out of position before the battle even begins. At the very least, they are not in the most advantageous position to accomplish the mission for which they were designed.

Before we can even begin the launch sequence, battle managers must wait for the attacker to make his move. The attacker has a head start and the ability to pre-position before the defender can get to the point where he must engage, especially if we are talking about engagement in the midcourse phase of flight. These engagements take place over a matter of minutes, of course, so any time wasted getting into position could lead to a failed intercept and possibly devastation for a city. By not basing interceptors in space, by not pre-positioning assets in the environment where we know intercepts will take place, the defense is surrendering a fundamental positional advantage. On this point, there is relevance in Carl von Clausewitz's observation that a "benefit [of defensive action], one that arises solely from the nature of war, derives from the advantage of position, which tends to favor the defense."9 To give up this advantage is detrimental to the cause.

Aff solves deterrene and doesn’t change the power balance

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

Modern-day U.S. defense strategy, of necessity, is global in scope, and it will likely retain this character for decades. Fundamental to maintaining this global awareness and presence are satellite operations.

National economic and commercial interrelationships thrive on the flow of invisible ones and zeros through space channels, so that timely, agile intercontinental trade is now taken for granted. U.S. and coalition forces routinely leverage earth-circling platforms to enhance military capabilities: the Global Positioning System for improved navigation and precision timing, reconnaissance and early warning sensors, and high-bandwidth communications. Space, moreover, is an open arena, a global commons increasingly used by many countries for military purposes. The proliferation of space technologies offers foreign governments and nonstate entities unparalleled opportunities to enhance diplomatic and military influence over the U.S. and strike with strategic effect. Potential enemies of the United States today have improved "vision" over the U.S. homeland and battlefield activities, a better sense of direction and geographic position, and an improved ability to mobilize forces and coordinate activities. With battle space now reaching up to at least 22,000 miles above the Earth -- the orbital altitudes for early warning and communications satellites -- protecting ourselves from future attacks will depend mightily on space power.

But the country lacks a unified, coherent approach to expanding the use of space to improve combat effectiveness, a problem that is compounded by a politically charged debate over weapons in space.1 Critics contend that weapons in space would destabilize existing security relationships, precipitate an arms race, undermine U.S. foreign policy, and seed anti-American coalitions. Not only are such criticisms based on questionable assumptions,2 but they also have not persuaded the country to forgo the advantages of space weapons. The most one could say at this stage is that the American people are indifferent, noncommittal, and confused.

Yet given the efficiencies space offers, and given the unpredictable, catastrophic, and global nature of threats we expect to face, it makes sense to explore the possible benefits of taking other combat missions to space. Once the benefits of active space defense programs and operations are made plain, the support of the American people will be forthcoming.

Ballistic Missile Defense in space solves deterrence

Frederick 9 – Lt Col Lorinda A. Frederick, USAF, BA, Michigan State University; MBA, Regis University; Master of Military Operational Art and Science, Air Command and Staff College; Master of Airpower Art and Science, School of Advanced Air and Space Studies, 9/1/09, “Deterrence and Space-Based Missile Defense,” Air and Space Power Journal, Fall 2009

Many characteristics of SBMD could create uncertainty in the minds of potential adversaries about whether or not they could achieve their aims.48 Space provides access to threats in areas that terrestrial, maritime, and airborne defenses cannot reach. SBMD is capable of destroying ballistic missiles over the enemy’s territory before they release multiple reentry vehicles or countermeasures designed to thwart defenses. The constant forward presence of SBMD could allow the United States to limit its military footprint on foreign soil and support many military operations simultaneously. Land- and sea-based interceptors have to be placed in areas where they can provide credible protection from ballistic missile attacks. Pre-positioning infrastructure, supplies, and equipment may shorten response times when hostilities erupt, but they are costly and difficult to sustain. SBMD allows a nonintrusive forward presence because it does not require the pre-positioning of assets on other territories. Furthermore, employing SBMD is not contingent on approval from another nation. The continued presence of US assets on foreign soil depends on the host nation’s accepting or approving the mission that those assets support. If defenses are not in position, deterrence is reduced. Stationed in the right orbits in the right quantities, SBMD could deter or defend against attacks around-the-clock, especially if used in concert with other sea- and land-based missile defenses.

SMD critical to destroying warheads in “boost phase”

Mooney 8 – Kevin Mooney, an investigative reporter and author who writes for several Washington D.C.-area based publications, 9/23/08, “Space-Based Missile Defense Needed to Counter Global Threats, Experts Say,”http://www.cnsnews.com/node/36145

Only a space-based missile defense system capable of intercepting and destroying incoming warheads in the “boost phase” (shortly after they are launched) can adequately protect America from emerging global threats, national security experts told a forum hosted the Heritage Foundation on Tuesday, Sept. 16, 2008.

The ground- and sea-based systems deployed by the U.S. over the past few years are a promising start that can help guard against limited strikes from rogue powers such as North Korea and Iran, the Bush administration maintains.

However, the existing system is not equipped to handle the more sophisticated weaponry and countermeasures that Russia and China are now developing, warned Amb. Hank Cooper, chairman of the missile defense research organization High Frontier.

 Moreover, rogue states like Iran “who know how to play the game” also are testing new missile technology that could be deployed against the U.S. in unconventional ways, Cooper suggested. One nightmare scenario involves a ship-borne Scud missile that could be used to launch and explode a nuclear weapon in the atmosphere over the U.S., creating an electromagnetic pulse that would fry electronics, he warned.

SMD necessary to deterrence even if other systems exist

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These additional steps are effective as far as they go -- but, ultimately, there is no substitute for a space-based defensive layer that can target enemy warheads in their most vulnerable, earliest stages, Cooper argued.

 “A space-interceptor system is actually multi-layered, in and of itself, because it has a global presence and is capable of intercepting a missile in the boost phase, or mid-course phase, or even in the high endo-atmosphere before the re-entry phase,” he said.

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 “Neither system gets us where we need to be,” Kueter acknowledged in his talk.

Tech is currently feasible and the aff solves deterrence

Pfaltzgraff 8 – Dr. Robert L. Pfaltzgraff jr., President, the Institute for Foreign Policy Analysis and Shelby Cullom Davis Professor of International Security Studies, The Fletcher School of Law and Diplomacy, Tufts University, December 15, 2008, “Space And U.S. Security A Net Assessment,” The Institute for Foreign Policy Analysis,http://www.ifpa.org/pdf/Space\_and\_U\_S\_Security\_Net\_Assessment\_Final\_Dec15\_08.pdf

The proliferation of ballistic missiles and weapons of mass destruction (WMD) and their possession by grow- ing numbers of adversaries, ranging from traditional strategic competitors to terrorist organizations, pose a serious and growing threat to the United States, its civilian population and deployed military forces, and friends and allies. This threat encompasses:

• • •

States such as North Korea and Iran which are working hard to acquire (or already possess) WMD and the means to deliver them;

Strategic competitors, Russia and China, which are extending the sophistication of their strategic arsenals in terms of warhead accuracy, countermeasures, and delivery systems;

Terrorist groups, which are making concerted efforts to obtain WMD that would enable them to conduct chemical, biological, radiological, or nuclear attacks; and

Threats are increasing at a pace that may not give the United States the luxury of lengthy timelines to develop and deploy a missile defense against them. A global layered defense capability is necessary to counter these threats. Near-term options exist for developing viable space-based defenses within the next decade resulting in a comprehensive, global layered missile defense system. This option would complement the system currently being deployed but afford superior coverage at less cost than expanding the number of GMD sites beyond those already planned in the United States and in Europe. Layered defenses provide multiple opportunities to destroy attacking missiles in all three phases of flight from any direction regardless of their geographic starting point. Furthermore, a layered defense makes the countermeasures available to the offensive systems much less effective than would be the case if interdiction was only possible in one (or two) phase(s) of the missile’s flight. Boost phase intercepts, most efficiently conducted by components deployed in space, are particularly desirable because a missile is most vulnerable during this segment since it is relatively slow moving, presents a readily identifiable target (bright rocket plume), and has not released any of its warheads or countermeasures which would complicate interception in subsequent phases. Boost phase interception has the added advantage that the missile’s payload may, depending on how early interdiction occurs, fall back on the attacking nation. This situation could deter the launching state if it is confronted with the likelihood of serious damage to its own territory. In addition, depending on the number of assets deployed, a space-based boost-phase defense could always be on station on a world-wide basis, unfettered by sovereignty issues of overflight and operations on another nation’s territory.

SMD Key to global deterrence capability

Lambakis 7 – Steven Lambakis, pHd, national security and international affairs analyst specializing in space power and policy studies for National Institute for Public policy, March 2007, “Leveraging Space to Improve Missile Defense” High Frontier, The Journal for Space & Missile professionals, Volume 3, Number 2

The important point here is that, all at once, a space-based layer of weapons gives the current missile defense system a true global engagement capability. Without space, the only way to deal with threat uncertainty is to populate the world with fixed and mobile sensors and radars (on ground and at sea). As you might imagine, the cost of doing so would be prohibitive, and would probably not be politically sustainable.

Without a space-based layer, missile defenses would con- tinue to require numerous bilateral and multilateral agreements with our allies and friends to host various missile defense assets. And there would continue to be a risk that these assets would not be properly positioned to defend against a particular threat. Space-based interceptors introduce flexibility and a near-global coverage capability into the system, they can offer a very cost- effective and, from one perspective, politically-efficient option for dealing with an uncertain and evolving threat.

SMD critical to space control and outweighs drawbacks

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

The benefits of space-based defense are manifold. The deployment of a robust global missile defense that includes space-based interdiction capabilities will make more expen- sive, and therefore less attractive, the foreign development of offensive ballistic missile technologies needed to over- come it. Indeed, the enduring lesson of the ABM Treaty era is that the absence of defenses, rather than their presence, empowers the development of offensive technologies that can threaten American security and the lives of American citizens. And access to space, as well as space control, is key to future U.S. efforts to provide disincentives to an array of actors seeking such power.

Current system fail yet people are gaining weapons in the status quo- Aff is key to deterrence

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Missile defense has entered a new era. With the initial missile defense deployments, the decades-long debate over wheth- er to protect the American people from the threat of ballis- tic missile attack was settled – and settled unequivocally in favor of missile defense. What remains an open question is how the American missile defense system will evolve in the years ahead to take maximum advantage of technological opportunities to meet present and emerging dangers.

There is ample reason for concern. The threat environ- ment confronting the United States in the twenty-first cen- tury differs fundamentally from that of the Cold War era. An unprecedented number of international actors have now acquired – or are seeking to acquire – ballistic missiles and weapons of mass destruction. Rogue states, chief among them North Korea and Iran, place a premium on the acqui- sition of nuclear, chemical, and biological weapons and the means to deliver them, and these states are moving rapid- ly toward that goal. Russia and China, traditional competi- tors of the United States, continue to expand the range and sophistication of their strategic arsenals at a time when the United States debates deep reductions in its strategic nu- clear forces beyond those already made since the end of the Cold War and has no current modernization program. With a new administration, furthermore, the future development of even our limited missile defense system is in question. Furthermore, a number of asymmetric threats – including the possibility of weapons of mass destruction (WMD) ac- quisition by terrorist groups or the devastation of American critical infrastructure as a result of electromagnetic pulse (EMP) – now pose a direct challenge to the safety and se- curity of the United States. Moreover, the number and so- phistication of these threats are evolving at a pace that no longer allows the luxury of long lead times for the develop- ment and deployment of defenses.

In order to address these increasingly complex and mul- tifaceted dangers, the United States must move well beyond the initial missile defense deployments of recent years to deploy a system capable of comprehensively protecting the American homeland as well as U.S. overseas forces and al- lies from the threat of ballistic missile attack. U.S. defenses also must be able to dissuade would-be missile possessors from costly investments in missile technologies, and to de- ter future adversaries from confronting the United States with WMD or ballistic missiles. America’s strategic objec- tive should be to make it impossible for any adversary to influence U.S. decision making in times of conflict through the use of ballistic missiles or WMD blackmail based on the threat to use such capabilities.

These priorities necessitate the deployment of a system capable of constant defense against a wide range of threats in all phases of flight: boost, midcourse, and terminal. A lay- ered system – encompassing ground-based (area and the- ater anti-missile assets) and sea-based capabilities – can provide multiple opportunities to destroy incoming missiles in various phases of flight. A truly global capability, howev- er, cannot be achieved without a missile defense architec- ture incorporating interdiction capabilities in space as one of its key operational elements. In the twenty-first centu- ry, space has replaced the seas as the ultimate frontier for commerce, technology, and national security. Space-based missile defense affords maximum opportunities for inter- ception in boost phase before rocket boosters have released warheads and decoys or penetration aids.

Space Based Missile defense reinforces American leadership

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

The policy benefits of a space-based missile defense layer are straightforward. A more effective missile defense system that fully leverages space would provide a true on-call global defensive capability, and this could lead to increased stability in the world. Defenses deter attacks by reducing confidence in the success of any attack. The more effective the missile defense system is, the greater will be its deterrence value, and the less likely will we be to have to use it at all.

At some point, when the system is seen by other governments as highly effective, they could recognize a diminishing marginal rate of return in their own ballistic missile investments. As more allies invest in missile defense, U.S. space-basing activities could build on current missile defense cooperative activities and open up new avenues for international collaboration, both to develop elements of the space-based layer and to participate in operations.

Moreover, because no state can have sovereignty over the space above its territory, we could operate up there free of political constraints. The need for negotiating basing rights to locate sensors or interceptor fields would become less pressing.

Improved system performance would give the U.S. leadership a better array of options. In the face of attempted blackmail, for example, the president and his advisors would have confidence in the nation's capabilities to defeat a missile, which would make it possible to avoid more destabilizing moves, such as offensive preventive attacks on enemy territory. It is equally true that strong defenses would support necessary offensive action. Effective defenses can buy time to understand the strategic consequences and overall impact of military action.

Our choices are fundamental to making moral judgments. The moral issues surrounding a national security crisis are tied to considerations of operational effectiveness. Are we doing our best to provide protection against some of the worst weapons imaginable? What would the consequences of not acting be, or of not being able to act because of a blackmail threat? What would be the result if Washington were unable to respond to increased terrorist activity worldwide or an upswing in the global weapons of mass destruction trade? A space-based layer would reinforce American strength, which in turn would allow the U.S. to better defend its interests and pursue its foreign policy goals. A powerful and influential United States is good for world peace, stability, and enforcing the rule of law internationally.

Robust missile defense system key to deterrence

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Misile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Given this multiplicity of ballistic missile threats, the Unit- ed States must deploy a missile defense that deters hostile states from developing or acquiring missile capabilities that could threaten the United States, its allies and coalition part- ners, and its forces deployed abroad. Furthermore, America’s missile defense R&D programs, together with planned de- ployments, must be sufficiently robust to dissuade would-be missile possessors from attempting to challenge the United States. Washington must deter future enemies from acquir- ing ballistic missiles, just as in the past it dissuaded them from developing strategic bombers because of America’s abil- ity to overwhelm such systems. Finally, U.S. missile defense must be capable of defeating those ballistic missiles, what- ever their range and type, that could be launched against the United States.

**Threat of missiles by other nations is greater than econ crisis and is real**

**Kennedy 08** – Brian T. Kennedy, president of the Claremont institute, November 24, 2008, “What a Single Nuclear Warhead Could Do, Why the U.S. needs a space-based missile defense against an EMP attack,” The Wall Street Journal

As severe as the global financial crisis now is, it does not pose an existential threat to the U.S. Through fits and starts we will sort out the best way to revive the country's economic engine. Mistakes can be tolerated, however painful. The same may not be true with matters of national security.

Although President George W. Bush has accomplished more in the way of missile defense than his predecessors -- including Ronald Reagan -- he will leave office with only a rudimentary system designed to stop a handful of North Korean missiles launched at our West Coast. Barack Obama will become commander in chief of a country essentially undefended against Russian, Chinese, Iranian or ship-launched terrorist missiles. This is not acceptable.

The attacks of Sept. 11, 2001, have proven how vulnerable we are. On that day, Islamic terrorists flew planes into our buildings. It is not unreasonable to believe that if they obtain nuclear weapons, they might use them to destroy us. And yet too many policy makers have rejected three basic facts about our position in the world today:

First, as the defender of the Free World, the U.S. will be the target of destruction or, more likely, strategic marginalization by Russia, China and the radical Islamic world.

Second, this marginalization and threat of destruction is possible because the U.S. is not so powerful that it can dictate military and political affairs to the world whenever it wants. The U.S. has the nuclear capability to vanquish any foe, but is not likely to use it except as a last resort.

Third, America will remain in a condition of strategic vulnerability as long as it fails to build defenses against the most powerful political and military weapons arrayed against us: ballistic missiles with nuclear warheads. Such missiles can be used to destroy our country, blackmail or paralyze us.

Ground base satellite aren’t sufficient- no tests and can’t survive counter-measures

**Wright 10** – David Wright, senior scientist and co-director of the Global Security Program at the Union of Concerned Scientists (UCS). Expert on missile defense, August 9, 2010, “All Things Nuclear,” Insights on Science and Security, “Dangerous Definitions,” http://allthingsnuclear.org/post/927606161/dangerous-definitions

What about reliability? The test record of the GMD system is not good enough to claim the defense is reliable, even against missiles without countermeasures. The system has had few intercept tests under a very limited set of conditions. And even in that case the test record has not been great. The Pentagon has only conducted six intercept tests of the GMD system since the decision to field the system was made in December 2002, and half of those have failed. So even with a creative definition of “limited attacks” the statement that the U.S. is “currently protected” is not true.

What about the statement that the Aegis missile defense system is “proven”? The current Aegis interceptor (SM-3 Block 1A), is intended to intercept missiles up to about 1,500 km range. The Pentagon considers the Aegis anti-missile system “proven” – even though it has not been tested against missiles with countermeasures – because it defines the threat Aegis may face to be missiles without countermeasures. The argument seems to be that the most likely threat from Iran is an attack by potentially large numbers of conventionally armed missiles, to which Iran would not bother to add countermeasures, even if it could make them.

This argument is questionable for various reasons. Even if this is the threat, the statement that Aegis is “proven” is not true in any meaningful sense. As with the GMD tests, the Aegis tests have been done under a limited set of controlled conditions, and to argue that this means the system is “proven” against attacks under other conditions is wishful thinking, and should not be the basis of military planning.

AT: Only limited attacks- improvements are necessary, current BMD can’t surivive “limited” attacks

**Wright 10** – David Wright, senior scientist and co-director of the Global Security Program at the Union of Concerned Scientists (UCS). Expert on missile defense, August 9, 2010, “All Things Nuclear,” Insights on Science and Security, “Dangerous Definitions,” http://allthingsnuclear.org/post/927606161/dangerous-definitions

From a technical perspective, the Obama administration’s approach to missile defense has been particularly disappointing – and is potentially dangerous. Originally the administration said it would require missile defenses to be “proven,” implying that these systems would finally be subjected to rigorous and realistic testing, which was absent during the Bush administration. We have long advocated such testing.

So it was surprising when (a) the administration’s Ballistic Missile Defense (BMD) Review stated that “The United States is currently protected against limited ICBM attacks,” and (b) the President called the Aegis missile defense system “proven” in the announcement of his proposed European system in September 2009.

Neither of these statements are true in any meaningful sense. Neither the Aegis system nor the Ground-Based Midcourse Defense (GMD) system fielded in Alaska and California has been subjected to realistic tests against the kind of attacks and under the conditions you would expect in the real-world. Neither system is “proven” in the usual sense of that term.

The technical people at OSTP and the Pentagon clearly understand these issues, so what’s going on here?

The Pentagon is using sleight of hand: it is defining the “threat” very narrowly – as something the defense may be able to defend against – and then exaggerating the system’s ability to deal with that threat.

Consider the BMD Review statement that the United States is “currently protected against limited ICBM attacks.” For the United States to be “protected” against missile attacks, the missile defense would have to be able to stop missiles fired at the U.S. and be able to do so reliably. As we discuss below, there’s no evidence it can do either against a real-world attack.

The Pentagon has defined a “limited missile attack” as an attack by a limited number of missiles, and by missiles that have no countermeasures, or very simple countermeasures that the defense knows about in detail in advance.

So it argues that if the anti-missile system can see an object and maneuver to hit it – which is what the tests of the GMD and Aegis systems have so far been about – then it might be able to hit a missile attacking the U.S. if that missile carries no countermeasures.

But it makes no sense to assume that North Korea, Iran, or any other country would spend years developing a long-range missile to hit the U.S. – and have the technical expertise to do so – and not have some of its aerospace engineers also design countermeasures that would make the missiles effective against defenses it knows the U.S. has been building. Countermeasures would not be an afterthought.

As both the U.S. intelligence community and our Countermeasures report found, effective decoys and other countermeasures can be built with less sophisticated technology than is needed for a long-range missile and nuclear warhead. The 1999 National Intelligence Estimate by the U.S. National Intelligence Council stated

Multi-Layered SMD prevents an initial launch

**Goure 9** – Daniel Goure, Ph.D., 4-3-9, “U.S. Security Strategy and Boost Phase Missile Defense,” http://www.lexingtoninstitute.org/us-security-strategy-and-boost-phase-missile-defense1?a=1&c=1129

Any U.S. missile defense system needs to be multi-layered. Terminal defenses alone are insufficient operationally and leave the initiative in the hands of the attacker. An attacker can hope to overwhelm a terminal system or simply force the defender to play a guessing game with respect to what targets to defend. Even if an intercept is successful, a terminal-only defense still permits debris to rain down on an area around the target.

Layered defenses offer a number of advantages including more engagement opportunities, the ability to use different phenomenology and attack mechanisms against the missile or its payload, the ability to undermine countermeasure strategies, and the ability by the defense to apply preferential engagement strategies. A layered system takes the initiative away from the attacker. The more layers there are, the more effective the defense and the greater the ability to both defeat an attack and defend targets.

Mobility is another characteristic that should be part of any missile defense architecture. Mobile defenses can respond to changes in the threat, reinforce fixed defenses or address the emergence of new threats. Mobile defenses can be less politically difficult for friends and allies to accept than fixed deployments.

With the addition of boost phase systems, the United States will be able to provide a layered defense and seize the initiative from the attacker. A boost phase system operates in that portion of the flight trajectory when a ballistic missile is most vulnerable and countermeasures the most difficult to employ. Boost phase defenses are particularly useful against long-burning missiles such as those being developed by North Korea and Iran. At the same time, a boost phase system is relatively less effective against shorter-burning missiles such as those deployed by Russia.

A boost phase capability is particularly valuable in the absence of adequate midcourse discrimination or in the presence of complex threats employing countermeasures. A boost system will still need capable sensors to provide rapid and accurate target tracking.

## MD k2 deterrence

Robust missile defense system key to deterrence

Institute for Foreign Policy Analysis 6 – Independent Working Group on Misile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Given this multiplicity of ballistic missile threats, the Unit- ed States must deploy a missile defense that deters hostile states from developing or acquiring missile capabilities that could threaten the United States, its allies and coalition part- ners, and its forces deployed abroad. Furthermore, America’s missile defense R&D programs, together with planned de- ployments, must be sufficiently robust to dissuade would-be missile possessors from attempting to challenge the United States. Washington must deter future enemies from acquir- ing ballistic missiles, just as in the past it dissuaded them from developing strategic bombers because of America’s abil- ity to overwhelm such systems. Finally, U.S. missile defense must be capable of defeating those ballistic missiles, what- ever their range and type, that could be launched against the United States.

BMD checks rogue states

-kills momentum

- try to kill civilians

- win psychology of the battle

- ABL has ineffective range and is limited

- SBMD destroys morale of attacking countries, shortening conflicts

Dinerman 8- Taylor Dinerman is a Senior Editor at the Hudson Institute’s New York office, and a part time consultant for the US Defense Department, September 8, 2008, “Space-based missile defense and the psychology of warfare”, The Space Review, http://www.thespacereview.com/article/1205/1

It is exactly this need for revenge that should get the attention of those in the US government who are trying to design a realistic missile defense policy for the next fifty years. Tyrannical regimes and terrorist movements share the need to excite people with dramatic and violent events. The more spectacular the attack, the better. Firing long-range missiles at an enemy, even if you only hit an empty parking lot, can provide followers with a level of emotional satisfaction. This in turn can motivate them to continue to fight even in a seemingly hopeless battle.

In future wars, those who are fighting against the West—today Iran or North Korea, tomorrow, who knows?—will use ballistic missiles not only to terrorize enemy civilian populations but to build morale among their own forces and people. Missile defense is the key to winning this critical psychological battle. As long as their missiles are being shot out of the sky, claims that they are hurting the enemy and thus filling people’s need for revenge can be shown to be utterly empty.

This, however, cannot be done with terminal phase defense weapons. To hit a missile or a warhead that is descending towards its target may be a feat of technological skill, but it does nothing to decrease the emotional satisfaction that comes from striking a hated enemy. Midcourse interceptors such as the US GBI or the Israeli Arrow are better, but the best way to publicly humiliate those who are launching Scud-type missiles is to shoot them down as soon after they leave the launch pad as possible. The only weapon now in development that will—in theory—be able to do this is the Airborne Laser (ABL), which the Missile Defense Agency plans to test next year.

This is indeed a promising system, but it has its limits. Its range is, according to unclassified reports, about 300 kilometers, and the US only plans to build, at most, seven aircraft. If the goal is to prevent the enemy from using its missile attacks to build its own side’s morale and thus lengthen the war, another solution must be found.

Space-based interceptors, such as a new version of the Brilliant Pebbles program that was canceled in 1993, could, in combination with space- and ground-based sensors, knock down missiles of this type in the boost phase. Significantly, they would do so over the launching country’s own territory and at least some of the citizens would witness the destruction of their leader’s vengeance weapons. This news would spread through word of mouth. This might be one of the keys to undermining their will to make war and help shorten the conflict.

## Layer Missile Defense Key

Layered Defense needed

Near term (within a decade) options exist for comprehensive system

Allow to destroy in all 3 phases

Make counter measures less effective because can destroy in all 3 phases

Boostphase (lasers) are the best

Space based don’t need to operate on another countries territory

Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 128-129

A global layered defense capability is necessary to counter these threats. Near-term options exist for augmenting seabased defenses and deploying space-based defenses within the next decade, resulting in a comprehensive, global layered missile defense system. Layered defenses provide multiple opportunities to destroy attacking missiles in all three phases of flight from any direction regardless of their geographic starting point. Furthermore, a layered defense makes the countermeasures available to the offensive systems much less effective than would be the case if interdiction was only possible in one (or two) phase(s) of the missile’s flight. Boostphase intercepts, most effciently conducted by components deployed in space, are particularly desirable because a missile is most vulnerable during this segment since it is relatively slow moving, presents a readily identifiable target (bright rocket plume), and has not released any of its warheads or countermeasures that would complicate interception in subsequent phases. Boost-phase interception has the added advantage that the missile’s payload may, depending on how early interdiction occurs, fall back on the attacking nation. This situation could deter the launching state if it is confronted with the likelihood of serious damage to its own territory. In addition, depending on the number of assets deployed, a space-based boost-phase defense could always be on station on a world-wide basis, unfettered by sovereignty issues of overflight and operations on another nation’s territory.

## Current MD fails

Current deterrence fails

-rogue states have missiles

-current missile defenses suck

Frederick 9- Lt Col Lorinda A. Frederick, USAF, Master of Airpower Art and Science, School of Advanced Air and Space Studies, Air & Space Power Journal Fall 2009 – Volume XXIII, No. 3, No. AFRP 10-1, <http://www.airpower.au.af.mil/airchronicles/apj/apj09/fal09/frederick.html#frederick>

During the Cold War, the United States relied on the nuclear triad to deter ballistic missile threats emanating from the Soviet Union. Today, the threat is expanding to include rogue elements and proliferators of missile technologies undeterred by Cold War methods. Missile technology is growing despite political attempts to stop it. The United States and other nations are fielding advanced missile defenses to counter the threat posed by proliferating ballistic missiles. However, this air-, land-, and sea-based missile defense architecture lacks redundancy and depends on the proper positioning of assets to intercept missiles in their midcourse and terminal phases of flight. This architecture also lacks a reliable capability to intercept missiles during the boost phase—a capability perhaps best provided from space.

Concerns about current program

Back to back flight test for ground based systems

Funding getting cut for GDM means it wont be effective

GDM is the only missile defense system we have for long range missiles

Current program has a lot of development and testing risk

Turner 11- Michael Turner is Chairman of the House Armed Services Subcommittee on Strategic Forces, March 31, 2011, ““Turner Opening Statement for Hearing on Missile Defense Budget Request”, FY 2012 National Defense Authorization Budget Request for Missile Defense <http://armedservices.house.gov/index.cfm/hearings-display?ContentRecord_id=89441441-8d59-4d7b-a3e6-a9ca2f87fa61&Statement_id=71399417-21db-482f-bae5-99a6c94c36fb&ContentType_id=14f995b9-dfa5-407a-9d35-56cc7152a7ed&Group_id=13e47ffa-0753-47a7-ad5e-1ba7592015c9&MonthDisplay=3&YearDisplay=2011>

U.S. Congressman Mike Turner (R-Ohio), Chairman of the House Armed Services Subcommittee on Strategic Forces, released the following opening statement in conjunction with the subcommittee’s hearing on the Administration’s Fiscal Year 2012 budget request for missile defense programs:

“Members have several issues they want to address today, so I will keep my remarks brief and would ask our witnesses to summarize their statements so we can spend the bulk of our time on questions and discussion.

“First, I am deeply concerned about the Ground-based Midcourse Defense (GMD) system in Alaska and California. The back-to-back flight test failures this past year raise doubts about the reliability and effectiveness of this capability. I had the opportunity to talk with General O’Reilly yesterday, and I appreciate his efforts to establish a rigorous failure review and mitigation process. However, I question the Administration’s long-term commitment to ‘getting it right.’

“While I understand there are some changes to the program this year, I have also observed the funding for GMD plummet over the past few years. In Fiscal Year 2010, the President’s budget request slashed it by $445 million. Last year, we saw a restoration of some funds, but then again this year, the program is cut by $185 million. Furthermore, the outyear spending profile for GMD is $1 billion less than was projected a year ago. With these levels of cuts, it is clear that something will be broke or something won’t get done. I worry that these test failures may be a harbinger of further setbacks if we don’t make GMD a priority and devote the resources necessary to make it right. After all remember what is at stake: GMD is currently the only missile defense system that protects the United States homeland from long-range ballistic missile attacks. We have to get it right.

“Second, a year ago, I was highly critical of the Administration for the lack of information it was providing to Congress on the Phased Adaptive Approach (PAA) for missile defense in Europe. In the past several months, we have seen significant improvement in engagement with our committee, and I want to commend our witnesses for that.

“Last month while in Brussels, I had the opportunity to meet with Admiral Stavridis and other NATO and European Command officials to discuss progress in PAA implementation. I also met with NATO parliamentarians and was pleased to see how far the missile defense discussion in Europe had advanced from three years ago.

“No doubt, there is significant work ahead that I would ask our witnesses to discuss today. On the policy front, a near-term decision must be made on where to locate a forward-based X-band radar. Charting a path forward with Russia while also protecting our interests will continue to be challenging.

“On the programmatic front, there is a substantial amount of development and testing required to ensure new systems and technologies planned for PAA are ‘proven.’ There are still considerable technology risk reduction activities that must be accomplished in the Standard Missile (SM)-3 Block 2-A and Block 2-B programs; both of which are key to protecting Europe and the U.S.

Missile defense programs that should be cut

We are spending 800 million on a program that wont be deployed

Need to invest in innovative science and technology

ABL wont be implemented well

Turner 11- Michael Turner is Chairman of the House Armed Services Subcommittee on Strategic Forces, March 31, 2011, ““Turner Opening Statement for Hearing on Missile Defense Budget Request”, FY 2012 National Defense Authorization Budget Request for Missile Defense <http://armedservices.house.gov/index.cfm/hearings-display?ContentRecord_id=89441441-8d59-4d7b-a3e6-a9ca2f87fa61&Statement_id=71399417-21db-482f-bae5-99a6c94c36fb&ContentType_id=14f995b9-dfa5-407a-9d35-56cc7152a7ed&Group_id=13e47ffa-0753-47a7-ad5e-1ba7592015c9&MonthDisplay=3&YearDisplay=2011>

“Some of us also remain concerned about the Department’s hedging strategy for defense of the homeland in case the long-range threat comes earlier or technical issues arise in the development of a new SM-3 interceptor. I came away from our PAA[Phased Adaptive Approach] hearing last December believing that the Department’s hedging strategy was hollow. Since then, I understand the Department has worked in earnest to develop the strategy, and I hope our witnesses can discuss some of this.

“Third, the budget request contains approximately $400 million in 2012 and another $400 million in 2013 for the Medium Extended Area Defense System (MEADS)— a joint U.S., German and Italian missile defense system that the Department does not plan to continue beyond design and development due to cost and schedule overruns. I understand the government’s contract termination obligations, but spending $800 million—in this budget environment—on a program that is not going forward into production makes no sense. These resources could be better spent on other missile defense priorities. Is the Department looking at options to lower this liability?

“Fourth, we need to continue to invest in innovative science and technology. Last year, our committee expressed bipartisan concern that the budget request for Directed Energy Research appeared insufficient to maintain the Airborne Laser Testbed aircraft, conduct flight experiments, and fund technology maturation of innovative directed energy concepts. This year, the budget request is less than last year’s, which only heightens my concern that MDA, and the scientists and engineers it leverages, lack the resources to make major advancements in this technology area.

“On a final note, I would like to thank Dr. Roberts and General O’Reilly for their participation in the committee’s ‘101’ briefings. These sessions have provided members with a greater understanding of the complex issues and programs within our subcommittee’s jurisdiction, and ultimately, they improve our ability to do effective oversight.

“Thank you again to all of our witnesses for their service and for being with us today. I look forward to your testimony.”

Why current ground systems fail

Ground based are more limited than space based

Ground based systems are hogging funding

Space based defense is a comparatively more valuable investment

Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 23-24

Although ground-based missile defense (GMD) is presumed to be the most feasible because it has been under continuous development for over half a century and receives far more money and attention than other options, it is also the most limited, especially when compared to the space-based systems discussed in this report. We are concerned that the growing costs of the GMD system will preclude sufficient funding and effort to develop, in a timely way, the more effective sea- and space-based boost-phase intercept systems. While the ground-based system receives almost an order of magnitude more funding, the sea-based system, which has an inherent global capability with ships currently deployed throughout the world, is proceeding at a funding-limited pace. This suggests the Missile Defense Agency has made a less than optimum assignment of priority, especially in light of the superior performance and potential capability of sea-based compared with ground-based missile defense. Although greater funding has gone into the ground-based than the sea-based systems, space-based missile defense has seen very little investment in recent years. Especially as we face greater cost constraints in the years ahead, it will be essential to gain maximum value from our missile defense investment. This argues for greater focus on space-based missile defenses because they have the greatest potential to meet emerging threats. Instead, we find ourselves today in a situation of having deployed first the least capable and cost-effective systems and only later developing systems that are potentially more capable and cost effective but which were “dumbed down” or even abandoned because they were prohibited by the ABM Treaty.3

Current missile defense plans are ineffective

DOD test data shows SM-3’s are incapable of destroying warhead

The test data shows attackers how to defeat the systems

Tested under ideal conditions to hide flaws

Lewis and Postol 10- George N. Lewis has a Ph.D. in experimental physics and is associate director of the Peace Studies Program at Cornell University. Theodore A. Postol is professor of science, technology, and national security policy at the Massachusetts Institute of Technology and a former scientific adviser to the chief of naval operations, May 2010, “A Flawed and Dangerous U.S. Missile Defense Plan”, Arms Control Today, http://people.reed.edu/~ahm/Courses/Reed-POL-358-2011-S1\_SWP/Syllabus/EReadings/10.2/10.2.LewisPostol2010A-Flawed.pdf

However, the Defense Department’s own test data show that, in combat, the vast majority of “successful” SM-3 experiments would have failed to destroy attacking warheads. The data also show potential adversaries how to defeat both the SM-3 and the GMD systems, which share the same serious flaws that can be readily exploited by adversaries. The long record of tests of the GMD system, and the most recent test in January of this year, shows that it has only been tested in carefully orchestrated scenarios that have been designed to hide fundamental flaws and produce appearances of success. The report provides no material facts or allusions to facts that indicate any technical advances that would counter the long record of orchestrated and dumbed-down missile defense tests.

The proof of these flaws is in the data that the Defense Department cites as evidence of the robustness of the GMD and SM-3 systems. That should be a strong warning to policymakers who believe that the missile defense systems promoted in the report will actually discourage future adversaries from pursuing ballistic missile programs.

## AT- Deterrence Now

Current Deterrence fails

there is a threat from rogue states/terrorist

the united states has been caught off guard in the past

AT- no attack from rogue actors, deterrence checks

-harder to identify and locate

- cant be identified for counter attack

-cant judge them because they are not out in open

- rogues have little to lose

- we don’t know their values/how to convince them not to attack

- lack communication

Frederick 9- Lt Col Lorinda A. Frederick, USAF, Master of Airpower Art and Science, School of Advanced Air and Space Studies, Air & Space Power Journal Fall 2009 – Volume XXIII, No. 3, No. AFRP 10-1, <http://www.airpower.au.af.mil/airchronicles/apj/apj09/fal09/frederick.html#frederick>

After the Cold War, deterring ballistic missile threats became more complicated due not only to the increasing numbers of nuclear-capable states but also to the rise of hostile rogue elements within a state as well as the proliferation of weapons of mass destruction (WMD), along with missile technology and expertise.6 According to joint doctrine, “the predominant threat is not from a competing superpower, but more likely from the deliberate launch of a ballistic missile from a ‘rogue state,’ failed state, or terrorist group.”7 Yet, the United States has difficulty tracking ballistic missiles due to the shortage of accurate and reliable intelligence, having “been surprised in the past by an opponent’s earlier-than-expected military technology, including the testing of the Soviet hydrogen bomb, the testing of missiles by Iraq and North Korea, and the acquisition of Chinese missiles by Saudi Arabia.”8 Consequently, the “proliferation of advanced technologies for missiles, guidance systems, and WMD warheads has increased the potential missile threat to the homeland” (emphasis in original).9 Today, the United States must attempt to deter both state and nonstate actors. Nonstate actors and rogue elements complicate deterrence for a number of reasons.10 First, rogue elements’ decision makers are harder to identify and locate, let alone deter, than their state counterparts. Without the ability to attribute the use of WMDs to a rogue-element actor, or even its state sponsor, the United States may have difficulty deterring an attack. Leaders of rogue elements and proliferators threaten US, regional, and global security interests because they defy international laws or norms of international behavior and use asymmetric means to attack law-abiding nations. Second, the fact that states operate more in the open allows the United States to gauge their perceptions, based on their actions: “The objective of deterrence is to convince potential adversaries that courses of action that threaten U.S. national interests will result in outcomes that are decisively worse than they could achieve through alternative courses of action.”11 Because rogue elements do not operate in the open, the United States cannot accurately gauge their perceptions of capability and will. Third, the United States cannot threaten to inflict substantial costs on rogue elements that have few high-value assets, minimal territorial claims, and small populations, compared to their state counterparts.12 An adversary’s hidden calculation of cost, benefits, and risks complicates the US approach to deterrence. Fourth, it may prove difficult to discern what is important to rogue elements. The United States could easily assume that they share its goals and values—but this is a dangerous assumption. Fifth, the United States has neither established nor exercised communication channels with rogue elements to the same extent that it has with state actors. Communication is a necessary component of deterrence strategy with regard to relaying the United States’ intent to respond to aggression. Even after receiving a clear message, rogue elements may not be deterred. BMD could help the United States deter aggression and respond should deterrence fail.

## AT- other countries would adapt

AT- other countries adapt

countries would find it too expensive

focus on countermeasures would mean hindering performance of current missiles

adapting for BMD reduces future missile performance

could make it easier for ground based missile defenses if there were an attack

SBMD could deny countries reasons for using missiles and prevent attack

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Responding to  Countermeasures Potential adversaries may develop countermeasures in response to the US fielding of an SBMD because the latter would make their capabilities ineffective. R&D of countermeasures, which takes time and money, may result in reduced payload and/or range of the missile. These monetary and performance costs may be enough to deter an adversary from attempting countermeasures. One countermeasure against nonkinetic SBMD capabilities—hardened missiles—could have a reduced payload due to the added weight of the hardening material and additional fuel needed to reach the required distances. The adversary could also field more missiles to saturate the missile defense architecture.49 The saturation point depends upon the numbers of both space-based and terrestrially based interceptors deployed. Because decoys and countermeasures are deployed after boost phase, SBMD could lighten the load for midcourse and terminal-phase defenses. The adversary could also shift from ballistic missiles to cruise missiles but would pay a penalty in terms of speed, reach, and destructive potential. These penalties, in combination with existing cruise missile defenses, could make an attack less likely to succeed. Space sensors designed to trigger SBMD could also trigger TMD to intercept cruise missiles. SBMD could increase the effectiveness of the current BMD architecture even if the adversary employs countermeasures. Credible capabilities have the potential to deny an adversary’s objectives and therefore may deter him from employing ballistic missiles altogether. Key political decisions help explain the progress (or lack thereof) made towards exploring and developing the potential of SBMD.

## Perception Solves Deterrence

no weapon is perfect, but still need to go forward

even imperfect BMD would deter adversaries(desert storm proves)

Frederick 9- Lt Col Lorinda A. Frederick, USAF, Master of Airpower Art and Science, School of Advanced Air and Space Studies, Air & Space Power Journal Fall 2009 – Volume XXIII, No. 3, No. AFRP 10-1, <http://www.airpower.au.af.mil/airchronicles/apj/apj09/fal09/frederick.html#frederick>

The United States may need to examine the standards it applies to the fielding of other BMD systems and adjust expectations for an initial SBMD capability. Henry Kissinger has commented on the standard of perfection applied to missile defense: The experts had all the technical arguments on their side, but Reagan had got hold of an elemental political truth: in a world of nuclear weapons, leaders who make no effort to protect their peoples against accident, mad opponents, nuclear proliferation, and a whole host of other foreseeable dangers, invite the opprobrium of posterity if disaster ever does occur. That it was not possible at the beginning of a complicated research program to demonstrate SDI’s maximum effectiveness was inherent in the complexity of the problem; no weapon would ever have been developed if it first had had to submit to so perfectionist a criterion.55 Fielding even imperfect elements of the architecture may deter an adversary, as occurred in Desert Storm when imperfect TMD helped keep Israel out of the war. The fact that senior leaders and policy makers tend to focus on current issues because they are more tangible puts the United States at risk of not funding research critical to its future defense. America may need to avoid pressures to sacrifice long-term research for the sake of short-term procurement by moving away from having policy determine the technologies pursued and letting feasible technologies inform policies necessary to deter threats.

Tech exists now

Better than in the 1990s

We are more developed now

Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 28

Although the Brilliant Pebbles program was terminated in the early 1990s, advances in the commercial, civil, and other defense sectors since that time would now permit even lighter mass, lower cost, and higher performance than would have been achieved by the 1990-era technology base. Thus, lighter weight and smarter components could now empower a Brilliant Pebbles interceptor with greater acceleration/ velocity, making possible boost-phase intercept of even short- and medium-range ballistic missiles as well as high-acceleration ICBMs, thus surpassing the capabilities of the 1990 Brilliant Pebbles.16

BP overview

No longer constrained by ABM

Cost and tech challenges are not main impediment

Tech already developed

Tech has advanced a lot since then

Built and deployed in 5 years at a cost of $5-10 billion

Wood et. Al 9- Drs. Lowell Wood, Ed English, Lyn Pleasance and Arno Ledebuhr who principals in conducting the Brilliant Pebbles and Clementine programs contributed in writing the appendix. Report chaired by Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Appendix I: The Legacy of Brilliant Pebbles, Clementine, and Iridium for Future Space-Based Missile Defenses”, in the report “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. I60

Since withdrawing from the Anti-Ballistic Missile (ABM) Treaty in 2002, the United States is no longer legally precluded from acquiring highly effective space-based interceptor defenses, moreover in a very short time-interval. The primary impediment to doing so arises from lack of political will, rather than diffcult or costly technical challenges. The needed technology was developed during the Reagan and Bush-41 administrations (1984-1992), was abandoned by the Clinton administration in 1993, and has not yet been revived. At best, there have been hints that the current administration may initiate a plan to begin a “space-based testbed” in a future administration, sometime in the next decade. Such plans often reflect a false view that space-based interceptor systems are much more complex and costly – or less “technically ready” – than ground-based defenses, which are the primary focus of ongoing missile defense programs. But that premise does not square with history, which should be reviewed from time to time to make clear that the choice for not giving the American people the benefits of space-based defenses is purely a political decision – made quite deliberately by the past two administrations, indicating the bipartisan nature of the political aversion to building effective space-based defenses.

Current missile defense programs are often traced to the Strategic Defense Initiative (SDI), launched by President Ronald Reagan in his March 23, 1983 speech and the Strategic Defense Initiative Organization (SDIO) formed in April 1984. But, while many SDI programs indeed have descendants in ongoing missile defense programs, notably missing since 1993 is any serious effort to consider space-based defenses, which were previously crucially important – literally, primal – to the overall layered defense architecture.1 In particular, as discussed below, space-based interceptors were easily the most innovative, most mature, cost-effective defense system to result from the $30 billion invested in the SDI during the Reagan and Bush-41 administrations.2 The following discussion briefly traces the evolution of space-based interceptors during the SDI era and relevant technology demonstrations through the mid-1990s, when all the needed technologies were demonstrated such that there can be little objective doubt of the SDI claims for spacebased interceptor systems. Since then, technology outside of Department of Defense (DoD) missile defense programs has advanced several generations, so great confidence can be placed in building and deploying a highly-effective spacebased defense within 5 years for $5-10 billion, as soon as it is politically correct to initiate such development.

Testing has been done already

Most components of BP have already been shown to work

Tests have been done to give insights and support for further development

Tested to be hard enough to deal with nuclear weapons

Other testing has already been done

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The Brilliant Pebbles Program conducted seven flight tests – three orbital and four sub-orbital ones – and developed an extensive capability for integrated system testing on the ground, including tethered flight-tests. Unfortunately, the last test of a highly optimized “pebble” that had passed all ground qualifications failed when the Minuteman launch vehicle had to be destroyed before releasing the pebble. The DoD decision to invest in the development programs of the two selected DemVal teams meant that the prototype hitto- kill vehicle would not be fully “battle” tested. Although these tests were not always completely successful, they provided an impressive data base to support the formal development process and provided many useful insights into key phenomena important to dealing with potential countermeasures and indeed to demonstrating latent unanticipated capabilities. For example, one intercept failure due to a faulty target warhead nevertheless demonstrated the pebbles’ unanticipated capability to track and close on a reentering warhead in the earth’s upper atmosphere. The program also participated in a major manner in three underground nuclear weaponry effects tests at the Nevada Test Site, validating the designed-in hardness against key nuclear weaponry effects of various pebbles components and technologies.9 Concurrent testing of pebbles components against other types of threats to its effectiveness – e.g., laser and microwave beams, “engineered space debris,” etc. – also took place at various specialized DoD test facilities.

BP tech is proven to work in space

BP sensors and computer system was used in Clementine mission

Clementine space-qualified BP tech except propulsion system

Astrid flight space-qualified propulsion

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Clementine’s implementation and mission-execution expressed a basic division of labor between the Naval Research Laboratory (NRL) and LLNL, where the Brilliant Pebbles concept originated. NRL built the Clementine spacecraft, integrating into it then-state-of-the-art technologies useful or essential for high-performance space-based interceptors. LLNL provided a version of the Brilliant Pebbles sensors and control computer system adapted for long-term use in the deep space environment and modified to accommodate the science goals of the Clementine mission. The figure above indicates the Clementine sensor suite was somewhat heavier than the Brilliant Pebbles sensor suite to accommodate different and to some degree more demanding conditions of the extended Clementine space mission.13 Though heavier than pebbles, the mass of the more extensive sensor suite still compares very favorably to the far lower-performance ones of the kill vehicles of current missile defense systems. Remarkably severe budgetary stringencies and the unprecedentedly fast pace of the Clementine mission compelled creation of spacecraft-controlling software throughout virtually all of the mission, with required software often delivered to the spacecraft mere days before its missioncritical use – another Clementine ‘first’. This unique “just in time” mode of software delivery worked spectacularly well for the first 7 months of the remarkably-complex mission, but resulted in a crucial failure after the main portion of the mission – the lunar mapping – had been completed, just before the asteroid ‘near-miss’ could be attempted. The Clementine spacecraft is presently in circumsolar orbit, and was operational when contacted most recently by the National Aeronautics and Space Administration’s NASA) Deep Space Network, more than a year after mission- termination. In recognition of its many unique features and singular accomplishments, Clementine’s flight back-up spacecraft is on permanent display in the Lunar Alcove of the National Air and Space Museum.14 Most notably, Clementine space-qualified all Brilliant Pebbles technology except for the light-weight miniature propulsion system – and that capability was demonstrated on an Astrid flight test in 1994.15

Astrid Demonstrated Pebbles Miniature Propulsion. The Astrid flight-test series employed a 21 kg fully fueled groundlaunched rocket using 3rd generation Brilliant Pebbles propulsion hardware. A lightweight titanium propellant tank formed the vehicle structure and a re-configured BP propulsion system was constructed to support the simultaneous thrusting of four axial thrusters. Fast liquid valves using warm pilot gas were used to control the four thrusters. The lightweight hardware shown above is similar to other key Brilliant Pebbles component masses shown on page i:62. This experiment used a four cylinder “quad” pump assembly with twice the number of pump cylinders used in the Brilliant Pebbles design. The final Astrid flight-test experiment successfully demonstrated all the key subsystems needed for a Brilliant Pebbles propulsion system. Warm gas thrusters and lightweight piston-tanks-as-structure had previously been tested separately,16 so this experiment validated that a boot-strapping, on-demand propulsion system was flight-feasible and performed according to expectations. This effort complemented prior development work that was carried out in rocket vendor test cells and at LLNL and represented an end-to-end validation of the miniaturized reciprocating pump concept. This Astrid vehicle is believed to be a world record-holder in flight-demonstrated change in velocity (∆v) for this size and mass. This flight experiment demonstrated the validity of the Brilliant Pebbles Divert and Attitude Control System (DACS) mass budget.

Iridium proves production works

Iridium launched 95 spacecrafts

Only 2 of 95 didn’t fail (good rate for space stuff)

Marginal cost was less than 10 million, less than what was thought

4 were made per week

Total cost was 5 billion over 5 years

Would need maybe 10 people to operate

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Nevertheless, these concerns were also laid to rest in the 1990s by a Motorola-led consortium, with its manufacture, launch-integration, launch, orbital deployment and subsequent operation of the Iridium worldwide satellite cellular telephony- supporting constellation. Iridium built and launched a constellation of 95 mid-sized (800 kg each – over 10 times more mass than the 50 kg pebble) spacecraft between May 1997 and November 1998, at a peak build-rate of 4 spacecraft- per-week, employing 19 launchers from a wide variety of American and foreign space-launch service-suppliers.18 Spacecraft quality has been operationally demonstrated to be exceptionally high – only 2 of the launched 95 failed in the first half-dozen years of operation, an in-service mortality rate unrivalled in mass-produced spacecraft of all types and origins. As illustrated on the previous page, the Iridium constellation provided world-wide coverage for communications via handheld cellphones and pagers.

The documented marginal unit cost of these spacecraft was less than $10 million, comparable to (though 50-percent higher than) the meticulously-prepared Bush-41 pebble cost-estimates on a “per-pound” basis (the actual perpound marginal cost of an Iridium satellite in 1997 was <$12 K/kg, and the projected per-pound marginal cost of a pebble in 1990 was ~$8 K/kg).19 Moreover, the peak build-rate of these much larger spacecraft was spacecraft-mass-comparable to that planned for Brilliant Pebbles by the Bush-41 DoD. The total cost for developing and deploying the 66-satellite operational constellation within a half-decade interval was about $5 billion, all paid for by the private investment community.

Quite importantly, the entire Iridium constellation, in full commercial operation, is operated by a ground-crew of fewer than ten people, implicitly validating the pebbles estimate of a required ground crew of the same magnitude – versus the thousands of personnel postulated by traditional rules-of-thumb.

Just as Clementine demonstrated that a first-of-a-kind, very high-performance deep space mission can be controlled by a mission control center crew of typically two people (in marked contrast to the many dozens of staff characteristic of NASA missions of comparable complexity), Iridium established that complex operations of large constellations of sophisticated spacecraft can be controlled, year-after-year through the present day, by a literal handful of staff supported by highly automated expert system control software.

Iridium, though an economic disaster for its initial investors, has been an outstanding technological success, and its current commercial operation is cash-flow-positive. Quite importantly in the present context, the creation and operation of Iridium has provided complete, essentially quantitative validation of several of the key economic, logistics and operational postulates of the Brilliant Pebbles ballistic missile defense architecture.

When combined with the legacy of Clementine and Astrid, Iridium demonstrates that there cannot be any rational controversy regarding any of the major technical issues to be addressed in building a cost-effective effective spacebased interceptor system.

Technological advances since BP was first conceived

Lightweight inertia units continue to be developed

Infrared sensors and coolers have improved

Digit systems have greatly improved

University in Britain has flown many systems similar to BP

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With applications mostly outside of the United States, lightweight inertial measurement unit (IMU) development has continued, infrared sensors and coolers have improved significantly and most importantly, digital electronic systems have improved by more than 100-fold, as Moore’s Law would indicate. The Danish company Terma offers a Wide Field of View Star Tracker. As discussed in Appendix B, the University of Surrey in Great Britain has been the leading proponent for lightweight space systems and has flown many lightweight systems using technology basically similar to and in some cases performance-comparable to the Brilliant Pebbles and Clementine technology-set. The People’ s Republic of China appears to have embraced the idea of lightweight, high performance space systems, with Surrey aid.

Pebble tech in current context

Key tech is better in a lot of ways

Pebble now would be smaller and perform better

Cost would be about $16 billion over the life cycle in 2006 dollars

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Brilliant Pebbles as specifically designed in 1990 couldn’t be reproduced these days, as many of the key technologies have so modernized that their 1990 versions are found only in technology museums. As would be expected from considering consumer-familiar features of the ongoing Silicon Revolution, such key pebbles technologies have become somewhat smaller, lower mass, less power-consumptive and less expensive over the 14-year interval since the pebbles design was ‘frozen’ by the Bush-41 DoD – but they typically express more than a hundred-fold improvement in performance. A modernized pebble thus would be somewhat smaller, lower-mass and less expensive than the ‘Government Pebble’ of a decade-and-a-half ago – and would offer far greater military performance in its sensing, data-processing, and communications sub-systems. The present- day total life-cycle cost of the Bush-41 pebbles GPALS missile defensive system, as then designed-and-operated, would be of the order of $16 billion (2006 dollars).

## Uniqueness

China gaining missiles-could stop our naval power

Fox 10 – Fox News, SciTech, “Chinese 'Carrier-Killer' Missile Could Reshape Sea Combat,” http://www.foxnews.com/scitech/2010/08/06/chinese-carrier-killer-missile-game-changer-expert-says/

China is developing an unprecedented new missile that is designed to be launched from land with enough accuracy to penetrate the defenses of even the most advanced moving aircraft carrier from a distance of more than 900 miles, sources say.

Initial reports on the new missile suggest it could reshape conflicts at sea, but U.S. weapons experts told FoxNews.com that it's no game-changer, nor a revolutionary threat to America's aircraft carriers -- which are the center of U.S. Pacific defense strategy.

"Some have called it a game-changer. I would dispute that claim," said Toshi Yoshihara, an associate professor at the U.S. Naval War College.

When complete, the Dong Feng 21D -- a version of which was displayed last year in a Chinese military parade -- would give China the ability to reach and hit U.S. aircraft carriers well before the U.S. can get close enough to the mainland to hit back.

A nuclear bomb could theoretically sink a carrier, too, assuming its sender was willing to raise the stakes to atomic levels. The conventionally armed DF 21D's uniqueness is its ability to hit a powerfully defended moving target with pinpoint precision.

"The emerging Chinese anti-ship missile capability, and in particular the DF 21D, represents the first post-Cold War capability that is both potentially capable of stopping our naval power projection -- and deliberately designed for that purpose," said Patrick Cronin, senior director of the Asia-Pacific Security Program at the nonpartisan, Washington-based Center for a New American Security.

Iran is getting missiles- multiple things prove

**Brownfield 6-10-11** – Mike Brownfield, Assistant Director of Strategic Communications at The Heritage Foundation, “Morning Bell: The Iranian Threat That Can’t Be Ignored,” http://blog.heritage.org/2011/06/10/morning-bell-the-iranian-threat-that-cant-be-ignored/

The leader of Iran, Mahmoud Ahmadinejad once said that Israel must be “wiped off the map.” And now Iran stands poised to have its finger on the trigger of a nuclear weapon, yet the Obama Administration continues to remain virtually silent on the nascent threat, all while the clouds amassing over the Iranian Peninsula are growing too dark to ignore.

Yesterday, following news that Iran plans to triple its output of higher-grade uranium, the United States, China, Russia, Britain, France and Germany issued a joint statement calling for Iran to provide more information about its nuclear intentions and that the country’s nuclear drive is causing “deep concern” to a number of world powers. Meanwhile, the United States issued sanctions on Iran’s police chief and three government entities it says are involved in the brutal repression of Iranian citizens.

But that’s just the tip of the iceberg.

Heritage’s James Phillips writes that Iran’s uranium enrichment program has increased by 84 percent since 2009, according to a new study by the Nonproliferation Policy Education Center, and author Greg Jones projects that Iran could produce enough weapons-grade uranium to fuel a nuclear weapon in about 62 days if it chose to do so.

According to unconfirmed reports, Iran’s Islamic Revolutionary Guard Corps has acquired two missile warheads capable of being armed with a nuclear weapon. And a recently leaked U.N. report described suspected ballistic missile technology exchanges between North Korea and Iran, with the technology transiting through an unnamed neighboring country, which several U.N. diplomats, under the condition of anonymity, have identified as China.

Apart from Iran’s pursuit of nuclear weapons, the country is also fomenting political unrest in the Middle East. Heritage’s Peter Brookes wrote in March of news that NATO forces in April seized 50 Iranian rockets destined for the Taliban in support of its expected spring offensive. The weapons could have been used to target U.S. and coalition forces as well as terror weapons against population centers.

Iran and Venezuela gaining missiles and building a base

**Walser 5-17-11** – Ray Walser, Senior Policy Analyst specializing in Latin America at The Heritage Foundation, “Chavez, Iran and Missiles: A Dangerous Step,” Heritage Foundation, http://blog.heritage.org/2011/05/17/chavez-iran-and-missiles-a-dangerous-step/

The Berlin-based daily Die Welt published a news story on May 13 citing “Western security sources” who reported that Venezuela’s authoritarian strongman Hugo Chavez secretly met in February 2011 with the chief of the Iranian Revolutionary Guard’s Air Force, Amir al-Hadschisadeh.

The pair, according to Die Welt, finalized the location for a missile base, said to be located on the Peninsula de Paraguana, a jut of land 120 kilometers from the Colombian border. Engineers from the Iranian state-owned construction agency Khatam al-Anbia, Die Welt added, have already begun preliminary work on the base.

Thus far there has been no response from the Obama Administration.

Chavez has long expressed interest in acquiring Russian-made missiles. He has purchased and showcased hundreds of shoulder-fired IGLA surface-to-air missiles and has been in the market for Russian S-300 missiles, the same powerful weapon that Russia has thus far denied to Iran. Chavez claims that U.S. aggression is his number one security threat.

More than one report on Iran’s missile intentions surfaced late last year. With the help of North Korea, Iran continues to extend its missile range capability and may now have weapons with sufficient capacity to reach the U.S. Add a nuclear weapon or WMD and one has a prescription for another Cuban missile crisis.

The central question that must be asked with increased urgency is: To what lengths will Chavez go to demonstrate the operational commitment of his alliance with Iran? Is this alliance one of rhetorical convenience filled with venom and bluster but little concrete action? Or is it an increasingly cooperative and operational venture that aims at accumulating military power, sharing resources (including access to uranium), and exploiting petroleum ties that will, as Chavez routinely promises, “hasten the end of U.S. imperialism”?

With an election year looming in 2012, with an increasingly active and united opposition gearing up for the campaign, and with Venezuela’s state-dominated, socialist economy in the doldrums, Chavez might seek more direct conformation with the U.S. as a political and strategic tool to consolidate his authoritarian grip on power.

Pakistan successfully tested nuke

The times of India 4-29-11 – Times of India, Pakistan, “Pakistan tests Hatf-8 cruist missile,” http://articles.timesofindia.indiatimes.com/2011-04-29/pakistan/29486845\_1\_cruise-missile-raad-conventional-warhead

Pakistan today successfully tested the nuclear-capable Hatf-VIII or Raad cruise missile which has a range of 350 kms, the military announced.

The indigenously developed low-flying stealth design missile, which can carry a nuclear or a conventional warhead, was tested at an undisclosed location.

The Inter-Services Public Relations said the test of the missile Raad was successful.The Raad, meaning thunder in Arabic, which was tested for the first time in August 2007, can be launched from combat aircraft.

Saudi Arabia could be moving towards a nuclear weapons program

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Saudi Arabia, which will undoubtedly find a nuclear weapons program a more attractive option if Iran achieves nuclear status and may already be pursuing a nuclear hedging strategy. Under an agreement signed during the October 2003 visit to Islamabad by Saudi Crown Prince Abdullah, Riyadh reportedly gained access to Pakistani nuclear technologies in exchange for stepped-up energy cooperation and improved strategic relations with Pak- istan.43 While Saudi Arabia has denied that it is devel- oping a nuclear weapons capability, it has been granted “small quantities protocol” status from the IAEA, which removes strict oversight of its nuclear reactor and could potentially facilitate the clandestine pursuit of nuclear weapons.44 Riyadh, meanwhile, was reported to be seek- ing modern replacements from China for its aging arse- nal of CSS-2 missiles originally purchased from China more than a generation ago.

**Egypt is very interested in WMD and ballistic missile tech and has been receiving it**

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Egypt, which is engaged in a clandestine effort to acquire WMD and ballistic missile technologies. Egypt has been a primary destination for North Korea’s ballistic missile exports and has received shipments of Scud B and C mis-siles, as well as No Dong missiles.40 Inspections by the IAEA have uncovered plutonium traces at Egyptian nu- clear facilities, increasing international concern about clandestine nuclear development efforts on the part of the Mubarak regime.41 The IAEA has also criticized Cairo for failing to declare certain nuclear materials and sites, one of which was a facility for separating plutonium that could be used in an atomic weapon.42

Syria showing interest in pursuing weapon capabilities

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Syria, which maintains biological and chemical weapons capabilities and possesses a large inventory of surface- to-surface ballistic missile systems, could deliver con- ventional and unconventional warheads to neighboring countries in the Middle East.35 Syria has also shown more than a passing interest in acquiring a nuclear weapons capability, as evidenced by the construction the Al-Kibar reactor site, which was subsequently destroyed by an Is- raeli Air Force strike in September 2007. The Central In- telligence Agency (CIA) has estimated that Damascus possesses hundreds of free-rocket-over-ground (FROG) missiles, Scud missiles, and SS-21 short-range ballistic missiles (SRBMs).36 Syria also maintains the indigenous capability to manufacture liquid-fuel Scuds.37 In Septem- ber 2003 testimony before the House of Representatives Subcommittee on the Middle East and South Asia, then- Under Secretary of State John Bolton outlined that Syria “is fully committed to expanding and improving its CW [chemical weapons] program” and “is continuing to de- velop an offensive biological weapons capability.”38 Syr- ia’s mobile missile force is capable of targeting much of Israel, as well as parts of Iraq, Jordan, and Turkey, and it has “developed a longer-range missile – the Scud-D – with assistance from North Korea” while simultane- ously pursuing “both solid- and liquid-propellant mis- sile programs.”39

Pakistan poses a threat- Developing missiles and allegiances to Al Qaeda

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Pakistan, which has had a nuclear capability at least since 1998 and has extensive ballistic and cruise missile pro- grams. Pakistan possessed as many as 100 nuclear war- heads and continues to upgrade its missile forces. The country has made major advances in missile technology, especially considering that it presently lacks the domestic science and technology base for developing such weap- ons, which suggests that it has been very successful in acquiring technologies from abroad. At the moment, Pak- istan’s longest-range ballistic missile is the Hatf-6, which has a range of 2,000 kilometers. At that range, the Hatf-6 is nearing the 2,500 kilometer threshold which the Rums- feld Commission indicated would mark the existence of the technical base necessary for the development of long- range missile systems.

While Pakistan’s nuclear arsenal and ballistic missiles are ostensibly intended to deter Indian aggression, Pakistan’s domestic political situation is so turbulent that there is no guarantee that these weapons will be used strictly for that purpose. For example, under a radicalized regime such missiles could be used against U.S. forces and mili- tary installations in Afghanistan and Iraq. Despite Paki- stan’s cooperation in the War on Terror, serious questions exist as to whether elements in the Pakistani security services, in particular the Directorate for Inter-Services Intelligence (ISI), are actively working against U.S. inter- ests by supporting Afghan and Pakistani Taliban fighters in the Pakistani tribal areas. The fact that such powerful elements could be operating outside official Pakistani policy channels is frightening, even though ISI does not directly supervise the nuclear arsenal. Pakistan’s nuclear forces are overseen by the National Command Author-ity (NCA), and underwent a thorough security upgrade in 2003. Nevertheless, concerns remain about the com- mand and control of Pakistan’s nuclear forces. Particu- larly troubling is the level of sympathy for al-Qaeda and the Taliban within the junior and mid-level cadres of the Pakistani military as a result of fighting side-by-side with Islamists against Indian forces in Jammu and Kashmir. It is precisely these officers who are most likely to be pro- moted to sensitive positions in the years ahead.

North Korea developing nuke weapons/risks proliferating

Panda 5-19-11 – Ranjaram Panda, Senior Fellow at the Institute for Defence Studies and Analyses, New Delhi, “North Korea and Iran Partner in Ballistic Missiles Trade,” IDSA Comment, http://www.idsa.in/idsacomments/NorthKoreaandIranPartnerinBallisticMissilesTrade\_RajaramPanda\_190511

Despite China’s support to the North, it seems clear that the potential for Pyongyang to provide weapon-usable nuclear substances or atomic equipment to foreign nations continues to be a worry and poses “new challenges to international non-proliferation efforts”. Besides the US, Israel and other nations have also accused North Korea of illicitly aiding Syria in building an atomic reactor that was demolished in a 2007 Israeli air strike. The International Atomic Energy Agency is probing this matter. There is enough evidence to suggest that Pyongyang’s uranium enrichment programme is “primarily for military purposes”. If peace is to prevail in East Asia, Pyongyang must abandon its uranium enrichment programme and all aspects of its nuclear programme should be placed under international monitoring. How to check Pyongyang from being a proliferator remains a huge challenge for the international community.

Iran gaining missiles/potentially working with North Korea

Panda 5-19-11 – Ranjaram Panda, Senior Fellow at the Institute for Defence Studies and Analyses, New Delhi, “North Korea and Iran Partner in Ballistic Missiles Trade,” IDSA Comment, http://www.idsa.in/idsacomments/NorthKoreaandIranPartnerinBallisticMissilesTrade\_RajaramPanda\_190511

Meanwhile, the response from Iran, as expected, was of denial. It rejected charges of missile cooperation with North Korea. Slamming the expert panel’s findings as “fabrications”, Iran’s Foreign Ministry spokesman Ramin Mehmanparast argued that Iran’s own missile capabilities are so advanced that it does not need outside help. He said: “Iran’s (missile) technology and capability are advanced enough that we don’t need other countries to provide us technology or components. …We have repeatedly rejected reports on the exchange of ballistic missile technology or parts with any country.” However, an independent assessment made by the US intelligence analysts suggests that Russia has also supported entities in China and North Korea to help Iran move towards self-sufficiency in the production of ballistic missiles. Indeed, Tehran’s collaboration with Pyongyang on missile development was evident during an October 2010 North Korean military parade which showcased a new Nodong missile warhead. The warhead possessed “a strong design similarity with the Iranian Shahab 3 triconic warhead.”

North Korea making missile gains

Panda 5-19-11 – Ranjaram Panda, Senior Fellow at the Institute for Defence Studies and Analyses, New Delhi, “North Korea and Iran Partner in Ballistic Missiles Trade,” IDSA Comment, http://www.idsa.in/idsacomments/NorthKoreaandIranPartnerinBallisticMissilesTrade\_RajaramPanda\_190511

North Korea’s activities over the past year suggest that it has made substantial progress in its nuclear-weapons programme, including the establishment of a new uranium enrichment plant and work on a light-water reactor. At the same time, as the report mentions, North Korea has “continued to defy the bans on imports and exports of nuclear-related items, of conventional arms and of luxury goods.” The UNSC sanctions have been ineffective in preventing North Korea’s nuclear development and weapons sales, though “they have made it more difficult and expensive for the country to pursue these.”

There are many gaps and weaknesses in international transportation and cargo regimes and Pyongyang has taken advantage of these shortcomings to transport its weapons to customers. Indeed, Pyongyang has specialised in setting up fraudulent firms and offshore banking operations, and has been employing people with fake names to cloak the identities of blacklisted firms and officials to undertake its illegal operations. For example, the expert panel report found that the sanctioned Korea Mining Development Trading Corp. has four fake names identified by the UN sanctions committee as well as 12 other identities that were not designated.

In November 2010, North Korea allowed the US nuclear weapons expert, Siegfried Hecker, to view the approximately 2,000 uranium enrichment centrifuges at its previously secret facility. Hecker and many other specialists assert that “it is highly likely” that there are other uranium enrichment-related plants in North Korea that have not been revealed. In May 2011, the US special envoy to North Korea, Stephen Bosworth, was dispatched to Seoul for talks with the South Korean officials on North Korea’s requests for food assistance as well as respite from the current nuclear impasse. Though Bosworth did not comment on the expert panel report, he condemned North Korea’s uranium programme.

North Korea isn’t yet must be addressed

Bolton 7-14-11 – John R. Bolton, a former U.S. ambassador to the United Nations, is a senior fellow at the American Enterprise Institute, “North Korea edges toward next nuke test,” http://www.washingtontimes.com/news/2011/jul/14/north-korea-edges-toward-next-nuke-test/

A real strategy, which we need much sooner than later, would require understanding that the DPRK and Iranian threats, including cyberwarfare, are two sides of the same coin, not unrelated outbreaks of nuclear contagion. The United States must take both seriously, reversing our present course of ignoring both.

Waiting passively for a third DPRK nuclear test is unacceptable, although that might be the only event to motivate Mr. Obama to pay at least lip service to combating Pyongyang’s continuing threat. By removing the public spotlight from the North - and its customers and suppliers - his administration has made it easier to evade existing sanctions and harder to impose new constraints absent another attention-riveting underground test. Moreover, Seoul is keenly aware of the North’s impending succession crisis and is likely prepared to take a much tougher line than in recent years.

At a minimum, therefore, we must press China and Russia far harder to quarantine North Korea’s trafficking in nuclear and missile technologies and materials. Unfortunately, the administration’s startling passivity means missing opportunities, which we will all regret very soon.

North Korean missile development now- leaked UN report

Panda 5-19-11 – Ranjaram Panda, Senior Fellow at the Institute for Defence Studies and Analyses, New Delhi, “North Korea and Iran Partner in Ballistic Missiles Trade,” IDSA Comment, http://www.idsa.in/idsacomments/NorthKoreaandIranPartnerinBallisticMissilesTrade\_RajaramPanda\_190511

North Korea and Iran have been allegedly involved in ballistic missiles trade for a while. An 81-page report by the UN panel of experts, submitted to the Security Council on May 13, 2011, has established that North Korea has persisted in attempting to export ballistic missiles, missile components and relevant technologies to Iran. The report also suggests that North Korea has finished or nearly finished a second launch complex for long-range missiles along its west coast. It may be recalled that North Korea began a ballistic missile programme in the 1970s and test-launched its first ballistic missile in the 1990s. It transpires now that the Dongchang-ri complex’s facilities may be “bigger and more sophisticated” than the first missile launch installation at Musudan-ri.

North Korea gaining missile capabilities in the status quo, your authors don’t assume this because Obama has been silent

Bolton 7-14-11 – John R. Bolton, a former U.S. ambassador to the United Nations, is a senior fellow at the American Enterprise Institute, “North Korea edges toward next nuke test,” http://www.washingtontimes.com/news/2011/jul/14/north-korea-edges-toward-next-nuke-test/

You wouldn’t know it from the Obama administration, but North Korea’s global threat continues to metastasize. South Korea recently concluded that extensive cyber-attacks against civilian and military targets in the South emanated from the Democratic People’s Republic of Korea (DPRK). Following China’s lead in information warfare, the North is creating yet another asymmetric military capability it can deploy against its adversaries and also peddle for hard currency to other rogue states and terrorists.

Although Pyongyang limited its targeting of this particular sortie to South Korea, the potential cyberwarfare battlefield is global and includes the United States, which already is the subject of extensive cyberprobing, exploitation and espionage by China. For a country perennially on the brink of starvation, North Korea’s military foray into cyberspace demonstrates its continuing malevolence.

The DPRK’s nuclear-weapons program has not rested on its laurels, either, with widely observed surface-level preparations for a possible third underground test well under way.

The North’s development of ballistic missiles capable of delivering nuclear payloads is also advancing apace, as Russian missile designer Yuri Solomonov highlighted last month in a Kommersant interview. This is hardly surprisingly given Iran’s increasing long-range capabilities, the extensive Tehran-Pyongyang collaboration, and their programs’ common base in Soviet-era Scud missile technology.

Meanwhile, Pakistan’s A.Q. Khan has released documents purportedly showing prior North Korean bribery of senior Islamabad officials to grease the transfer of nuclear or ballistic-missile technology. While their authenticity is disputed, the documents are part of Mr. Khan’s continuing campaign to prove he did not act solo in the world’s illicit nuclear-weapons bazaar.

He long ago admitted supplying North Korea and Iran with critical nuclear technology. Pyongyang’s unveiling in November of impressive new uranium-enrichment facilities at Yongbyon and recent construction there show the continuing fruits of Mr. Khan’s entrepreneurship. His documents - and the many others he undoubtedly has in a shoebox somewhere - are worth verifying and actually might help Islamabad and Washington work together to repair their fractured relationship and prevent China from exploiting their current differences.

Clearly, North Korea’s weapons programs are not decelerating even amid intensive preparations for a possible transition of power, following Kim Jong-il’s death, to a third member of the communist Kim dynasty. But faced with these challenges, the Obama administration has been not only publicly silent but essentially passive both diplomatically and intellectually. Only the Pentagon and the intelligence community, fortunately still implementing the Proliferation Security Initiative, have done much beyond noting pro forma that the troublemaking DPRK is still at it.

Iran’s missile program is a threat- recent developments

**DAREINI 6-2-11** – Ali Akbar Dareini, Associate Press for Yahoo Games, “Iran: Missile progress shows sanctions futile,” http://news.yahoo.com/iran-missile-progress-shows-sanctions-futile-162422024.html

Iran's defense minister claimed Saturday that the country's missile progress shows that U.N. sanctions are ineffective and won't stop Tehran's defense programs.

The statement by Gen. Ahmad Vahidi comes during 10 days of war games in Iran's latest show of military might and displays what Tehran claims is growing self-sufficiency in military and other technologies.

Vahidi said Iran's missile program is "indigenous" and has no reliance on foreign countries to meet its defense requirements. Iran is under four sets of U.N. sanctions over its refusal to halt uranium enrichment, a technology that can be used to produce nuclear fuel or atomic weapons.

Last week, Iran unveiled underground missile silos for the first time, making Iran's arsenal less vulnerable to any possible attack.

Iran's Revolutionary Guard, the country's most powerful military force, said the Islamic Republic has the ability to produce missiles with a greater range than those currently in its arsenal, but doesn't need to do so.

The upgraded version of Iran's Shahab-3 and Sajjil-2 missiles already can travel up to 1,240 miles (2,000 kilometers) — putting Israel, U.S. bases in the Gulf region and parts Europe within reach.

"The war games ... show Iran's great capability in designing, producing and using various kinds of missiles based on domestic knowledge. This showed that the sanctions imposed had no effect on Iran's missile program," Vahidi said in comments posted on sepahnews.com, the Guard's official website.

Iran has periodically boasted of what it calls homegrown advances in technological sectors such as its satellite program and other scientific work.

Status quo threats harder to respond to than previous threats

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Misile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

Twenty-first century threats to the United States, its de- ployed forces, and its friends and allies differ fundamental- ly from those of the Cold War. An unprecedented number of international actors have now acquired – or are seeking to acquire – missiles. These include not only states, but also non-state groups interested in obtaining missiles with nucle- ar or other payloads. The spectrum encompasses the missile arsenals already in the hands of Russia and China, as well as the emerging arsenals of a number of hostile states.

The character of this threat has also changed. Unlike the Soviet Union, these newer missile possessors do not attempt to match U.S. systems, either in quality or in quantity. In- stead, their missiles are designed to inflict major devasta- tion without necessarily possessing the accuracy associated with the U.S. and Soviet nuclear arsenals of the Cold War.1

The warning time that the United States might have be- fore the deployment of such capabilities by a hostile state, or even a terrorist actor, is eroding as a result of several fac- tors, including the continued proliferation and widespread availability of technologies to build missiles and the result- ing possibility that an entire system might be purchased out- right. Would-be possessors do not have to engage in the pro- tracted process of designing and building a missile. They could purchase and assemble components, reverse-engineer a missile after having purchased a prototype, or immediately acquire a number of assembled missiles. Even missiles that are primitive by U.S. standards might suffice for a rogue state or terrorist organization seeking to inflict extensive damage upon the United States. As the Rumsfeld Commission point- ed out in its 1998 report:

Under some plausible scenarios – including re-bas- ing or transfer of operational missiles, sea- and air- launch options, and shortened development pro- grams that might include testing in a third country – or some combination of these – the United States might well have little or no warning before opera- tional deployment.2

North Korea and Iran are trading BMT

BBC 5-14-11 – BBC News, “North Korea and Iran sharing ballistic missile technology,” Asia-Pacific, http://www.bbc.co.uk/news/world-asia-pacific-13402590

North Korea and Iran appear to have been exchanging ballistic missile technology in violation of sanctions, a leaked UN report shows. The report, obtained by Reuters, said regular transfers had been taking place through "a neighbouring third country", named by diplomats as China.

The sanctions were imposed on Pyongyang by the UN after it conducted a series of nuclear tests in 2006 and 2009. They ban all trade in nuclear and missile technology with North Korea.

They also imposed an arms embargo and subjected some North Korean individuals to travel bans and assets freezes. North Korea has twice tested nuclear devices and said in September last year that it had entered the final phase of uranium enrichment.

The country is believed to have enough plutonium to make about six bombs, but is not thought to have developed a ballistic missile capable of carrying a nuclear warhead.

The report was written by a UN panel of experts monitoring Pyongyang's compliance with the sanctions. It said that "prohibited ballistic missile-related items are suspected to have been transferred between the Democratic People's Republic of Korea [North Korea] and the Islamic Republic of Iran", using regular scheduled flights on national carriers Air Koryo and Iran Air.

For arms and related material, "whose illicit nature would become apparent on any cursory physical inspection", Pyongyang appeared to prefer the use of chartered cargo flights, Reuters quoted it as saying. The flights would travel "from or to air cargo hubs which lack the kind of monitoring and security to which passenger terminals and flights are now subject".

This presented "new challenges to international non-proliferation efforts", said the panel.

Iran secretly tested ballistic missiles

Phillips 6-30-11 – James Phillips, Senior Research Fellow for Middle Eastern Affairs at the Douglas and Sarah Allison Center for Foreign Policy Studies at The Heritage Foundation, “Iran’s Missile Tests Amplify Nuclear Alarm Bells,” The Foundry

Iran secretly has tested ballistic missiles that are capable of carrying a nuclear warhead in violation of U.N. Security Council resolutions, British Foreign Secretary William Hague warned yesterday. Britain believes Iran conducted at least three secret tests of medium-range missiles since October, more evidence of Iran’s accelerating missile buildup. Hague’s statement came the day after Iran’s Islamic Revolutionary Guard Corps claimed to have launched 14 missiles as part of the ongoing “Great Prophet 6,” 10 days of military exercises designed to showcase the Islamic Republic’s growing military strength.

Hague also expressed alarm at Iran’s plans to triple its capacity to enrich uranium to 20 percent, a higher level than is needed for civilian nuclear power. Tehran claims that it needs such highly enriched uranium to fuel its research reactor, but has no known means of transforming such uranium into fuel rods suitable for fueling the reactor. It is particularly suspicious that these uranium enrichment operations will take place inside a fortified mountain base near Qum—discovered by Western intelligence agencies in 2009 after it was covertly built without informing the International Atomic Energy Agency, a violation of Iran’s nuclear proliferation commitments. By enriching uranium to 20 percent, Iran will position itself for a much faster nuclear breakout, as it is much easier to enrich to the 90 percent level needed for nuclear weapons from uranium already enriched to 20 percent than from the 3 percent level used in most civilian nuclear reactors.

Obama continues to downplay Iran’s missile capabilities despite recent advancements

Phillips 6-30-11 – James Phillips, Senior Research Fellow for Middle Eastern Affairs at the Douglas and Sarah Allison Center for Foreign Policy Studies at The Heritage Foundation, “Iran’s Missile Tests Amplify Nuclear Alarm Bells,” The Foundry

Iran also unveiled several new missile silos on Monday, and yesterday it claimed to have built a new long-range radar system capable of monitoring low-flying satellites. If true, such a radar system might enable the Revolutionary Guards to better conceal their nuclear and ballistic missile activities from Western intelligence satellites by giving them advance notice of when such satellites were due to pass over sensitive areas.

One of Iran’s most potentially dangerous new missiles is the Khalije Fars (“Persian Gulf”) anti-ship missile, which reportedly is a solid-fuel missile capable of hitting ships up to 350 kilometers away. Combined with airborne surveillance aircraft that could provide targeting data, this missile could pose a threat to U.S. aircraft carriers and other warships. One of the foremost experts on Iran’s ballistic missile arsenal, Uzi Rubin, considers that such a missile capability could be “a game-changer” in the event of hostilities in the Persian Gulf between Iran and the United States.

Meanwhile, the Obama Administration continues to downplay Iran’s progress on the ballistic missile and nuclear fronts. It maintains that international sanctions have slowed the momentum of Iran’s military buildup, despite mounting contradictory evidence.

BM threats are rising and adversaries can provide countermeasures

Lambakis 7 – Steven Lambakis, pHd, national security and international affairs analyst specializing in space power and policy studies for National Institute for Public policy, March 2007, “Leveraging Space to Improve Missile Defense” High Frontier, The Journal for Space & Missile professionals, Volume 3, Number 2

The adversaries of the US are looking hard at ballistic missiles because they represent a challenging threat. An intercontinental ballistic missile (ICBM) can travel at extremely high speeds—at times more than 15,000 mph. Kinetic energy interceptors collide with targets in space thousands of miles away at closing speeds that can exceed 25,000 mph. Besides hurling very small objects through air and space at very high speeds, ballistic missiles can be launched from anywhere at any time from multiple directions, to anywhere on the globe. Adding to this challenge, we can ex- pect adversaries to employ countermeasures to foil missile de- fense calculations and disrupt system operations.

With intercontinental flight times measured in minutes, ballis- tic missiles are the surest and fastest way to destroy a distant city or military asset. They can give a state regional or even global prestige and are a potentially significant military weapon and tool of terror, especially if those missiles are married to weapons of mass destruction. Longer-range systems would give hostile rogue states a capability to vault over the oceans to strike Ameri- can cities and blackmail US leaders.

In the future, we may face adversaries unknown to us today, fight in unexpected regions, or have to defend against new types of ballistic missiles and countermeasures. The significance of this uncertainty for missile defense planners is enormous. This means that we cannot be totally focused on “who” poses the threat today because the “who” can change with a political de- cision or by a surprise shift in capabilities from one region to another. Similarly, a focus on the “how” does not mean we can ignore today’s enemies or their present-day capabilities. On the contrary, today’s ballistic missile threats continue to drive our Nation’s near-term missile defense fielding and long-term development efforts. Today’s threats provide “ground truth,” a measure of what is possible today and, therefore, a low-end representation of what we must be prepared to defeat tomorrow. The “high end” represents ballistic missile threats that today are either unrealized or unknown but yet are possible to develop.

There has been steady interest and investment of scarce re- sources by some 20 to 30 countries in acquiring ballistic missiles and improving payload destructive power, warhead accuracy, and delivery range. Turnkey missile systems have been trans- ferred from one state to another and may one day be purchased by terrorists. So why must we pay attention? Because a missile strike involving nuclear, biological, or chemical weapons could wreak catastrophic damage, far surpassing the levels of destruc- tion, economic dislocation, and terror produced by the 11 Sep- tember 2001 attacks.

Adversaries and Rogue states are gaining missiles in the status quo

Lambakis 7 – Steven Lambakis, pHd, national security and international affairs analyst specializing in space power and policy studies for National Institute for Public policy, March 2007, “Leveraging Space to Improve Missile Defense” High Frontier, The Journal for Space & Missile professionals, Volume 3, Number 2

The international web of trading relationships in ballistic mis- siles and related technologies is extensive. Short-range ballistic missile systems are plentiful and available for sale on the in- ternational black market. Equally worrisome is the heightened interest in longer-range systems. For example, North Korea is developing an improved performance intermediate-range ballis- tic missile that can travel about 3,200 km. North Korea also has an intense development program to produce an ICBM. The Taepo Dong-2 ICBM may have a two-stage variant (and travel around 10,000 km) and a three-stage variant (15,000 km). The 4 July 2006 test of the Taepo Dong-2 failed moments after lift-off, demonstrating that the North Koreans have more work to do. There is every indication, however, they will continue to strive for a viable long-range strike capability in addition to producing and selling shorter-range systems that may be used to threaten its neighbors, such as Japan.

Iran also has a significant ballistic missile development pro- gram. Besides its numerous short-range systems, Iran is devel- oping a medium-range ballistic missile (Shahab-3) based on North Korean No Dong technology. In its quest for longer reach, Iran is developing an extended range Shahab-3 (which can travel 1,300 km and threaten Israel) and a new medium-range system (which may travel 2,000 km and reach into portions of Europe). In November 2006, Iran showcased on television several ballis- tic missile launches, to include the Shahab-3, demonstrating for the world the importance Tehran places on its ballistic missile development program. Iran is believed to be working on inter- continental range ballistic missiles, which may be in its arsenal by 2015, that is if it does not import longer-range systems from proliferators like North Korea earlier than that.

Countries like China and Russia have done considerable work on ballistic missile and countermeasure technologies.4

Having developed and deployed advanced ballistic missiles of all ranges and done extensive research on nuclear weapons, we are right- fully concerned, not only about the tremendous and devastating offensive potential of these foreign ballistic missile forces, but also about the willingness of these two governments to prolifer- ate ballistic missile technologies abroad and sell their expertise to other countries.

In other words, there are significant technological and politi- cal uncertainties to weigh as we consider how to proceed with the development of US missile defenses. How China and Russia will play in the use and proliferation of ballistic missiles is no small part of this consideration. How will our adversaries fight today and tomorrow and with what capabilities? How can we technologically and operationally defend ourselves against an array of ballistic missile threats? The truth is, we cannot know for certain, so we must be ready for many contingencies.

\*\*\*Aerospace\*\*\*

## K2 Econ

Aerospace industry key to the economy

DOLETA 5 ( “America's Aerospace Industry: Identifying and Addressing Workforce Challenges” May 2005 www.doleta.gov/brg/indprof/aerospace\_report.pdf)

The aerospace industry was identified as one of the high growth industries because the industry is critical to the national and economic security of our nation. Aerospace has played a vital and exciting role in the growth of the United States and the nation's future is bright with the vast potential these two components, air and space, offer. General data provided by the Bureau of Labor Statistics (BLS) indicates that aerospace engineers and related professions will decline between 2002 and 2012. However, the events of September 11, 2001 have magnified the aerospace industry's importance to the national and economic security of our nation, and economic trends show the workforce picture is beginning to turn around. Other sectors of the economy depend on aerospace businesses and related disciplines for technical skills and technologies that are critical elements of our security infrastructure and improve America's position in the global marketplace. The diverse sectors of aerospace include commercial, civil and military aviation, space, and defense. They encompass a wide array of talent and competencies. The industrial base includes researchers, engineers, technicians, mechanics, skilled machinists, and precision production jobs. According to the Aerospace Industry Association, the aerospace industry, including its supplier network and the economic impact of products, totaled nearly $900 billion in sales and accounts for one in seven U.S. jobs. Even with aerospace employment at its lowest level since the great depression, the industry accounts for four percent of the U.S. manufacturing workforce. This key industry is facing a critical human capital crisis.

The Aerospace sector is key to the economy

DOLETA 5 ( “America's Aerospace Industry: Identifying and Addressing Workforce Challenges” May 2005 www.doleta.gov/brg/indprof/aerospace\_report.pdf)

The aerospace industry was selected for the President's High Growth Job Training Initiative in large part because of its significant impact on the economy overall, as well as its impact on the growth of other industries. The President established a Commission on the Future of the United States Aerospace Industry to call attention to how the "critical underpinnings of this nation's aerospace industiy are showing signs of faltering—and to raise the alarm." The aerospace industry is a powerful force within the U.S. economy and one of the nation's most competitive industries in the global marketplace. It contributes over 15 percent to our Gross Domestic Product and supports over 15 million high-quality American jobs. Aerospace products provide the largest trade surplus of any manufacturing sector. Last year, more than 600 million passengers relied on U.S. commercial air transportation and over 150 million people were transported on general aviation aircraft. Over 40 percent of the value of U.S. freight is transported by air. Aerospace capabilities have enabled e-commerce to flourish with overnight mail and parcel delivery, and just-in-time manufacturing.

Every dollar invested in Aerospace boosts the economy by a factor of 3

AIAA 10 (“Aerospace and Defense: The Strength to Lift America” September 2010 Aerospace Industries Association of America www.nationalaerospaceweek.org/wp-content/.../04/whitepaper.pdf)

Every dollar invested in the aerospace industry has a triple effect. It helps retain good jobs in the United States; creates the products that bring significant revenues from other countries and provides security and economic benefits that flow uniquely from America's civil aviation, defense and space defense leadership. The aerospace and defense industry takes great pride in contributing to our nation's success, and, with the appropriate policies and resources will remain a source of economic strength for generations to come.

## K2 Competitiveness

**Aerospace industry is key to competitiveness**

Chesebro 6/16/11—Johnathan Chesebro, an International Trade Specialist for Manufacturing and Services within the International Trade Administration, and a member of the Aerospace Team that focuses on analysis and promotion of the aerospace industry, “U.S. Aerospace Industry Goes Big at the 2011 Paris Air Show” June 16, 2011, online: http://blog.trade.gov/2011/06/16/u-s-aerospace-industry-goes-big-at-the-2011-paris-air-show/

The U.S. aerospace industry is internationally competitive and is the largest in the world. The industry includes the manufacturing of civil and military aircraft, missiles, space vehicles, and parts of all of the foregoing. Despite the lingering effects of the global economic downturn, the industry continued to show reasonable strength in 2010, contributing $78 billion in export sales to the U.S. economy. The industry’s positive trade balance of $44 billion is the largest trade surplus of any manufacturing industry and came from exporting 42 percent of all aerospace production and 72 percent of civil aircraft and component production. According to a 2008 study by the U.S. Department of Commerce, aerospace supports more jobs through exports than any other industry. The U.S. aerospace industry directly supports about 430,000 jobs and indirectly supports more than 700,000 additional jobs. In addition, U.S. aerospace workers are well-paid, earning 47 percent more than manufacturing workers generally Foreign firms are attracted to the U.S. aerospace market because it is the largest in the world and has a skilled workforce, extensive distribution systems, diverse products, and strong support at the local and national level for policy and promotion. Industry estimates indicate that the annual increase in the number of large commercial airplanes added to the worldwide fleet over the next 20 years will be 3.2 percent per year for a total of 30,900 valued at $3.6 trillion at list prices.

The Aerospace sector is key to heg and competitiveness

Defense Industry Daily 5 (“ US Congress Attempts to Boost Future Aerospace Workforcehttp” 10/28/05 http://www.defenseindustrydaily.com/us-congress-attempts-to-boost-future-aerospace-workforce-01405/)

As the aerospace industry supports over 11 million American jobs and generates 15 percent of our gross domestic product, the strength and vitality of this sector of our economy is absolutely vital**…. If we are to remain competitive** in this field, we must, and I agree with both the gentleman from Michigan and from Texas, we must produce highly trained workers that can compete with workers overseas. Additionally, this legislation also mandates a coordinated effort to improve science and math education in the United States. Providing a strong education in math and science is absolutely vital and would not only aid the aerospace industry, but also will go a long way to ensuring a prosperous future for our country. I am proud to support this legislation. I am also proud of the fact that Boeing Industries is in my congressional district. Rep. Tauscher [D-CA] noted: “Over the last 15 years, the aerospace industry has lost hundreds of thousands of jobs, many of them in my home state of California. Many of these losses are cyclical and linked to the ebb and flow of defense spending. Many of them, however, are due to self-inflicted injuries such as a lack of clear federal policy and direction and badly outdated export control systems that make no distinction between cutting-edge and readily available technology.” In a recent report to the President, the bipartisan Commission on the Future of the United States Aerospace Industry recommended the establishment of multi-agency strategy panel to counter “the nation’s apathy toward developing a technologically trained workforce.” The Commission warned that this apathy could lead to “intellectual and **industrial disarmament” and pose a “direct threat to our nation’s capability to continue as a world leader.”**

## SMD k2 Heg

Space weapons strengthen all pillars of hegemony

Dolman 6—Everett Dolman, PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies “US Military Transformation and Weapons in

Space” 2006, Pg 21-22

Weapons in Space and Hegemonic War And America would respond ... finally. But would another state? I have already pointed out that if America were to weaponize space today, it is unlikely that any other state or group of states would find it rational to counter it in kind. The fact is that should the US develop and deploy weapons in outer space it would represent the addition of a potent new military capacity that would assist in extending the period of American hegemony well into the future. This would clearly be threatening, and America must expect severe condemnation and increased competition in peripheral areas. But such an outcome is still less threatening than any other state doing so, for two essential reasons. First, no other state can currently compete with the US in military space. The entry cost to provide the infrastructure necessary is too high; hundreds of billions of dollars, at minimum. The years of investment it would take to achieve a minimal counter-force capability—essentially from scratch—would provide more than ample time for the US to entrench itself in space, and readily counter preliminary efforts to displace it. The tremendous effort in time and resources would be worse than wasted. Most states, if not all, would therefore opt not to counter US deployments in kind. They might oppose US interests with asymmetric balancing, depending on how aggressively America uses its new power, but the likelihood of a hemorrhaging arms race in space should the US deploy weapons there -at least for the next few years—is extremely remote. Second, placement of weapons in space by the United States would be perceived as an attempt at continuing its current military dominance on land, at sea, and in the air. **It would enhance military power across the board, and would extend the current period of American hegemony** beyond what it would be without space weaponization. Although there is clear opposition to the current international balance of power, the status quo, there is also a sense that it is at least tolerable to the majority of states. A continuation of it is thus minimally acceptable, even to states working towards its demise. So long as the US does not employ its power arbitrarily (and I have argued that space weapons are structurally far less likely to be used in such a manner, and is at least less threatening, than an increase in current capabilities), the situation would be bearable initially and grudgingly accepted over time. On the other hand, an attempt by any other state to dominate space would rightly be perceived as an effort to break the land-sea-air dominance of the United States in preparation for a new international order. The action would be a challenge to the status quo, not a perpetuation of it. Such an event would be disconcerting to the nations that accept the current international order (including the venerable institutions of trade, finance, and law that operate within it) and intolerable to the US. As leader of the current system, the US would enact an immediate counter-space effort. As current hegemon, the US could do no less, save graciously decide to step aside. Because all states are not equal in power or interest, no state other than the US would, or could, publicly proclaim its intent to dominate space without setting off an immediate scramble ... at least for the time being.

## SMD k2 Tech

**Space weapons enhance US tech superiority in the short term**

Ruyssenaars 10—Hank Ruyssenaars, AP journalist and space correspondent, “U.S. AIR FORCE MILITARIZING: SPACE 'PEARL HARBOR' NEXT?” online: http://forpressfound.livejournal.com/37871.html

The implications of space militarization are enormous, and its consequences can't be predicted. **It is certain that - in the short term - U.S. financial and technological superiority would increase** the already prominent gap in military power between Washington and the rest of the world. In addition, some of the new weapons could give the White House new effective tools to fight against symmetrical (states) and asymmetrical (terror networks) threats. However, in the long run, a military colonization of outer space could very well be started by other powers - which would hardly tolerate Washington's quasi-private use of space.

Weapons check Chinese attacks—maintains tech dominance

Lague 8—David, space correspondent for the International Herald Tribune, “China warns U.S. on plan to destroy a satellite;

Beijing sees threat to security in space” February 19, 2008, pg 1

For the Chinese military, the capacity to destroy U.S. navigation and communications satellites could **undermine the overwhelming technological dominance** that U.S. forces have enjoyed in recent conflicts, according to U.S. and Chinese security experts. They say that **space weapons including antimissile satellites** could contribute to Beijing's ''area denial'' strategies, which are intended to keep U.S. forces at bay in a war over Taiwan. In academic papers, books and magazine articles, Chinese strategic thinkers have identified U.S. dependence on satellites for battlefield communications, guiding smart weapons, reconnaissance and weather forecasting as a potential weakness that could be exploited.

Weapons stimulate the space industry—maintains economic well-being

Loomer et al 8—Scott, PhD and senior member of the National Geospatial Intelligence Agency, and the Industrial College of the Armed Forces—Space, Spring 2008, “Space Industry: Final Report” pg 17

Protecting Vital U.S. Interests The U.S. is dependent on the unhindered use of space for its economic well-being and security. The U.S. National Space Policy states unequivocally that the United States considers space capabilities vital to its national interests.11 Beyond military applications and security, space technology is used for many important purposes such as meteorology, environmental monitoring, disaster prevention, communications, entertainment, and observation. The loss or impairment of space capabilities could substantially harm the U.S. economically, militarily, and politically.113 The main arguments for pursuing a weapons capability in space center on deterring and defending against any disruption of our Nation's continued peaceful use of space. The following list the supporting rationale. Threat Threats to U.S. space assets, both from the ground and in space, are real and growing. A number of states are developing capabilities that could place U.S. space systems at risk.114 A dozen countries can now launch satellites, and potentially weapons, to space.11" For example, China demonstrated an anti-satellite capability in January 2007 by shooting down one of its own weather satellites.116 Although nascent, these developments are nonetheless troubling. The U.S. must be prepared to protect its own space assets and interests. Defensive Usage. The U.S. is committed to the exploration and use of space by all nations for peaceful purposes, and for the benefit of all humanity." Advocates for a space weapons capability emphasize that the purpose of those weapons is mainly defensive in nature, providing "big stick"" deterrence. However, in cases where deterrence fails, the U.S. requires a 118 capability to deny freedom of action to adversaries in order to protect its own. Impracticality of Verification. Current policy rejects any limitations on the fundamental right of the U.S. to operate in and acquire data from space.11 Besides the agreement not to deploy nuclear weapons or any other kinds of weapons of mass destruction in space,1 0 the U.S. has refrained from signing any obligations that would further restrict available weapon options. Proponents of weaponizing space argue that arms control agreements are unverifiable and unenforceable and would unacceptably disadvantage the U.S. Protecting Investments. Developing a capability to control or dominate space is not a new venture for the U.S.121 From the first days of space flight, military and scientific exploration efforts have been intricately linked. In the last several decades, commercial developments have also become intertwined with other U.S. efforts. **The viability and health of the U.S. space industry depends on continued** **cooperative** **engagement. Decreasing military efforts excessively could have considerable negative impact in other sectors of the industry.**

**Space weapons stimulate private sector development**

Pfatlzgraff 9—Robert Pfaltzgraff, PhD and president of the Institute for Foreign Policy, January 2009, “Space and US Security- A Net Assessment”

Last but not least, there is a close relationship between the military and commercial uses of space. It becomes difficult, if not impossible, to delineate clearly between space as an indispensable military arena and space as essential to economic wellbeing. Without space the phenomenon of globalization would not be possible. Global information and communications, including the Internet, wireless communications, data transmission, and electronic commerce, are based on space assets that have transformed how we transmit and receive the information that shapes twenty-first-century interaction. **New industries have emerged as a result of space technologies**. The private-sector commercialization of space is generating new products, services, and nongovernmental participation. **A global private-sector space industry will grow extensively in the decades ahead**. Therefore, such activity and its implications for **the military space sector must be factored into projections about the future** for reasons that are set forth in the net assessment.

Military space assets will strengthen the space technology base

Pfatlzgraff 9—Robert Pfaltzgraff, PhD and president of the Institute for Foreign Policy, January 2009, “Space and US Security- A Net Assessment”

As the leading space power, the greater dependence of the United States on space than any other nation leads inevitably both to vulnerabilities and opportunities. The U.S. position in space is the result of numerous strengths developed over more than five decades. They fall into two broad, overlapping categories: (I) military force enhancement; and (2) commercial utilization of space. We turn first to military force enhancement, setting forth in brief fashion the major technologies on which the United States has become increasingly dependent in recent decades, together with systems that are currently projected to be deployed in the next several years. **Because of the dual-use nature of these technologies, it is not easy to separate them from the commercial sector**. Therefore, the failure of the United States to remain in the forefront of space technologies would have both military and commercial implications. **Advances in the military or civilian sectors will over lap, intersect, and reinforce each other**. Consequently, the development in the United States of a dynamic innovative private-sector space industry will be indispensable to future U.S. space leadership. Nevertheless, **the ability of the U.S. military both to contribute to**, and benefit from, **such a space technology base** will depend on its focus and priorities. The availability of technologies does not lead inevitably to their exploitation. We may fail to move forward to exploit technological opportunities and breakthroughs. Such choices may be based on political or other considerations, whether well founded or the product of mistaken assumptions about what competitors or adversaries will or will not do.

Government funding is key—strengthens the commercial sector

Pfatlzgraff 9—Robert Pfaltzgraff, PhD and president of the Institute for Foreign Policy, January 2009, “Space and US Security- A Net Assessment”

Space has become an essential part of daily life. This includes satellites that transmit television images, provide weather forecasting data, emergency response, the infrastructure for the Internet, the mapping of the Karth's surface, and global positioning information. Space technologies are transforming the process by which we conduct business and undertake research. **The net result is greater productivity with important implications for economic growth, prosperity, and innovation**. Access to space-based assets is essential for a broad range of private-sector activities, which will increase both in scope and intensity as a result of the emergence of technologies including smaller satellites and cheaper boosters, miniaturization, and greater economies of scale. The space infrastructure originally established **with governmental funding** has furnished the basis for both military and commercial applications. In the years ahead, the commercial sector is likely to provide innovative impetus that spills over into the military arena.

**Space weapons boost technological superiority and deters challengers**

McLaughlin 2—Kevin McLaughlin, Vice Commander at U.S. Air Force Warfare Center and senior fellow at CSIS, Summer 2002, “Would Space-Based Defenses Improve Security?” pg 185

Observers have not yet fully understood or analyzed another possible reality. The current striking disparity between the United States and all other countries in economic, technological, and military endeavors places extreme limits on most countries’ abilities to respond meaningfully. Old concerns that U.S. advances in missile defense or space would spawn undesirable arms races may no longer be valid.3 For example, the United States is the only nation capable of implementing and sustaining decisive military force on a global basis. The war in Afghanistan provided a snapshot of this ability. The nation’s development and use of many capabilities—modern airpower; long-range precision weapons; command, control, and communications and intelligence; and highly skilled soldiers, sailors, marines, and airmen—have drastically outpaced all other countries. No other country could carry out the mission that the United States is executing in Afghanistan. Any other country or alliance, such as the proposed 60,000-person European Rapid Reaction Force, performing a similar mission in the near term or in the midterm is equally doubtful. Even more significantly, in the current global war on terrorism, the United States is working to increase the scope of its capabilities to operate simultaneously in several spots around the world. Primarily, U.S. wealth, global responsibilities, and national security needs drive this reality. The administration’s FY 2003 defense budget request of $379 billion is more than six times larger than that of Russia, the second-largest spender, and more than the combined spending of the next 25 nations.4 This disparity creates its own dynamic with unique qualities, one of **which may be the elimination of the incentive for many nations** **even to try to compete**, decreasing the likelihood that U.S. developments will face traditional countermeasures. For example, the B-2 stealth bomber provides the United States with an unchallenged military capability that other nations would have viewed as destabilizing only a few years ago. The airplane can fly anywhere in the world undetected and can attack targets through defenses that officials previously thought were impenetrable. Yet, this revolutionary capability has not given rise to a race to build stealth bombers, nor has it resulted in a huge defensive investment by the Chinese, the Russians, or the Europeans to develop technology to counter it. Other nations have not cried out in indignation—an indication that the United States can use such overwhelming capabilities without threatening the world’s strategic stability. Other than the B-2, any number of **U.S. technological advances**, such as unmanned combat air vehicles (UCAVs), information dominance capabilities, and the previously mentioned SBIRS system, serve as examples of advanced U.S. warfighting capabilities revolutionizing the nation’s military capabilities and further increasing the disparity between the United States and the rest of the world, but that have not seemed to produce arms races or other traditional responses. For these reasons, **U.S. development of spacebased** **missile defenses will arguably contribute to U.S. security and possibly** **in a way neither destabilizing nor likely to spawn an arms race in space.**

## BP k2 Aerospace

The plan revitalizes the aerospace industry

Pfatlzgraff 9—Robert Pfaltzgraff, PhD and president of the Institute for Foreign Policy, January 2009, “Space and US Security- A Net Assessment”

The effect of such funding decisions for missile defense and national security space systems is significant. According to the MDA Director, General Obering, MDA has had to "restructure some development activities and cancel others as a result of reductions in the FY 2008 budget. Reductions in funding for [MDA] programs will result in some schedule delays."6' In addition to schedule delays for STSS, two promising possibilities will not be pursued at all unless Congress changes direction on the Space Test Bed: (1) twenty-first century upgrades to I980s-era Brilliant Pebbles technology that would enhance both the effectiveness and fiscal feasibility of space-based kinetic energy interceptors; and (2) development of space-based directed energy lasers that were originally intended to augment GPALS capabilities. In order to provide for the future security of the United States and its allies against emerging threats, Congress must work to ensure that near term capabilities are not funded at the expense of long-term development projects. Indeed, the greatest danger in MDA's current budget is that it increasingly strains the Agency's overall mission to develop a balanced program between current and future missile threats. Future spending is directed toward near-term fielding. To do this within budget constraints, MDA is sacrificing options for the future. Further cuts will only heighten this imbalance, with serious implications for our future security.66 Barring a long term approach to funding, the potential for space-based assets to detect, deter, and destroy missile threats will be wasted entirely and unnecessarily.6 Future Workforce Development. If current trends continue, the United States will not have the specialized workforce necessary to support future U.S. primacy in space. Indeed, there is a major crisis in the aerospace industry, both in terms of sustaining the current workforce and developing the workforce of the future. With the reductions in defense spending that followed the end of the Cold War, the United States lost over 600,000 scientific and technical aerospace jobs.6\* According to the Aerospace Industries Association, total industry employment went from 1,120,800 in 1990 down to 637,300 in 2007. In the space sector alone, employment slipped from I 68,500 to 75,200 over the same period of time.6" Of the employees that remained following the initial post-Cold War cuts, it is suggested that 27 percent of America's aerospace technical workforce is now eligible for retirement. This is simply the continuation of a wave of retirements that began some time ago70The Aerospace Industries Association contends that nearly 60 percent of the U.S.-aerospace workforce was at least 45 years old in 2007. What is significant is that because many began their careers relatively young, a large number will be eligible for retirement in the next decade. Clearly, the workforce that supported U.S. space primacy during and immediately following the Cold War will need to be replenished with the infusion of new talent.

## RMA

Space weapons increase technological advancements within the RMA framework

Neary 8—Michael Neary, second-year MA candidate in the International Politics program of the School of International Service, Fall 2008, “Space: The Next Revolution in Military Affairs?” pg 102-123

Is the militarization of space an aspect of the contemporary Revolution in Military Affairs (RMA) or does it represent a new military revolution entirely? RMAs are conceptual models of military transformation. They highlight revolutionary improvements in how an armed force fights and wins wars. The present RMA is generally defined as a fusion of advanced information and precision-strike technologies with a new doctrine that emphasizes overwhelming dominance and rapid victory on the battlefield. The objective of this study is to discern where the role of **space weapons fits within the** **conceptual framework of the RMA. The development of space weapons** **signifies technological advancement in military capability, a potential** **leap that represents an emphasis on high-end weaponry that is** **part of the contemporary revolution.** However, to answer this research question, one must differentiate whether this advancement is in line with those that are part of the contemporary military revolution, or if it surpasses the principles of this concept as they are commonly defined to encompass an entirely new transformation in war fighting. A recent case study that highlights the complex role of space militarization within the RMA conceptual framework is China’s January 2007 anti-satellite weapon test. In this weapon test, the People’s Liberation Army (PLA) unexpectedly destroyed an ageing Chinese weather satellite in orbit using a ground-based missile system.1 Numerous states expressed their concern about this unexpected action, including the regional military players of Australia, Japan, and South Korea.2 As expected, the United States expressed grave concern as well. Since the U.S. armed forces are significantly reliant on satellite technology, Washington has expressed distress about the security of its own space assets in light of this development.3 The weather satellite, positioned over 500 miles above the earth’s surface, orbited in a range in which some American spy satellites operate. Furthermore, by successfully targeting an orbiting satellite, China joined an exclusive club of states that has been able to destroy objects in space, the others being the former Soviet Union and the United States. The PRC’s apparent ability to target and destroy space assets pinpoints the advancing technological capabilities of the PLA. Moreover, it demonstrates China’s understanding of the important roles held by orbital systems in modern warfare, such as in communications networking and intelligence gathering. This blend of technical knowhow with strategic doctrinal vision enables a tactical advantage that represents the essence of Revolutions in Military Affairs. As dictated by a popular American science fiction television series of the 1960s, space is indeed the final frontier. Those states that possess the economic and technological capability to deploy space-based weapons would possess clear qualitative advantage over current or potential adversaries that do not possess such elements of hard power. In addition, realist theory would predict that the militarization of space by one state would precipitate power balancing.5 Thus, it is important to examine the phenomenon of space weapons within the context of a potential future RMA, a process that is sympathetic to realist principles because of its potential role in the creation of an entirely new arms race. Furthermore, the importance of studying space weapons within an RMA conceptual framework helps to examine the theoretical foundation of so-called military revolutions. In sum, this study will further add to the scholarly literature on the topic of military revolutions by not only determining what constitutes the con- temporary RMA, but also by exploring the feasibility of future military revolutions within an outer space context.

RMA provides the US with tactical superiority that wins wars—empirics prove

Neary 8—Michael Neary, second-year MA candidate in the International Politics program of the School of International Service, Fall 2008, “Space: The Next Revolution in Military Affairs?” pg 102-123

The primary advantage of the RMA is that it can provide a state with an enormous tactical advantage over its adversaries. Shaw argues that the technological focus of the RMA provided the United States with a qualitative advantage over the outgoing Soviet Union and the rising People’s Republic of China.17 The contemporary RMA was a transformation that enabled the U.S. to possess overwhelming tactical superiority over the two great powers which were the closest to posing a potential threat to its security. However, as the post-Cold War period progressed, the U.S. entered into conflicts against international actors with much weaker capabilities, such as Iraq. As a result, the United States harnessed its enormous advantage in force capabilities to ensure not only overwhelming victory, but one that was surely **immediate and decisive**. These principles were established as the new doctrine of American warfare, one that was compatible with the emerging technology that enabled the implementation of the RMA.

Space weapons are integral to RMA capabilities

Neary 8—Michael Neary, second-year MA candidate in the International Politics program of the School of International Service, Fall 2008, “Space: The Next Revolution in Military Affairs?” pg 102-123

The present heavy reliance on satellites for information gathering in the conduct of warfare indicates that **space technology is an integral** **component of the contemporary RMA.** What this study seeks to address is whether current as well as proposed space-based military systems can be considered parts of a new military revolution. Morgan writes that, in the first Gulf War, the U.S. military utilized the services of a wide satellite network to gain intelligence and provide tactical guidance for weapons systems.20 Randolph by implication places military space-based assets within the context of the RMA as well. He writes that satellite networks are an enormous resource to military endeavors in that they permit the U.S. to maintain its informational advantage, a critical aspect of the contemporary RMA.21 Mowthorpe agrees with this sentiment when he argues that the tactical advantage of **space as a new frontier of warfare is a primary factor of the present** **military revolution**.22 However, Gray and Sheldon argue that the militarization of space is not a component of the contemporary RMA, but a method by which the contemporary RMA can be implemented.23 They provide a key argument when they both surmise that space militarization can be considered an RMA when outer space is used as a battleground such as land or sea is used today. In contrast, O’Hanlon places space weapons within the contemporary RMA context, specifically in what he labels the school of “Global Reach, Global Power.” He writes that some U.S. military officials believe that advancement should continue into the realm of outer space with such hypothetical weapons systems such as direct-energy and intercontinental artillery systems.24 Latham encapsulates the argument simply when he states that history has witnessed occasional transformations in the manner of armed conflict.25 Thus, based on certain strategic factors, the potential exists for space militarization to represent a new dawn in military revolutions at some future point.

The plan revolutionizes RMA and builds war-fighting capability

Neary 8—Michael Neary, second-year MA candidate in the International Politics program of the School of International Service, Fall 2008, “Space: The Next Revolution in Military Affairs?” pg 102-123

Going beyond existing technologies to more advanced assets and weaponry allows for the possibility of space weapons to represent an eventual entirely new military revolution. Some advanced spacebased armaments that are currently in the planning stages or have not yet been realized are potentially representative of a future RMA framework. These technologies are true space weapons in that they would broaden war-fighting to transform outer space into a new domain of battle.57 Technologies that could fall within this future framework, if they become operational, would be those such as Falcon, the proposed American space-plane. Falcon is a program that has been under development by the Defense Advanced Research Projects Agency (DARPA) of the U.S. Department of Defense. It entails the construction of an aircraft labeled the Hypersonic Cruise Vehicle (HCV), a new form of weapons transportation that could carry a 12,000 lb payload to a distance of over 9,000 nautical miles in less than two hours.58 The Small Launch Vehicle (SLV), another component of the Falcon Program, would be able to launch military payloads, such as intelligence- gathering technology, into low earth orbit.59 Open-source information on proposed space-based weapon systems from other international actors is rather minimal. Systems that have been made known include those under development by China. According to Tellis, Beijing has been able to develop its laser weapons program to a level that could one day make them an operational asset of the People’s Liberation Army (PLA).60 These could theoretically destroy orbital military assets from ground-based installations. Another system is the newly tested anti-satellite weapon. If this system ever becomes fully operational, it could destroy military satellites in low-earth orbit, such as those responsible for intelligence-gathering, as well as spacecraft in medium-earth orbit.61 India has also been mentioned has a potential candidate for developing space-based weapons. Hitchens speculates that Indian military planners have discussed developing their own anti-satellite weapons program due to a proposal by the air force to create a command structure that would initiate space weapons development.62 Russia, although having tested an anti-satellite system in the late 1960s, and possessing the research and development capabilities to undertake a space weapons program, has not seriously considered any initiative to produce space weapons systems.63 In order for these weapon systems to constitute a new RMA, they must not only go beyond the drawing board and testing stage, but must also be used by armed forces as a routine part of warfare. In a manner similar to the use of satellite technology today, the Hypersonic Cruise Vehicle of the United States, or laser weapons of the PRC, must become a standard element of military hardware that is utilized as an integral part of battlefield operations in order for them to be considered part of a future military revolution.64 **If and when the** **American missile defense system comes online, this could also** theoretically **be considered a component of a new space-based military** **revolution since it is not only an element of advanced space weaponry** **but is also intended to be a regular defensive mechanism against potential** **missile strikes against the U.S. and its allies.** Essentially, if space weapons systems are only utilized rarely, then they will not be able to generate the transformation in warfare that is needed to constitute an RMA. On the contrary, if they are regular components of warfare, then they will have changed how wars are fought and brought about a new RMA.

Space weapons are key to RMA

Neary 8—Michael Neary, second-year MA candidate in the International Politics program of the School of International Service, Fall 2008, “Space: The Next Revolution in Military Affairs?” pg 102-123

Space weapons certainly are a component of the contemporary Revolution in Military Affairs. American military space assets are an integral aspect of the current military revolution because of their routine support function for information gathering and precision-strike bombing. Future military technology for use in space, if it becomes operational as well as a regular part of armed conflict, should be considered a new RMA since it will transform the way in which future wars are fought. However, its success is contingent upon political support, the realization of its worth against the future adversaries of the United States, and a functional military doctrine that could establish a strategy by which these systems are regarded as an integral aspect of how warfare is conducted.

## RMA AT: Reps K’s?

Adversarial depictions are critical to RMA

Neary 8—Michael Neary, second-year MA candidate in the International Politics program of the School of International Service, Fall 2008, “Space: The Next Revolution in Military Affairs?” pg 102-123

Perhaps most importantly, for space weaponry to engender a new military revolution**, these systems must be developed and deployed** **with a clear adversary in mind**. As discussed above, it has been difficult to effectively implement a new RMA without considering a specific challenger to one’s national interests. 73 American military planners would have to consider which state or non-state actors would be vulnerable to the capabilities provided by the deployment of space-based weapons systems. At present, a well-defined adversary is not outlined in the space policy of the U.S. This could be very well due to the lack of space-based weapons systems, the functional development of which would create the strategic environment in which an adversary could be more clearly defined. As with changes in military doctrine in regards to the uses of outer space, the future may witness the clarification of what constitutes a threat to U.S. security vis-à-vis outer space as the technology develops and becomes practical enough for everyday use.

\*\*\*EMP Impact Extns\*\*\*

The power outage resulting from an EMP attack shuts down the financial sector, bringing the economy to an instant stop

Graham and Frankel et. Al 8 - Dr. William R. Graham, Chairman of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack, and Dr. Michael J. Frankel, Executive Director of the EMP Commission and one of the Nation’s leading experts on the effects of nuclear weapons, April 2008, “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack,” The Commission to Assess the Threat to the United States from an EMP Attack, http://www.empcommission.org/docs/A2473-EMP\_Commission-7MB.pdf

Despite the robustness of U.S. financial infrastructures against a wide range of threats, they were not designed to withstand an EMP attack. Indeed, the highly sophisticated electronic technologies that make the modern U.S. financial infrastructure possible are the components most vulnerable to EMP. An EMP attack that disrupts the financial services industry would, in effect, stop the operation of the U.S. economy. Business transactions that create wealth and jobs could not be performed. Loans for corporate capitalization and for private purposes, such as buying homes and automobiles could not be made. Wealth, recorded electronically in bank databases, could become inaccessible overnight. Credit, debit, and ATM cards would be useless. Even reversion to a cash economy might be difficult in the absence of electronic records that are the basis of cash withdrawals from banks. Most people keep their wealth in banks and have little cash on hand at home. The alternative to a disrupted electronic economy may not be reversion to a 19th century cash economy, but reversion to an earlier economy based on barter.

An EMP attack would devastate electronics which would be disastrous for the country in multiple areas

Graham and Frankel et. Al 8 - Dr. William R. Graham, Chairman of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack, and Dr. Michael J. Frankel, Executive Director of the EMP Commission and one of the Nation’s leading experts on the effects of nuclear weapons, April 2008, “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack,” The Commission to Assess the Threat to the United States from an EMP Attack, http://www.empcommission.org/docs/A2473-EMP\_Commission-7MB.pdf

The electromagnetic pulse generated by a high altitude nuclear explosion is one of a small number of threats that can hold our society at risk of catastrophic consequences. The increasingly pervasive use of electronics of all forms represents the greatest source of vulnerability to attack by EMP. Electronics are used to control, communicate, compute, store, manage, and implement nearly every aspect of United States (U.S.) civilian systems. When a nuclear explosion occurs at high altitude, the EMP signal it produces will cover the wide geographic region within the line of sight of the detonation.1 This broad band, high amplitude EMP, when coupled into sensitive electronics, has the capability to produce widespread and long lasting disruption and damage to the critical infrastructures that underpin the fabric of U.S. society. Because of the ubiquitous dependence of U.S. society on the electrical power system, its vulnerability to an EMP attack, coupled with the EMP’s particular damage mechanisms, creates the possibility of long-term, catastrophic consequences. The implicit invitation to take advantage of this vulnerability, when coupled with increasing proliferation of nuclear weapons and their delivery systems, is a serious concern. A single EMP attack may seriously degrade or shut down a large part of the electric power grid in the geographic area of EMP exposure effectively instantaneously. There is also a possibility of functional collapse of grids beyond the exposed area, as electrical effects propagate from one region to another

Serious threat of EMP- can and must be addressed

Foster et al 4 – Dr. John S. Foster Jr, chairman of the Board of Pilkington Aerospace, Inc. and Chairman of Technology Strategies and Alliances, Earl Gjelde, served as President George Herbert Walker Bush’s Deputy Secretary and Chief Operating Officer of the US Department of the Interior, Dr. William R. Graham, NASA Deputy Administrator, Dr. Robert J. Hermann, Chairman of the Board 1998-00 American National Standards Institute, Vice President for Corporate Development at SAIC, GEN Richard L. Lawson, USAF (Ret.), Dr. Gordon K. Soper employed by Defense Group Inc, Dr. Lowell L. Wood, Jr., a scientist-technologist who has contributed to technical aspects of national defense, “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack,” Volume 1: Executive Report 2004, http://www.empcommission.org/docs/empc\_exec\_rpt.pdf

Several potential adversaries have or can acquire the capability to attack the United States with a high-altitude nuclear weapon-generated electromagnetic pulse (EMP). A determined adversary can achieve an EMP attack capability without having a high level of sophistication. **EMP is one of a small number of threats that can hold our society at risk of catastrophic consequences**. EMP will cover the wide geographic region within line of sight to the nuclear weapon. It has the capability to produce significant damage to critical infrastructures and thus to the very fabric of US society, as well as to the ability of the United States and Western nations to project influence and military power. The common element that can produce such an impact from EMP is primarily electronics, so pervasive in all aspects of our society and military, coupled through critical infrastructures. Our vulnerability is increasing daily as our use of and dependence on electronics continues to grow. The impact of EMP is asymmetric in relation to potential protagonists who are not as dependent on modern electronics. The current vulnerability of our critical infrastructures can both invite and reward attack if not corrected. Correction is feasible and well within the Nation's means and resources to accomplish.

EMP destroys key infrastructure and decimates space capabilities

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

The EMP Threat According to the 2004 report of the EMP Commission, 85 the United States faces a threat from EMP that could have catastrophic consequences based on even a single nuclear warhead. EMP is generated by any nuclear weapon burst at any altitude above a few dozen kilometers, with the height of burst being significant in determining the area exposed to EMP. The EMP threat arises from the ability, whether by terrorists or states, to launch relatively unsophisticated missiles with nuclear warheads to detonate at altitudes from 40 to 400 kilometers above the earth's surface. The rationale for such action would be the high political-military payoff in the form of devastating consequences. An EMP attack would constitute a highly successful asymmetric strategy against a society as heavily dependent as the United States is on electronics, energy, telecommunications networks, transportation systems, the movement of inventories in its manufacturing sector, and food processing and distribution capabilities. As noted in the EMP Commission report, EMP was an unintended result of a nuclear detonation at an altitude of about 400 kilometers during the Starfish nuclear weapons tests above Johnstone Island in the Central Pacific in 1962. The effects, felt some 1400 kilometers away in Hawaii, included "the failure of street lighting systems, tripping of circuit breakers, triggering of burglar alarms, and damage to a telecommunications relay facility." Nuclear tests conducted by the Soviet Union, also in 1962, produced damage to overhead and underground buried cables at distances as far away as 600 kilometers, together with surge arrester burnout, spark-gap breakdown, blown fuses, and power-supply breakdown.8'' The destruction and mayhem caused by an EMP explosion would be far more substantial today given the ubiquity of electronics and society's increased reliance on them to run critical infrastructures. Several potential enemies either already have, or could soon acquire, the capability to attack the United States with a high-altitude nuclear explosion EMP that would cover a wide geographic region. Such a weapon need not be detonated directly over the United States itself to produce major damage to America's critical infrastructures such as telecommunications, banking and finance, fuel/energy, transportation, food and water supply, emergency services, government activities, and space systems. U.S. satellites, both civilian and military are vulnerable to a range of attacks that include EMP, especially in low-earth orbits. Again, as the EMP Commission concluded, "The national security and homeland security communities use commercial satellites for critical activities, including direct and backup communications, emergency response services, and continuity of operations during emergencies."87 Such satellites could be disabled by collateral radiation effects from an EMP attack on ground targets. Thus it is obvious that an interdependence exists between the objects of a potential EMP attack. Disabling one of the infrastructures, such as telecommunications or electricity, would have severe consequences for others, with cascading effects from which an advanced, technologically dependent society such as the United States might not easily recover. An EMP attack mounted against the United States would have far broader international consequences, given the interdependence of America and other economies in an era of globalization. An EMP attack against other economies, such as Japan or a European nation, would have major effects in the United States, and on other countries if the attack was on the United States. The services that would be essential to cope with the consequences of a terrorist attack, such as hospitals and emergency services, themselves might be disabled and therefore would not be available when and where they were most needed. As Senator John Kyi has pointed out. "A terrorist organization might have trouble putting a nuclear warhead on target' with a Scud, but it would be much easier to simply launch and detonate in the atmosphere. No need for the risk and difficulty trying to smuggle a nuclear weapon over the border or hit a particular city. Just launch a cheap missile from a freighter in international waters -al-Qaeda is believed to own about eighty such vessels - and make sure to get it a few miles in the air."88

Financial infrastructure would not be able to weather an EMP, they pose a unique risk

Graham and Frankel et. Al 8 - Dr. William R. Graham, Chairman of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack, and Dr. Michael J. Frankel, Executive Director of the EMP Commission and one of the Nation’s leading experts on the effects of nuclear weapons, April 2008, “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack,” The Commission to Assess the Threat to the United States from an EMP Attack, http://www.empcommission.org/docs/A2473-EMP\_Commission-7MB.pdf

An EMP attack would pose the very kind of simultaneous and widespread threat postulated by the NAS that would be fatal to the financial infrastructure but judged by them to be too difficult to execute and implausible for cyberterrorists. EMP effects propagate at the speed of light and would cover a broad geographic area. Such an attack potentially could achieve the NAS criteria for financial infrastructure catastrophe: “simultaneous destruction of all data backups and backup facilities in all locations.”34An EMP would probably not erase data stored on magnetic tape. However, by shutting down power grids and damaging or disrupting data retrieval systems, EMP could deny access to essential records stored on tapes and compact discs (CD). Moreover, because EMP physically destroys electronic systems, it is also in the category of threats that NSTAC concludes are more worrisome than cyberterrorism: “Physical attacks remain the larger risk for the industry.” The vast majority of electronic systems supporting the financial infrastructure have never been tested, let alone hardened, against EMP. Yet the enormous volume, speed, and accuracy required of the electronic infrastructure supporting the financial services industry u. Financial operations could not tolerate the kind of disruptions or mass systemic destruction likely to follow an EMP attack.

Power outages resulting from an EMP guarantee a total shut down of the financial system, causing staggering economic losses

Graham and Frankel et. Al 8 - Dr. William R. Graham, Chairman of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack, and Dr. Michael J. Frankel, Executive Director of the EMP Commission and one of the Nation’s leading experts on the effects of nuclear weapons, April 2008, “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack,” The Commission to Assess the Threat to the United States from an EMP Attack, http://www.empcommission.org/docs/A2473-EMP\_Commission-7MB.pdf

These observations suggest that, if an EMP attack were to disrupt the financial industry for days, weeks, or months rather than hours, the economic impact would be catastrophic. The prolonged blackout resulting from Hurricane Katrina in August 2005 is a far better example than the Northeast blackout of 2003 of the challenge that would be posed to the financial infrastructure from EMP. The Katrina blackout, comparable to a small EMP attack, disrupted normal business life for months and resulted in a staggering economic loss that is still an enormous drain on the national economy. The financial network is highly dependent on power and telecommunications for normal operations. Widespread power outages would shut down the network, and all financial activity would cease until power was restored, as happened during Hurricane Katrina. Even if power were unaffected or restored in short order, full telecommunications are required to fully enable the financial network.

Even after power is restored, economic shock creates fear which makes the recovery process much longer

Graham and Frankel et. Al 8 - Dr. William R. Graham, Chairman of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack, and Dr. Michael J. Frankel, Executive Director of the EMP Commission and one of the Nation’s leading experts on the effects of nuclear weapons, April 2008, “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack,” The Commission to Assess the Threat to the United States from an EMP Attack, http://www.empcommission.org/docs/A2473-EMP\_Commission-7MB.pdf

In the aftermath of an EMP attack, individuals and corporations would have many sound reasons for being cautious, risk averse, and unwilling to resume business as usual. Once power, telecommunications, and transportation are restored, even if restored promptly, within a matter of days, psychological concerns that affect economic revitalization may linger. Full recovery will require restoring the trust and confidence of the business community in the infrastructures, in financial institutions, and in the future. The Great Depression outlasted its proximate causes by many years, despite strenuous efforts by the Federal Government to implement financial reforms and jump-start the economy, in part because businesses were unwilling to risk their capital in a system that had lost their confidence.

## EMP Extns: SMD Key

Russia/Iran developing tech for EMP attack—SMD is key to prevent that – hardens infrastructure

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

Notably, Russia has considered attack options that include EMP. During the May 1999 NATO air campaign against Serbia, members of the Russian Duma, meeting with U.S. congressional counterparts, reportedly speculated about the paralyzing effects of an EMP attack on the United States.89 To amplify on the Rumsfeld statement cited under "Ship-borne Scud Threat," above, Iran is reported to have tested whether its ballistic missiles, such as the Shahab-3 or the Scud, could be detonated by remote control while still in high-altitude flight. The most plausible explanation for such tests is that Iran is developing the capability to explode a high-altitude nuclear weapon that could destroy critical electronic and technological infrastructures.90 Without an effective missile defense the United States will remain vulnerable to the EMP threat given its extensive dependence on high-tech, electronic infrastructure that cannot easily be hardened to withstand such an attack. The ability to launch an incapacitating EMP strike against the United States provides enemies with an asymmetric threat that would not only inhibit U.S. military action but would also strike a severe economic and psychological blow.

SMD key to avoid electromagnetic release from nuke weapons- solely relying on them while in space causes destruction to satellites

Lambakis 7 – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

It is also known that enemies of the United States can put a nuclear weapon over U.S. territory using a ballistic missile. The detonation of this weapon at a high altitude could unleash an electromagnetic pulse that would wipe out satellite and airborne navigation, intelligence, and communications systems and impede any U.S. military response to the aggression. Such a pulse of energy would disable or destroy the unprotected technological infrastructure of a region or the nation. According to the emp Commission, "a regional or national recovery would be long and difficult and would seriously degrade the safety and overall viability of our nation. . . . [A]t some point the degradation of infrastructure could have irreversible effects on the country's ability to support its population."

Space-based interceptors may be the only effective way to counter this threat and mitigate the effects of an electromagnetic pulse resulting from the intercept. Engaging the missile close to its launch point would release the resulting explosion of gamma rays closer to the attacker's territory. Relying on an intercept in space, in the midcourse of a missile's flight, risks damaging unprotected satellites (i.e., just about all commercial and civilian satellites), regardless of who owns them.

## EMP Extns AT: Deterrence Solves

Traditional deterrence fails against an EMP attack and the US is extremely vulnerable to an attack

Graham and Frankel et. Al 8 - Dr. William R. Graham, Chairman of the Commission to Assess the Threat to the United States from Electromagnetic Pulse Attack, and Dr. Michael J. Frankel, Executive Director of the EMP Commission and one of the Nation’s leading experts on the effects of nuclear weapons, April 2008, “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack,” The Commission to Assess the Threat to the United States from an EMP Attack, http://www.empcommission.org/docs/A2473-EMP\_Commission-7MB.pdf

The consequences of an EMP event should be prepared for and protected against to the extent it is reasonably possible. Cold War-style deterrence through mutual assured destruction is not likely to be an effective threat against potential protagonists that are either failing states or trans-national groups. Therefore, making preparations to manage the effects of an EMP attack, including understanding what has happened, maintaining situational awareness, having plans in place to recover, challenging and exercising those plans, and reducing vulnerabilities, is critical to reducing the consequences, and thus probability, of attack. The appropriate national-level approach should balance prevention, protection, and recovery. The Commission requested and received information from a number of Federal agencies and National Laboratories. We received information from the North American Electric Reliability Corporation, the President’s National Security Telecommunications Advisory Committee, the National Communications System (since absorbed by the Department of Homeland Security), the Federal Reserve Board, and the Department of Homeland Security. Early in this review it became apparent that only limited EMP vulnerability testing had been accomplished for modern electronic systems and components. To partially remedy this deficit, the Commission sponsored illustrative testing of current systems and infrastructure components. The Commission’s view is that the Federal Government does not today have sufficiently robust capabilities for reliably assessing and managing EMP threats

# \*\*\*Solvency\*\*\*

## SBMD ready now

What it would be like to deploy BP today:

Tech proven

16.4 billion today

Viability confirmed 20 years ago

Only need to resurrect the technologies

Most of it is very advanced

Kleinberg 11- Howard Kleinberg is a member of the graduate faculty of the Department of Public & International Affairs at University of North Carolina Wilmington. The author has a Master of Arts in the Security Studies Program from Georgetown University, Washington, D.C. and a Bachelor of Science in Electrical Engineering from the University of Toronto, Canada. He also has 25 years of experience in the U.S. Defense Sector, the Space Industry, and software engineering, March 1, 2011, “A global missile defense 'network': terrestrial High-Energy lasers and Aerospace mirrors part 1 of 2.” Fires , http://www.highbeam.com/doc/1G1-251954702.html

Brilliant Pebbles. The original space-based kinetic -energy kill weapon, Brilliant Pebbles was a critical component of the Reagan administration's strategic defense initiative program in the 1980s. Indeed, Brilliant Pebbles was by far the most mature of all the SDI weapon programs, and was ready for RDT&E as a déployable weapon system, back in that era. It was to have been deployed in large numbers in LEO to defend against Soviet ICBMs in their boost and midcourse flight phases, with some terminal phase capability inherent in the system, as well.

Contrary to popular misconceptions both then and now, the technologies underlying BP were entirely viable at that time, as was proven in the Clementine I lunar-orbiter and ASTRID flight test programs of the early 1990s. The original cost to deploy 1,000 interceptors was slated to be $11 billion in 1989 dollars; this figure would be $16.4 billion today. A constellation of this size is estimated large-scale ICBM attack from Russia.

The salient point of the Brilliant Pebbles legacy is that all of the relevant technologies for kinetic -energy SB-BMD were viable and fly able in the 1990s, some 20 years ago, and were ready for several years before that. The debate over the viability of a space-based BMD system was also effectively ended in the affirmative, that long ago. As Brilliant Pebbles' creators point out, producing such a defense today would only require the 'resurrection' of its technologies. Indeed, the relevant avionics, sensors and guidance algorithms have leapt ahead by some 5 generations or more since the original development work in the early 1990s, at least in the form of the current generation of U.S. ground-based KE BMD weapons. Brilliant Pebbles-like weapons would form the optimal basis for a first generation of U.S. space-based missile-defense systems, according to Pfaltzgraff and Van Cleave.

Brilliant pebbles feasible

Pfaltzgraff 9- Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, April 3, 2009, “Boost Phase Missile Defense: Present Challenges, Future Prospects”, http://www.ifpa.org/pdf/Pfaltzgraff\_Boost-Phase.Missile.Defense\_Capitol.Hill-Marshall.Inst\_3.April.09.pdf

Space-based defenses as well as sea-based defenses, and I would add the airborne laser, have boost-phase intercept capabilities. Yet space-based defenses have been politically the most controversial and therefore politically the least acceptable. As a result we have failed to deploy space-based interceptors that could destroy missiles and warheads in boost phase as well as midcourse and terminal phases. As we point out in the IWG Report, the United States had developed a missile defense that could have begun operating as early as the mid 1990s that included space-based interceptors known as Brilliant Pebbles providing for a layered defense against missiles launched from any point against the United States itself of its interests overseas. By the early 1990s, as a result of the technology investments during the preceding decade, the space-based elements were more technically mature and capable of rapid development than the ground-based missile components of the missile defense system then envisioned. The space-based missile defense based on kinetic energy interceptors would have placed heavy emphasis on boost-phase interception. It was a program that had survived numerous peer reviews, had been approved by the Pentagon’s acquisition authorities, and yet was curtailed by Congress in 1991 and 1992 and then canceled by the Clinton Administration. Despite this cancelation, advances in the commercial , civil, and other defense sectors since that time would now permit even lighter mass, lower cost, and higher performance than would have been possible with the 1990-era technology base. Advances in technology would make possible boost-phase intercept of even short- and medium-range ballistic missiles as well as ICBMs.

We have tech and it’s key, need plan mandates

**Institute for Foreign Policy Analysis 6** – Independent Working Group on Missile Defense, the Space Relationship and the Twenty-First Century, 2007 report, Washington D.C., August 28, 2006

The benefits of space-based defense are manifold. The deployment of a robust global missile defense that includes space-based interdiction capabilities will make more expen- sive, and therefore less attractive, the foreign development of offensive ballistic missile technologies needed to over- come it. Indeed, the enduring lesson of the ABM Treaty era is that the absence of defenses, rather than their presence, empowers the development of offensive technologies that can threaten American security and the lives of American citizens. And access to space, as well as space control, is key to future U.S. efforts to provide disincentives to an array of actors seeking such power.

So far, however, the United States has stopped short of putting these principles into practice. Rather, the mis- sile defense system that has been deployed so far provides extremely limited coverage. It is intended as a limited de- fense against a small, rogue-state threat scenario. Left unaddressed are the evolving missile arsenals of – and potential missile threats from – modernizing strategic competitors such as Russia and China as well as terrorists launching short-range missiles such as Scuds from off-shore vessels.

The key impediments to the development of a more ro- bust layered system that includes space-based interdiction assets have been more political than technological. A small but vocal minority has so far succeeded in driving the de- bate against missile defense and especially space-based mis- sile defense. The outcome has been that political consider- ations have by and large dictated technical behavior, with the goal of developing the most technologically sound and cost-effective defenses subordinated to other interests.

A symptom of this problem is the fact that, in spite of a commitment to protecting the United States from ballis- tic missile attack, little has been done to revive the cutting- edge technologies developed in the 1980s and early 1990s – technologies that produced the most effective, least costly ways to defend the U.S. homeland, its deployed troops, and its international partners from the threat of ballistic missile attack. The most impressive of these initiatives was Brilliant Pebbles. By 1992, that initiative – entailing the deployment of a constellation of small, advanced kill-vehicles in space

* had developed a cheap, effective means of destroying en- emy ballistic missiles in all modes of flight. Yet in the early 1990s, along with a number of other promising programs, it fell victim to a systematic eradication of space-based tech- nologies that marked the closing years of the twentieth cen- tury and still impedes the development of the most effective missile defense today. The current state of affairs surrounding missile defense carries profound implications for the safety and security of the United States, and its role on the world stage in the de- cades to come. Without the means to dissuade, deter, and defeat a growing number of strategic adversaries, the United States will be unable to maintain its status of global leader- ship. The creation of effective defenses against ballistic mis- sile attack remains central to this task.

Tech exists for Kinetic Energy Systems

Pfaltzgraff 8 – Dr. Robert L. Pfaltzgraff jr., President, the Institute for Foreign Policy Analysis and Shelby Cullom Davis Professor of International Security Studies, The Fletcher School of Law and Diplomacy, Tufts University, December 15, 2008, “Space And U.S. Security A Net Assessment,” The Institute for Foreign Policy Analysis,http://www.ifpa.org/pdf/Space\_and\_U\_S\_Security\_Net\_Assessment\_Final\_Dec15\_08.pdf

Over a decade ago, the United States had developed technology for light-weight propulsion units, sensors, computers, and other components of an advanced kill vehicle. This concept, *Brilliant Pebbles*, consisted of a constellation of about 1000 satellites that combined its own early-warning and tracking capability with high maneuverability to engage attacking ballistic missiles in all phases of their flight trajectory. Each pebble was designed to identify the nature of the attack, which might include up to 200 ballistic missiles; and since it knew its own location and that of all other pebbles, each could calculate an optimum attack strategy from its own perspective and execute an intercept maneuver, while simultaneously informing the other pebbles of its action. This operational concept survived numerous scientific and engineering peer reviews in the 1989-90 time period, including by some groups that were hostile to the idea of missile defense in general, and space- based defenses in particular. Still, because of persistent policy preferences, the opposition eventually gained the upper hand politically, and the program which had been formally approved by the Pentagon’s acquisition authorities was curtailed by Congress in 1991 and 1992 and then cancelled by the Clinton administration, which opposed space-based missile defense and sought to preserve intact the ABM Treaty.50 Thus, in a very real sense, political decisions overrode technological feasibility.

Although there has been no formal program to develop the key technologies further, major advances in the commercial, civil and other defense sectors over the past decade will now permit even lighter mass, lower cost, and higher performance space-based interceptors than would have been achieved by the 1990-era *Brilliant Pebbles* technology base. Thus, lighter weight and smarter components can now give to a kinetic energy inter- ceptor greater acceleration/velocity making possible boost-phase intercept of even short- and medium-range ballistic missiles. If the necessary investments are made to upgrade *Brilliant Pebbles*-type technology for the twenty-first century, boost-phase intercept from space will also be feasible against high acceleration ICBMs that would have exceeded the capabilities of the 1990 *Brilliant Pebbles*.51

## Need Funding

Need more funding fur SMD

Spring 5-3-11 – Baker Spring, F.M. Kirby Research Fellow in National Security Policy at The Heritage Foundation, “Sixteen Steps to Comprehensive Missile Defense: What the FY 2012 Budget Should Fund,” The Heritage Foundation, http://www.heritage.org/Research/Reports/2011/05/Sixteen-Steps-to-Comprehensive-Missile-Defense-What-the-FY-2012-Budget-Should-Fund

The Obama Administration made large-scale cuts to the missile defense program in fiscal year (FY) 2010, and its proposed budgets for FY 2011 and FY 2012 will not make up the lost ground. Similarly, the Administration has cancelled or sharply curtailed promising missile defense programs and joint projects with U.S. allies, including the Airborne Laser (ABL) and the “third site” missile defense system in Poland and the Czech Republic. Furthermore, the President signed and the Senate consented to ratification of the New Strategic Arms Reduction Treaty (New START) with Russia, which imposes sweeping restrictions on U.S. missile defense options. These changes in policy and programs indicate that the Obama Administration is seriously misreading the situation, both domestically and internationally. It is attempting to rely on Cold War deterrence, which is inadequate in a world of proliferation of missile technology and weapons of mass destruction.

Congress needs to put the overall missile defense program back on track and enact into law a U.S. “protect and defend strategy” to replace the outdated Cold War strategy of strategic deterrence. To these ends, Congress should increase overall funding for missile defense, restore a number of missile defense programs, and make significant changes to missile defense policy in the National Defense Authorization Act for FY 2012.

Have the tech- more funding improves it

Lambakis 7 – Steven Lambakis, pHd, national security and international affairs analyst specializing in space power and policy studies for National Institute for Public policy, March 2007, “Leveraging Space to Improve Missile Defense” High Frontier, The Journal for Space & Missile professionals, Volume 3, Number 2

Optimal orbits for engaging missiles from space would de- pend on the satellites’ inclinations, which bound the orbital en- gagement zone between latitudes north and south of the equator at similar distances. With weapons on-orbit, missile defenders would have a capability to engage intercontinental- to medium- range ballistic missiles launched from any region within that zone. Intercepts in the boost and midcourse of that missile’s flight could be possible. Essential work to demonstrate the fea- sibility of critical space-based interceptor functions has already been done (as part of the Brilliant Pebbles development program in the 1980s and early 1990s). The Missile Defense Agency (MDA), should it receive the support of the administration and Congress, could continue development efforts to perfect com- mand and control of space-based assets and long-term storage of propellant, among other things.

## Boost Phase

Boost phase is better laundry list- infrared signature

Aubin and Streland 2k- Dr. Stephen P. Aubin and Major Arnold Streland, phd. Director strategy execution at Raytheon and Col Arnold H. Streland, Commander, TSAT Space Group, MILSATCOM Systems Wing, Space and Missile Systems Center, October 2000 , “The Space-Based Laser Integrated Flight Experiment: Global Missile Defense in the Boost Phase”, Team SBL-IFX, http://www.wslfweb.org/docs/SBLWP.pdf

There are a number of advantages to intercepting an aggressor’s missile in the boost phase. The first is that the missile is most vulnerable during its launch. There is a large infrared signature, thanks to the burning fuel; the missile maintains a slowly changing attitude, making it easier to track; and the rocket body is relatively fragile and under great aerodynamic stress. Additionally, because the warhead has not separated from the launcher, there is a relatively large lethal-hit area when attempting to destroy the missile. The boost phase also occurs before any decoys or countermeasures can be initiated by an aggressor. One of the greatest challenges for hit-to-kill kinetic interceptors attempting to destroy warheads in the midcourse or descent phases is the ability to distinguish between the warheads and the decoys. In the descent phase, advanced warheads may also maneuver and be less predictable in terms of their flight paths. The combination of using directed energy intercept in the boost phase and kinetic intercept in the midcourse and terminal phases would increase the likelihood of successfully defeating countermeasures aimed at thwarting missile defense systems. In fact, countermeasures, like deploying decoys and maneuvering outside of the projected target track, which may be effective against kinetic interceptors, are ineffective against directed energy attack during boost phase. Likewise, countermeasures that are aimed at reducing the effectiveness of directed energy systems, like hardening of missiles to prevent laser penetration and fast burn to shorten the boost phase, are ineffective against mid-course and terminal phase kinetic interceptors. Another key advantage and potential deterrent to a would-be aggressor is the fact that ballistic missiles destroyed early in the boost phase usually explode and fall over the aggressor’s own territory, forcing the aggressor to confront the risk of nuclear, chemical or biological debris. The greatest challenge of boost phase intercept is the speed required to catch an aggressor’s missile in the first few minutes of flight. Although the United States has the capability to detect missile launches very early in flight, the speed limitations of interceptor missiles being developed make it unlikely that they could destroy the aggressor missile before its launcher burns out. This challenge, however, can be overcome by using directed energy, which moves at the speed of light ­ 186,000 miles per second (or 300,000 kilometers per second). To illustrate this advantage, consider the speed of the ground-based interceptor being developed for National Missile Defense, which is in the vicinity of 7 kilometers per second. (This is faster than today’s theater interceptors under development, which were capped at 5.5 kilometers per second in the September 1997 Agreed Statement to the ABM Treaty of 1972.) Even if the interceptor were positioned close enough to achieve intercept, it is a very challenging task and not nearly as efficient as directed energy, which travels about 43,000 times faster than the most capable groundbased interceptors. Given its speed, directed energy should be seen as complementing the critical role kinetic interceptors play in the mid-course and terminal phases of a missile attack. Both the Airborne Laser, which is being developed to address short- and medium-range theater ballistic missiles, and the Space-Based Laser, which is being designed to counter ICBMs deep in the aggressor’s 4 territory, can detect and intercept missiles almost instantaneously. Each works by acquiring the infrared signature of the boosting missile, tracking its course with a low-power laser, and then focusing a high-power laser on the body of the boosting missile. The heat of the laser weakens the missile’s skin, and the internal pressures and supersonic aerodynamic flight stresses cause it to explode.

Not focused on effective programs now

No funding for boost phase missile defense now

No funding for SBI

Spring 10- Baker Spring is the F.M. Kirby Research Fellow in National Security Policy at The Heritage Foundation. Spring specializes in examining the threat of ballistic missiles from Third World countries, April 8, 2010, “The Obama Administration's Ballistic Missile Defense Program: Treading Water in Shark-Infested Seas”, The Heritage Foundation, http://www.heritage.org/research/reports/2010/04/the-obama-administrations-ballistic-missile-defense-program-treading-water-in-shark-infested-seas#\_ftnref7

No funding for boost-phase missile defenses. The President's budget provides no funding for major boost-phase missile defense programs in FY 2011. In 2009, the Airborne Laser was scaled back, and the Kinetic Energy Interceptor was terminated. In FY 2009, the account for boost-phase missile defenses received $384 million.

No funding for the Multiple Kill Vehicle program. The Multiple Kill Vehicle program was designed to create smaller and lighter kill vehicles so that an interceptor booster could carry more than one kill vehicle. Defense Secretary Robert Gates announced in 2009 that the Department of Defense was terminating this program. Accordingly, the FY 2011 missile defense budget would provide no funding for the program.

Minimal funding for space activities and no funding for space-based interceptors. The FY 2011 budget allocates just $11 million to space activities for missile defense, compared with $12 million in FY 2010 and $23 million in FY 2009. The funds will primarily support space-based sensor and data collection activities of the Missile Defense Space Experimentation Center (MDSEC). Additionally, the FY 2011 budget will provide $67 million for the Precision Tracking Space System (PTSS), a new satellite system to track ballistic missiles. The PTSS will build on lessons learned from the two Space Tracking and Surveillance System (STSS) demonstration satellites. The STSS program will receive $113 million in FY 2011, but its funding is winding down. It received $210 million in FY 2009 and $162 million in FY 2010. The five-year STSS program includes a demonstration project for feeding satellite data to the Aegis fire control system via the missile defense command and control system to permit remote engagement by the Aegis system. This is critically important to the future success of the Aegis system. However, failure to allocate any money to develop space-based interceptors is nothing short of self-defeating.

Need SBI for boost phase interception

Toughest stage

Surface based systems range limited

Impossible against Russia and China

Kleinberg 11- Howard Kleinberg is a member of the graduate faculty of the Department of Public & International Affairs at University of North Carolina Wilmington. The author has a Master of Arts in the Security Studies Program from Georgetown University, Washington, D.C. and a Bachelor of Science in Electrical Engineering from the University of Toronto, Canada. He also has 25 years of experience in the U.S. Defense Sector, the Space Industry, and software engineering, March 1, 2011, “A global missile defense 'network': terrestrial High-Energy lasers and Aerospace mirrors part 1 of 2.” Fires , http://www.highbeam.com/doc/1G1-251954702.html

However, the boost phase is also the toughest phase in which to actually reach it. According to information provided in 2004 by the Missile Defense Agency, a missile's boost phase only lasts between 180- 300 seconds. Any boost-phase missile-defense system must detect, decide, launch and fly out to intercept a boosting ICBM within that time-frame, severely curtailing the effective range of any boostphase interceptor missile. Like its target, a boost-phase interceptor missile must also leave the ground, climb and accelerate to catch its similarly-climbing-and-accelerating target. As a consequence, surface-based boost-phase missile defense is severely range-limited. This is only achievable for defense against missiles from smaller, geographically-accessible states such as North Korea and to, a lesser extent, Iran. Boost-phase interceptions are impossible in most cases against Russia and China, which boast much greater interior distances from their borders to their missile launch areas, i.e., much greater strategic depth. Worst of all, according to the 2000 International Institute for Strategic Studies' Adelphi Paper, "Ballistic Missile Defense and Strategic Stability," by Dean A. Wilkening, these very same states also possess the most numerous, and dangerous, of the ICBMs that could be aimed at the U.S.

Why boost phase is key

Have multiple opportunities

Can reach each stage

Easier to detect

Destroy before counter-measures are deployed

Could land on own country

Counter-measures make it easier to intercept later and make missile less effective

Pfaltzgraff 9- Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, April 3, 2009, “Boost Phase Missile Defense: Present Challenges, Future Prospects”, http://www.ifpa.org/pdf/Pfaltzgraff\_Boost-Phase.Missile.Defense\_Capitol.Hill-Marshall.Inst\_3.April.09.pdf

Let me first address the question of why it matters whether we have a boost-phase defense. There are several inherent advantages to boost-ascent-phase missile defense. Most important is the fact that our missile defense architecture should be designed to give multiple intercept opportunities once a missile is launched. We should be capable of intercepting and destroying ballistic missiles and warheads in each of the three phases of their flight – boost, midcourse, and terminal. If we have multiple intercept opportunities, the burden placed on any one of these opportunities is less than would be the case if we had only one intercept opportunity. We need to be able to intercept early and often. The layered concept for missile defense applies in other security arenas as well. For example, we should strive for layered defense if we are planning homeland security. Only one of our layers has to be successful to destroy a missile or to thwart a terrorist. To penetrate such defenses, the missile or the terrorist would need to be successful in penetrating all of the layers. So you can see conceptually why logically layered defense offer maximum opportunities to deny missiles, warheads, or terrorists access to their targets. Layered defenses in the missile defense arena begin in boost phase.

Boost-phase missile defense has another inherent advantage. The missile is relatively slow moving, not having yet achieved full acceleration. At this time it emits bright exhaust gases that are relatively easy for sensors to detect and track. Interception during the boost phase has the advantage of destroying the missile before it disperses its payload, which may consist of one or more warheads and possibly countermeasures such as decoys designed to confuse the interceptors. Intercepting a missile in boost phase has the additional advantage that the debris, including warheads, may, depending on how early interdiction occurs, fall on the country launching the missile. This is a situation that could have a substantial deterrent effect on the potential launcher of a missile if its leadership must face the likelihood of inflicting substantial damage on its own territory and people.

Furthermore, let us assume for a moment that the missile has been hardened in order to reduce the possibility of destruction in the boost phase. The result is an increase in the missile’s weight, possibly easing the task of later interception. The corresponding reduction of payload has the added benefit of diminishing the missile’s range and/or its destructive potential.

Boost MD solves EMP and ASATs

Emp can only be in boost phase

Intercept verticle ASATs

Pfaltzgraff 9- Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, April 3, 2009, “Boost Phase Missile Defense: Present Challenges, Future Prospects”, http://www.ifpa.org/pdf/Pfaltzgraff\_Boost-Phase.Missile.Defense\_Capitol.Hill-Marshall.Inst\_3.April.09.pdf

Finally, let us assume that one of the most devastating asymmetrical strategies that could be used against the United States would come in the form of a vertical launch missile carrying a warhead designed to detonate at an altitude of, say, between 40 and 400 kilometers above the earth’s surface. As the 2004 EMP Commission Report points out an EMP attack would constitute a highly successful asymmetric strategy against a society as heavily dependent as the United States on electronics, energy, telecommunications networks, financial systems, transportation systems, the movement of inventories in its manufacturing sector, and food processing and distribution capabilities. The launching missile would obviously have to be intercepted in boost phase because that is the only phase that it would have. Similarly, if we wanted to prevent an attack by a vertical launch missile such as what China used in its January 2007 ASAT tests, the intercept would need to come in boost phase.

## Mandates

Solvency advocate?

Demonstrate feasibility in 3 years

All phases of flight

Special tech taskforce

Fund through Defense Advanced Research project agency

Team from government and industry with proper funds

Cost to develop demonstration/limited test bed- 3-5 billion

Handed off to air force in 3-5 years

Pebbles have multiple opportunities to kill in all 3 stages

Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 129

Because space-based defenses offer the widest coverage and largest number of intercept opportunities, and little if anything has been done to take advantage of space defense technologies that were mature 15 years ago, a new initiative is required to bring that technology and its potential up to date. We recommend a streamlined technology-limited development program based on the Brilliant Pebbles program to demonstrate within three years the feasibility of a constellation of space-based interceptors to intercept ballistic missiles in all phases of flight – boost, midcourse, and terminal. To avoid conflicts with existing acquisition programs focused on ground- and sea-based defenses while moving forward as rapidly as possible, this effort should be undertaken by a special task force of competent technical personnel experienced in developing pioneering technology. Consequently, the United States should: Fund DARPA[Defense Advanced Research Projects Agency], which specializes in the innovation of defense systems through advanced technology, to assemble a small team charged with rapidly reviving and deploying a modern space-based kinetic-energy interceptor system in the manner of past successful programs such as the development of the first ICBM and the Polaris missile. Of particular importance is a small, empowered, technically competent management and engineering team from government and industry, fully supported with needed funds. Building on the Brilliant Pebbles technologies created in the late 1980s and early 1990s as well as advanced technologies produced since then in both the military and commercial sectors, the DARPA team should develop and rigorously test within three years a space-based system to perform boost, midcourse, and terminal interception tests against ballistic missiles of several ranges. The anticipated cost of this three-year effort, which could leave in place a space test bed with limited intercept capability, is $3 billion to $5 billion. Direct the Air Force Space Command to work with DARPA to develop the operational concept for a constellation of space-based interceptors, with an anticipated handoff to the Air Force in three to five years of an evolving capability that can be integrated into U.S. Strategic Command’ s global architecture. Using an event-driven procurement strategy deploy a Brilliant Pebbles twenty-first century space-defense system with the goal of an initial capability in 2012. Because of the number that would be deployed, Brilliant Pebbles would have multiple opportunities for interception, increasing chances of a successful kill in either the boost or midcourse phase, or even in the early terminal phase. These characteristics stand in sharp contrast to the GMD ground-based interceptors which, in the limited numbers presently planned, may not provide more than one intercept opportunity. Moreover, Brilliant Pebbles interceptors are small (1.4-2.3 kilograms and approximately the size of a watermelon), making them difficult to detect and thus target; they also contain an inherent self-defense capability that further adds to their survivability. Brilliant Pebbles was approximately midway through engineering and manufacturing development before it was cancelled, suggesting that with the needed political will, an updated system could be developed and deployed in a timely fashion. For example, based on the fully approved Defense Acquisition Board plan from 1991, 1,000 Brilliant Pebbles interceptors could be developed, tested, deployed, and operated for 20 years in a low-to-moderate risk eventdriven acquisition program for $11 billion in 1989 dollars, or $19.1 billion in inflation-adjusted 2008 dollars.

Possible testing to show we have the tech

Make a test bed to show it works

Could be expanded

5 year timeframe for initial operations

Old tech was used for a program by Motorola- we can learn from that to make a new program

Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 28

One feasible option for testing and initial deployment of a revived space-based interceptor system based on Brilliant Pebbles would be to deploy approximately 40 to 120 interceptors for a space-system test bed analogous to the ground- and sea-based test beds. After demonstrating feasibility by testing against missiles of all ranges in all possible phases of their flight, this test bed would have a limited capability and could be expanded to become part of a fully capable defensive constellation.

In 1991 initial operations were expected to be feasible in approximately five years; however at that time there was an in-place acquisition program with two competing contractor teams. An appropriate Brilliant Pebbles team could be reconstituted and meet an approximate five-year target date for initial operations. Motorola used commercially available technology to build and begin operating its 66- satellite constellation Iridium communications system in roughly five years for approximately $5 billion. Iridium, now used by the Pentagon for communications to remote locations, exploited many of the technologies, operational concepts, and acquisition management approaches that had been planned for Brilliant Pebbles before it was cancelled in 1993. Consequently, the operational issues demonstrated by the Iridium experience would be valuable in reconstituting a viable Brilliant Pebbles acquisition program, provided personnel with that experience were included on the team.

Use prototypes

Bmd is a public good/private sector fails

coalitions deter war

states wont attack if they know the international community could block attacks

we should start with prototypes and gauge effectiveness before expanding

privatizing fails for national security purposes – focus on near term

Frederick 9- Lt Col Lorinda A. Frederick, USAF, Master of Airpower Art and Science, School of Advanced Air and Space Studies, Air & Space Power Journal Fall 2009 – Volume XXIII, No. 3, No. AFRP 10-1, <http://www.airpower.au.af.mil/airchronicles/apj/apj09/fal09/frederick.html#frederick>

Cooperation on missile defense initiatives could increase global stability. By banding together in coalitions, countries can deter war by repelling an attack against any member.52 States and rogue elements will not be able to strike surreptitiously if they know that the international community could quickly discern the origin of any launch and compute potential impact points. Attempts by a rogue element to destabilize the region through the attribution of attacks to a state may initially promote the rogue elements own agenda. However, data provided by missile defense and other sensors can refute such claims. The shared international ability to identify launch and impact points might deter states and rogue elements from launching in the first place. The more nations cooperate with each other, the more stable the world becomes. Policy makers need to invest in the development of many different capabilities, including SBMD, to negate missiles in their boost phase and use the information gleaned from these developments to inform decisions. One approach involves bringing a system to the prototype stage for testing and accurately gauging its performance. This approach could let the United States invest in only a limited number of prototypes, thus deferring large-scale production to allow further research, development, and testing. These efforts could decrease the risk of failure during production and deployment.53 When the need arises, the United States should capitalize on preexisting prototypes as long as the industrial base could support rapid production. By funding R&D for SBMD, the United States would ensure the viability of these technologies. The DOD cannot expect developments in commercial industry to be available for national security purposes. Competitive pressures force industry to fund near-term R&D programs and choose near-term survival over long-term possibilities.54 Applied research into SBMD technologies would allow the United States to gain more knowledge about boost-phase defenses. America will get as much R&D in SBMD technologies as it is willing to fund.

MDA collaborates with Air Force

Work to integrate with Aegis

O’Reilly 10- Lieutenant General Patrick O’Reilly is Director of the Missile Defense Agency (MDA), April 15, 2010, REPORT ON THE BALLISTIC MISSILE DE- FENSE REVIEW AND THE FISCAL YEAR 2011 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR MISSILE DEFENSE PROGRAMS, HEARING BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES OF THE COMMITTEE ON ARMED SERVICES HOUSE OF REPRESENTATIVES, <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:58294.pdf>, p. 98

MDA is collaborating with key Air Force stakeholders including Air Force Space Command, the Space and Missile Systems Center and the appropriate members of the Air Staff on specific roles and responsibilities. MDA[Missile Defense Agency] is collaborating with the Air Force to establish a Service Cell within the PTSS[Precision Tracking Space System] Hybrid Program Office which will ensure the PTSS operations and data management systems are consistent with Air Force initiatives. MDA is also teaming with critical technical expertise within the Navy and its Aegis cadre for integration of the PTSS into Aegis Combat System fire control design and development. Acting as a pathfinder, STSS[Satellite Tracking Surveillance System] will characterize the challenges of closing the fire control loop with Aegis BMD, addressing problems such as latencies, interfaces, accuracies, and biases. Using the same Navy expertise, PTSS will build upon the STSS launch-on knowledge, to continue with an engage- on campaign, expanding the battlespace for operational ships along with larger defended areas.

Normal Means for Space programs in the MDA

Stable baseline to minimize risks

Develop a prototype

Contract out the program

Industry engagement in building of prototype

Set baseline up front to “discourage future growth without operational necessity”

Want to use already developed tech to minimize risk

Want to avoid developing new tech if possible

O’Reilly 10- Lieutenant General Patrick O’Reilly is Director of the Missile Defense Agency (MDA), April 15, 2010, REPORT ON THE BALLISTIC MISSILE DE- FENSE REVIEW AND THE FISCAL YEAR 2011 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR MISSILE DEFENSE PROGRAMS, HEARING BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES OF THE COMMITTEE ON ARMED SERVICES HOUSE OF REPRESENTATIVES, <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:58294.pdf>, p. 97-98

Mr. LANGEVIN. To enhance the effectiveness of all missile defense systems, and to reduce reliance on land and sea-based sensors, MDA has created a new program this year, Precision Tracking Space System or PTSS. General O’Reilly, given the ongoing challenges in space acquisition, can you assure the committee that the PTSS program can be delivered in a timely way at a reasonable cost?

General O’REILLY. Yes. Challenges and problems associated with past satellite development programs indicate that a stable baseline and risk reduction is necessary to improving development timelines. Developing prototypes prior to making production decisions will ensure that proper Technology Readiness Levels (TRL) are achieved, thereby improving our development timelines. The PTSS acquisition strategy is to develop a prototype system with Johns Hopkins University’s Applied Physics Laboratory before awarding production development contracts to industry. Additionally, we will award contracts to several industry participants during concept development and exploration to insure the prototype can be readily produced by industry. Industry engagement during the prototyping phase will greatly improve the level of understanding by the contractors and reduce risk for PTSS production. This partnership between industry and the scientific community will ensure our understanding of requirements before we award production development contracts. The MDA also intends to leverage heritage, high TRL space system components for the PTSS. This approach focuses on component reuse and integration and minimizes the need for new technology development and custom design which will drive costs up and increase development timelines.

Mr. LANGEVIN. What actions is MDA pursing to ensure the program establishes a realistic baseline and only uses mature technology? What technology and other lessons learned is the PTSS program taking from the STSS demonstration satellites? Finally, can you explain why MDA is planning to acquire a satellite capability when the Air Force has the primary expertise for space systems?

General O’REILLY. Challenges associated with past satellite development programs indicate that a stable baseline is necessary to improve development timelines. To that end, MDA will establish the requirements baseline upfront and early and discourage future growth without operational necessity. MDA also intends to leverage heritage, high Technology Readiness Level components and subsystems for the PTSS. This approach focuses on component reuse and integration and minimizes the need for new technology development that may drive costs up and increase development timelines.

Advantages of KEI over ground based systems

Boost phase is best time to attack- most vulnerable and easiest to identify

Only way to attack at boost phase is with space

KEI can destroy in boost phase

Each pebble can destroy 10 warheads

Baucom 9- Donald R. Baucom is The Missile Defense Agency’s historian and he directed the Air Power Research Institute at Maxwell AFB. His writings on the SDI won the Organization of American Historians’ Leopold Prize in History. Appendix in Report chaired by Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, published by Institute for Foreign policy task force in 2009, most recently published in the Journal of Social, Political and Economic Studies, Volume 29, Number 2, September 2004, 145-190, Appendix D: “The Rise and Fall of Brilliant Pebbles” in the report “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf) p. D16

A ballistic missile is more vulnerable in its propulsion or boost phase then in any subsequent part of its trajectory. At the same time, its identity is most difficult to conceal. These circumstances immediately suggest an early intercept system as an ideal solution to the defense problem. Unfortunately, enemy missiles are relatively inaccessible during this phase. So Far, the only promising defense system concept has been a space based or satellite borne interceptor. Such a system requires many thousands of interceptors in space, but at a given instant only a small fraction will be in a position to attack. The economic feasibility of such systems is heavily dependent upon equipment reliability and upon enemy countermeasures.3

The remarks about economic feasibility should be borne in mind, as they will surface prominently later in this history of Brilliant Pebbles (BP), a space-based, kinetic kill interceptor that was part of President Ronald Reagan’s Strategic Defense Initiative (SDI) program. During its brief life span, Brilliant Pebbles became the central element of the SDI program. From their orbits around the earth, BP interceptors were to be capable of destroying Soviet ICBMs during their boost phase, eliminating their multiple warheads and decoys before these could be dispersed. In this way, a single Brilliant Pebbles interceptor could destroy as many as ten Soviet warheads. This pivotal role makes the BP story crucial to the broader history of the SDI program.

Why Space is better than ground

Already in space so don’t have to climb up

Being in a vacuum makes it easier to target missiles accurately

Tests indicate can intercept in boost stage

Caravan 3- Gregory Canavan works in the Physics Division Office of the Los Alamos National Laboratory, Ph.D. in Applied Science, 2003, “Missile Defense for the 21st Century”, Heritage Foundation Ballistic Missile Defense Technical Studies Series, http://www.missilethreat.com/repository/doclib/20030000-Heritage-canavan.pdf

Space-based interceptors can survivably overfly threat launch areas and engage missiles in the boost phase; thus, they are not subject to the azimuth and range limitations that restrict surface-based interceptors. The SBIs are already in space; the missiles have to climb a large potential well to reach their altitude, rather than the interceptor having to climb one to reach the missile, as surface-based systems do. Moreover, as the SBIs are in the vacuum of space rather than in the atmosphere, they can orient their thrust in the optimal direction for intercept rather than facing the dynamic pressure and erosion considerations that limit ground-based systems or taking the drag losses associated with accelerating through the dense atmosphere.

GPALS tests demonstrated that on-board sensors and processing could support the response times required for boost-phase intercepts from space, and the analyses above indicate that their economics should be favorable in that role. Their main disadvantage is that at any given time, most of the SBIs are somewhere else in their orbit. Thus, for launches from small areas such as rogues, SBIs are penalized by their absenteeism, which is reflected in reduced effective performance and increased cost. However, if the launch area is large enough, or if there are enough geographically dispersed threats to require global coverage, absenteeism turns to the BPs' advantage, because they then provide global defenses at no additional cost. That suggests a progression from surface- to space-based defenses as the number and size of launch areas grows and the number and speed of missiles increases.

About kinetic energy SBMD

Hit at early stage

Already have a lot of the tech from programs in the 1990’s

A lot of “pebbles” working together

Many studies in late 1980s were done showing it is feasible

Easy to replace, low cost, and difficult to target

Provide many opportunities to hit, in contrast to current defense

Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 27-28

Space-based Kinetic Energy Missile Defense A space-based KEI is designed to hit a ballistic missile in its boost or ascent phase, when the warhead(s) has not yet separated from the missile and is most vulnerable. It is also capable of midcourse and high-terminal phase intercepts. Kinetic kill vehicles would be placed in low-earth orbit, where they would remain until a hostile missile launch was detected. For intercepts in the boost or terminal phases, a kinetic kill vehicle would accelerate out of orbit toward the missile which would be destroyed by direct impact. Midcourse intercepts would occur in space.

By the early 1990s, the United States had developed technology for lightweight propulsion units, sensors, computers, and other components of an advanced kill vehicle. This concept, Brilliant Pebbles, consisted of a constellation of about 1,000 interceptors that combined their own early-warning and tracking capability with high maneuverability to engage attacking ballistic missiles in all phases of their flight trajectory. Each interceptor, or “pebble,” was designed to identi- fy the nature of the attack, which might include up to 200 ballistic missile warheads, based on a defense that included 1,000 “brilliant pebbles;” and since it knew its own location and that of all other pebbles, each could calculate an optimum attack strategy from its own perspective and execute an intercept maneuver, while simultaneously informing the other pebbles of its action. This operational concept enabled a robustly viable, testable, operational capability that survived numerous scientific and engineering peer reviews in the 1989-90 time period, including by some groups that were hostile to the idea of missile defense in general, and spacebased defenses in particular. Still, because of persistent policy preferences, the opposition eventually gained the upper hand politically, and the program, which had been formally approved by the Pentagon’s acquisition authorities, was curtailed by Congress in 1991 and 1992 and then cancelled by the Clinton administration.14

But the technology was clearly established, supporting the Pentagon’s approved acquisition plan that each of the pebbles would operate autonomously because each carried the equivalent of a Cray-1 computer and could perform its own calculations for trajectory and targeting analysis. Each also had its own navigation sensors, allowing it to determine its location and the location of its neighbors – as well as to detect and track the target ballistic missiles and calculate a good approximation of what its neighbors saw.15 These pebbles would act as sensor platforms until all or part of the constellation was authorized to intercept hostile missiles. In fact, their infrared sensors provided the warning and tracking capability needed to alert the Brilliant Pebbles constellation, enabling it to intercept ballistic missiles in the boost and subsequent phases of flight. The constellation would provide a redundant and, for some applications, superior capability to the geosynchronous Defense Support Program satellites used since the early 1970s as a key element of the U.S. Early Warning and Tactical Assessment system. Their small size, meanwhile, made them difficult to target, while their relatively low cost made them easy to replace.

The autonomy of Brilliant Pebbles interceptors in detecting launch and undertaking interception complicated the use of countermeasures against their command and control. And because of the number of interceptors deployed in space, these defenses would have multiple opportunities for interception, thus increasing their chances of a successful intercept in either the boost or midcourse phase, or even high in the Earth’s atmosphere during reentry in the terminal phase. These characteristics stand in contrast to the current GMD interceptors, which may not provide more than one independent intercept opportunity.

Why BP is uniquely important

- Pebble can attack both strategic and ballistic missiles

- BP provides protection

- more autonomous and doesn’t have to rely on other systems

Baucom 9- Donald R. Baucom is The Missile Defense Agency’s historian and he directed the Air Power Research Institute at Maxwell AFB. His writings on the SDI won the Organization of American Historians’ Leopold Prize in History. Appendix in Report chaired by Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, published by Institute for Foreign policy task force in 2009, most recently published in the Journal of Social, Political and Economic Studies, Volume 29, Number 2, September 2004, 145-190, Appendix D: “The Rise and Fall of Brilliant Pebbles” in the report “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf) p. D29

As fully articulated in SDIO’s May 1991 report to Congress, the new GPALS architecture would include four major components: a ground-based national missile defense system to protect the United States, a ground- and sea-based system to defend deployed U.S. forces and the forces and peoples of American allies, a space-based system (Brilliant Pebbles) that could protect any point on the globe against a limited missile attack, and a battle management/command and control system that integrated the other three components into a coherent, synergistic system. Of the three defensive components, Brilliant Pebbles was the most important, since it “would provide global detection of an attack” and was to be capable of destroying both strategic and theater ballistic missiles, provided the latter traveled a distance that exceeded six hundred kilometers. A later fact sheet would put the case for BP as follows:

The role of Brilliant Pebbles is vital to the GPALS mission. BP will provide global protection against ballistic missiles. While on orbit, a BP will be able to detect a hostile missile launch, decide whether or not to engage the target, and destroy the target by colliding with it. Once given intercept authority from man-in-the-loop, BP will do all of this autonomously and will communicate with other BPs to coordinate which Pebble will engage which target. The Brilliant Pebbles program represents more than an alternate design for a space-based interceptor. First, BP is a different architectural concept for the space-based segment and incorporates distributed operations, autonomy, and reduced dependence on other system operations.56 This was the state of the GPALS architecture as members of Congress began their deliberations on the authorization and appropriation bills for fiscal year 1992. As they did, images of Gulf War missile attacks were still fresh in their minds. Their efforts produced the Missile Defense Act (MDA) of 1991 that became law in November 1991.

Cool features of the 1990 pebbles

Destroy well over half of the weapons

Leave the rest to ground systems

Can attack in all phases of missile defense

Can get medium and short range missiles as well

Fixed price contracts

Wood et. Al 9- Drs. Lowell Wood, Ed English, Lyn Pleasance and Arno Ledebuhr who principals in conducting the Brilliant Pebbles and Clementine programs contributed in writing the appendix. Report chaired by Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Appendix I: The Legacy of Brilliant Pebbles, Clementine, and Iridium for Future Space-Based Missile Defenses”, in the report “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. I62-64

Key 1990 Brilliant Pebble Features. The figure above lists the mass of the various components of the 1990-vintage LLNL version of a Brilliant Pebble, as incorporated into the Global Protection Against Limited Strikes (GPALS) architecture formally adopted by the Bush-41 administration. The objective of this space component of the GPALS architecture, which employed 1000 pebbles in low-earth orbit, was to provide high confidence7 in destroying a major percentage (well over half) of 200 warheads that might be abruptly launched from anywhere in the world at the United States or its overseas troops and allies (the remainder of the 200 warheads was assigned to ground-based elements of the layered GPALS architecture). This Brilliant Pebbles constellation, then expected to comprise a quarter of the total GPALS defensive system cost, was to be given multiple intercept opportunities against ballistic missiles in all phases of flight – boost, midcourse and high-endoatmospheric – making it a layered defense against even medium and short-range ballistic missiles world-wide.8 After the GPALS architecture was adopted, SDIO invited industry to compete to manage the Brilliant Pebbles Demonstration- Validation (DemVal) program intended to design for deployment a 1000 pebble constellation (with logistics costed to support replacing each pebble once during a 20- year period). Two teams were selected – ones led by Martin Marietta and another by an ad hoc TRW-Hughes co-captaincy – and SDIO proceeded to begin a competitive formal acquisition program. The two specific designs differed in detail, but not in substance, with the baseline LLNL concept summarized here. Both teams were confident that they could build an operational system within an $11 billion (FY 1989 dollars) 20-year total life-cycle cost estimate, approved by the DoD Cost Analysis Improvement Group (CAIG) as a part of the Defense Acquisition Board Milestone I reviews. Indeed, they offered firm, fixed-price contract proposals to deliver as-specified pebbles in earth orbit to the government, which were accepted.

## Feasibility

The plan breaks down the wisdom that missile defense tech is doomed

Pinkerton 01- James K., frequent columnist for fox news fellow at the New America foundation in Washington D.C. Former Columnist for Newsday He worked in the White House domestic policy offices of Presidents Ronald Reagan and George H.W. Bush and in the 1980, 1984, 1988 and 1992 presidential campaigns. In 2008 he served as a senior adviser to the Mike Huckabee for President Campaign, July 16, 2001, “Missile Defense Spinoffs from Outer Space”, http://www.newamerica.net/node/6152

Which is unfortunate, because the unfashionable science they champion has a way of proving itself. In the last few years it's become the conventional wisdom in Washington that missile defense technology is doomed, because, in the popular cliche, "You can't hit a bullet with a bullet." Well, the Pentagon did just that on Saturday night. A projectile, the so-called "kill vehicle," hit a dummy warhead when both were traveling at 4.5 miles per second. Not bad. And while missile defense has a long way to go, the test is a distant early warning to the establishment that the idea might work. As for the astronomers who have been reaping the huge benefits of SDI/NMD, they are not obligated to support missile defense as a form of gratitude for the technogoodies they have received. But as a group, speaking louder than the articulate but lonely voice of Jastrow, astronomers might speak up just a bit. After all, if missile defense technology is good enough for them to use in their stargazing, it might just be good enough to use in defending America.

## Aff Key

Missile Threat is on the rise now. China, North Korea, and Iran

Aubin and Streland 2k- Dr. Stephen P. Aubin and Major Arnold Streland, phd. Director strategy execution at Raytheon and Col Arnold H. Streland, Commander, TSAT Space Group, MILSATCOM Systems Wing, Space and Missile Systems Center, October 2000 , “The Space-Based Laser Integrated Flight Experiment: Global Missile Defense in the Boost Phase”, Team SBL-IFX, http://www.wslfweb.org/docs/SBLWP.pdf

Ballistic missiles have represented one of the greatest vulnerabilities for all the nations of the world ever since the Nazis first launched the V-2 rocket near the end of World War II. One of the tragic reminders of the real and increasing threat to U.S. forces deployed abroad was the death of 28 U.S. soldiers caused by a Scud missile that struck a barracks in Dhahran during the Gulf War. More than five decades after the V-2 first appeared and nearly a decade after the Gulf War, U.S. forward-deployed troops, allies, and even the U.S. mainland remain vulnerable to missile attack and the potential delivery of weapons of mass destruction. In his February 2000 testimony on the Worldwide Threat, CIA Director George Tenet said that the proliferation of weapons of mass destruction had “become even more stark and worrisome” than just a year before. “Transfers of enabling technologies to countries of proliferation concern have not abated,” he said. “Many states in the next ten years will find it easier to obtain weapons of mass destruction and the means to deliver them.”1 Tenet added that “the missile threat to the United States from states other than Russia and China is steadily emerging. The threat to US interests and forces overseas is here and now.” Tenet pointed out that, over the next 15 years, U.S. cities will face ICBM threats from a wider variety of nations, including North Korea, Iran, and possibly Iraq. He also expressed concern about the security of nuclear weapons and materials in Russia.2 In its unclassified version of its 1999 National Intelligence Estimate, the intelligence community reiterated that “the proliferation of medium-range ballistic missiles (MRBMs) – driven primarily by North Korean No Dong sales – has created an immediate, serious, and growing threat to US forces, interests and allies, and has significantly altered the strategic balances in the Middle East and Asia.”3 In South Asia, Pakistan and India are locked in a nuclear rivalry, and the intelligence community has assessed that both countries’ short-range and medium-range ballistic missiles may have nuclear roles.4 Foreign assistance has played a key role in the increasing proliferation of missile technology, with Russia, China, and North Korea as the principal suppliers. And, Tenet warns, the recipients of missile-related technology, such as Syria and Iraq, “may emerge in the next few years as suppliers.”5

Colonization adv. Uniqueness- missile defense programs obsolete built in cold war- military R&D down

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

Compounding the challenges from abroad is a weakening of the technological and industrial base on which American space power relies. Numerous reviews of U.S. space policy, programs, and budgets over the years have called for altering how space programs are budgeted and managed, changes in how space personnel are trained and the career paths available, and increased investment in research and technology. None of these concerns is new. Troubling signs of a weakening base for American space have been appar26ent for some time. The absence of a peer competitor and the sizeable lead in space capabilities from Cold War-era investments gave policy makers, the public, and even military leaders a false sense of security and reinforced the impression that U.S. leadership would go unchallenged with only minimal attention. Despite the national security importance of space, the United States has not put adequate resources into military space programs. Many of the approximately 100 U.S. national security satellites presently in orbit for military and surveillance operations are approaching obsolescence. Successor-generation models based on new and improved technologies frequently are delayed because they are over budget, behind schedule, and facing technical difficulties. The acquisition process for national security space programs is under severe strain, buffeted by excessive technical and schedule risk and unrealistic cost projections, leading the Defense Science Board to conclude that: “Government capabilities to lead and manage the acquisition process have seriously eroded.”27 The deleterious results of a broken acquisition system are apparent throughout the space sector. The Space-Based Infrared System (SBIRS)-High and the Space Tracking and Surveillance System (STSS) are two cases in point. While both are key parts of the missile defense system to be deployed by the United States, they have had to be restructured because of large cost overruns, schedule delays, and technical problems. For example, SBIRS-High, which is replacing the Defense Support Program (DSP) satellites and will provide rapid early warning and ballistic missile trajectory data, is now projected to cost approximately $10 billion, well over twice the amount of earlier estimates.28 Cost increases in excess of 25 percent during the last quarter of FY 2005 forced the Pentagon to recertify the program in December 2005. For FY 2009, DoD requested $2.3 billion for the program, though the Air Force is currently exploring a potential alternative or early replacement for SBIRS-High called 3GIRS.29

Military response key to stop assymetrical attack against U.S. space based assets- these develop future technologies

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

The United States must protect its critically important space systems, which are obvious targets for future adversaries who will seek to eliminate the edge those assets give our military forces. This asymmetric U.S. advantage is well known to even limited powers who confront U.S. interests, and they will inevitably strive to reduce that advantage if they seek to attack the United States – and today’s technology makes that possibility a serious concern. Perpetuating the well-known vulnerability of U.S. space assets is, therefore, an unacceptable security risk. The crucial importance of space was clearly highlighted in the early 1990s by the results of the first Gulf War – which the then-Air Force chief of staff, General Merrill McPeak, called the first “space war.”5 More recently, space-based assets, including communications and surveillance systems and sensors, again were essential to the rapid and decisive military victory in Iraq. Operation Iraqi Freedom would have been impossible to conduct with lightning speed and low casualties in the absence of space-based assets providing for unprecedented connectivity among internetted military systems.6 U.S. space systems are also playing a vital role in the current counter-insurgencies in Afghanistan and Iraq. The importance of space systems for the United States and its allies lies in their utter ubiquity throughout the spectrum of conflict at the tactical, operational, and strategic levels of war. The overriding importance of space to our national security was underscored in January 2001 by the “Report of the Commission to Assess United States National Security Space Management and Organization” (the Space Commission) headed by Donald Rumsfeld. How the United States develops space for civil, commercial, defense, and intelligence uses will have profound implications for national security in the next several decades. The commission emphasized that the United States has key national security interests in:

## Frees up NASA

Space Commercialization low now because NASA is focusing on the mundane aspects of space exploration the plan frees up space for NASA resources

Stern 10 - S. Alan Stern, NASA's former associate administrator in charge of science, is the chairman of the Commercial Spaceflight Federation's Suborbital Applications Researchers Group., May 17 “Let business handle routine spacefaring; NASA can handle the otherwordly missions” B, COMMENTARY; Pg. 3, http://www.washingtontimes.com/news/2010/may/17/let-business-handle-routine-sp/?page=all

NASA is spending too much of its precious budget on providing routine transport of astronauts to the space station, stymying progress on its more important task of sending astronauts to explore deep space. Fortunately, the administration has proposed a game-changing solution that uses cost-effective private industry to take on the more mundane aspects of human transportation to low-Earth orbit, freeing up needed funds to send astronauts to explore deep space. The administration's wise commercialization approach echoes an immensely successful path taken by NASA in the past. Consider: At the dawn of the space age, all satellites were built and launched by governments. But very early on, communications satellites were encouraged to go commercial. The result: a $100-plus billion spinoff industry that employs thousands of workers to build the satellites, their ground stations, launchers and associated command and control infrastructure, and launches more satellites annually than any other form of space flight. That has opened up NASA resources to do other things with the money saved. But equally importantly, the commercialization of space communications has also generated tens of thousands of direct and indirect private sector jobs, and a strong innovation cycle that's produced continuous improvement across the industry for more than four decades. In contrast, nearly 50 years after the first human flights to orbit by Yuri Gagarin and John Glenn, no commercial human spaceflight yet exists. Few in our parents' generation would have believed this, for at the outset of the space age, the commercialization of human transport to low-Earth orbit was widely expected. Remember the Pan Am shuttle in "2001: A Space Odyssey"? Why has the commercialization of human transport to low-earth orbit been stymied? Are the complexities of communication satellites and commercial human transport really so different? Not fundamentally. Are governments the only entities that can build human spacecraft? No, actually every human spacecraft ever built for NASA was built by private industry. Is the scope of the investment required for human spaceflight too large for private industry? No - large satellite constellations cost more than the commercial crew systems envisioned to take astronauts to and from low-Earth orbit. Of course, there are human lives at stake in space missions with crew, but commercial firms have lives at stake in industries as diverse as trucking, oil exploration, aviation and nuclear power. Why should space travel to destinations closer than most transcontinental airline flights be considered so different? In fact, there really is no fundamental reason that human orbital transport to low-Earth orbit must remain the practice only of governments a full half-century after it began. To the contrary, there are many reasons that the development of private, commercial human space flight vehicles in the United States is desirable for the nation. These include: \* Competition-driven innovation and price pressure that commercial practices foster can only make human space flight ever-more common, and U.S. leadership in this domain ever clearer. \* The spinoff development of related commercial companies supporting space tourism, orbital research stations and future applications pregnant with economic promise for aerospace industry and the United States. \* The generation of thousands of new, high-paying jobs across the U.S. to support commercial space lines. \* And the inherent robustness that comes with having a diverse suite of U.S. manned spaceflight systems to access space. It is only by freeing up NASA from routine human transport to low-Earth orbit that we can afford to once again see American astronauts exploring distant worlds. For this reason, if Congress doesn't adopt the administration's more economical, commercial crew to low-Earth orbit strategy, there is little chance we - rather than the Chinese, Russians and Indians - will be exploring worlds and making history in space in the future. What are we waiting for?

## Brilliant Pebbles Solvency

Specifically redoing brilliant pebbles incentivizes the development of new technologies

Cleave & Pfaltzgraff et al.09- Dr. William R. Van Cleave Professor Emeritus Department of Defense and Strategic Studies Missouri State University Dr. Robert L. Pfaltzgraff, Jr. Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, “Report Independent Working Group on Missile Defense,the Space Relationship,& the Twenty-First Century”, Institute for Foreign Policy Analysis, p. 39-40 http://www.ifpa.org/pdf/IWG2009.pdf

The Lunar Landing Program began in May 1961 with Kennedy’s daring declaration before a joint session of Congress to land a man on the moon before the end of the decade. With the possible exception of the Manhattan Project, technology had never been so brutally challenged. The world’s first satellite, Sputnik, launched in 1957 and visible to nearly every backyard in America, had flashed a warning that awakened the nation to its vulnerabilities to the Soviet race into space and its nuclear ICBM development efforts. By 1961 competition with the Union of Soviet Socialist Republics (USSR) had become vital to U.S. geopolitical interests.In April, Soviet cosmonaut Yuri Gagarin pulled ahead as the first to orbit the Earth. In May, astronaut Alan Shepard followed with the first U.S. suborbital flight, which was wildly celebrated by the American public. Kennedy took heed and responded three weeks later with his challenge, a stunningly bold move to put the nation ahead in space via the moon. Thus, the political dynamics were in place to drive technology toward a maximum outcome, i.e., taking a supportive role by letting technology determine the outcome. The now two-year-old National Aeronautics and Space Administration (NASA) took the charge with straight-line logic: how to get from here to there and back as efficiently and safely as possible. To achieve this, the Mercury missions were given new challenges, with Gemini following to pioneer new achievements as the bridge to the Apollo moon program. Each phase contributed synergistically to the other components also being worked on, so that the sum of the whole (the lunar landing mission) at any given time was greater than its parts. Spacecraft designs begat new spacecraft designs; guidance systems begat new guidance systems; living one day in space begat 14 days; and on and on into a myriad of thousands of components of human intellect and endeavor, and materiel designs and functions that were all pointed to one declared mission. There were tragic deaths, other dangerous moments, and discouraging failures along the way. There were also hundreds of useful spin-offs that helped to give the United States its commanding lead in technology. But the mission point was never lost and scores of heroes abounded, as on July 20, 1969 – eight years after Kennedy’s challenge – the Eagle landed at Tranquility Base. Of singular significance to this discussion is that throughout the Lunar Landing Program, each component and phase had its own place in the continuity and integrity of the overall mission. Remove one component and the entire mission would fail. Therefore, the program could not be arbitrarily cut in half or more in a Solomon-like gesture and still be expected to succeed. The significance is that the same applied to Brilliant Pebbles; it was cut and it died.2

\*\*\*Inherency\*\*\*

Other nations have WMDs yet Obama continues to cut Missile Defense Spending

Spring 5-3-11 – Baker Spring, F.M. Kirby Research Fellow in National Security Policy at The Heritage Foundation, “Sixteen Steps to Comprehensive Missile Defense: What the FY 2012 Budget Should Fund,” The Heritage Foundation, http://www.heritage.org/Research/Reports/2011/05/Sixteen-Steps-to-Comprehensive-Missile-Defense-What-the-FY-2012-Budget-Should-Fund

The Administration’s backsliding comes at a time when ballistic missile capabilities are expanding worldwide and are expected to continue expanding. For example, China has an estimated 170 to 180 nuclear-armed ballistic missiles and has deployed roughly 1,100 conventionally armed missiles opposite Taiwan.[6] These include the DF-21D, a missile that can hit large U.S. surface ships and has recently reached an “initial operational capability.”[7] Iran has missiles with a range of 1,200 miles, which can reach targets anywhere in the greater Middle East.[8] North Korea has roughly 1,000 ballistic missiles of varying ranges.[9] Russia is planning to buy 36 new intercontinental ballistic missiles (ICBMs) and two new missile submarines this year.[10]

We’re backing away from layered defense strategy now

Spring 5-3-11 – Baker Spring, F.M. Kirby Research Fellow in National Security Policy at The Heritage Foundation, “Sixteen Steps to Comprehensive Missile Defense: What the FY 2012 Budget Should Fund,” The Heritage Foundation, http://www.heritage.org/Research/Reports/2011/05/Sixteen-Steps-to-Comprehensive-Missile-Defense-What-the-FY-2012-Budget-Should-Fund

The Obama Administration policies toward the development and deployment of missile defense systems appear to deemphasize the U.S. commitment to a layered missile defense concept, which is designed to counter ballistic missiles in the boost and ascent, midcourse, and terminal phases of flight. A commitment to boost-phase capabilities is particularly lacking. The Administration backed away from boost-phase defenses by downgrading the Airborne Laser program and terminating the Kinetic Energy Interceptor (KEI) program in FY 2010. **It has yet to propose a program for pursuing space-based interceptors, the most effective option for a boost-phase missile defense.**

## Current Status

Current space programs

Was Space Tracking and Surveillance System, now is Precision Tracking Space system

STSS has satellites that track missile defense over the court of entire flight

PTSS is smaller and simpler

PTSS would be focused on areas where there are perceived threats

STSS was too complex, but PTSS is much less so

General advocates stopping STSS, moving forward with PTSS

O’Reilly 10- Lieutenant General Patrick O’Reilly is Director of the Missile Defense Agency (MDA), April 15, 2010, REPORT ON THE BALLISTIC MISSILE DE- FENSE REVIEW AND THE FISCAL YEAR 2011 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR MISSILE DEFENSE PROGRAMS, HEARING BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES OF THE COMMITTEE ON ARMED SERVICES HOUSE OF REPRESENTATIVES, <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:58294.pdf>, p. 25-26

Mr. SPRATT. One of the programs you do manage, I think, still is the Satellite Tracking Surveillance System (STSS), now to be called the PTSS. Before that it was the Space-Based Infrared System (SBIRs) Low, SBIRs High. Number one, what does PTSS do that STSS—how do you distinguish those two programs? Number two, what do they add to the quality and capability of the missile defense that we have for national defense?

General O’REILLY. Sir, the Space Tracking Surveillance System, the STSS, which was an outcome of the old SBIRs Low, we launched it this year, or actually September of last year, both satellites are on orbit. They are the first satellites that have the ability to track a missile over its entire flight. So they are doing groundbreaking work.

Actually, the PTSS is a smaller satellite. It is focused on certain parts of the Earth, and it will stare at certain parts of the Earth at a much simpler system than what the STSS had because we have found there are regions of the world where we are most worried about in missile defense.

And so one of the problems we have found in building satellites in the past is their complexity. So the PTSS system is actually significantly less complex than the STSS satellites we are flying today. We believe, again, it would be more affordable, and it is more—once you put a constellation up, you can quickly reconstitute it if you ever had a problem with a satellite on orbit. And it is an entire system. STSS is a satellite. The Precision Tracking Space System, PTSS, also incorporates the command and control system and the communications system all the way through a fire control system, such as Aegis or THAAD.

Mr. SPRATT. Do you still propose to go forward with deployment

of the STSS?

General O’REILLY. No, sir. The STSS is a fantastic capability we have today that is providing us design information. But we believe the PTSS, which is a smaller satellite, can, in fact, perform the mission that we need in missile defense.

Missile defense program goals

Obama is working on plans strengthen European missile defense

“defend homeland”

“defend allies from regional threats

New tech must be proven before it will be deployed

Fiscally sustainable

Flexible

International co-operation

LANGEVIN 10- HON. JAMES R. LANGEVIN, A REPRESENTATIVE FROM RHODE ISLAND, CHAIRMAN, SUB- COMMITTEE ON STRATEGIC FORCES, April 15, 2010, REPORT ON THE BALLISTIC MISSILE DE- FENSE REVIEW AND THE FISCAL YEAR 2011 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR MISSILE DEFENSE PROGRAMS, HEARING BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES OF THE COMMITTEE ON ARMED SERVICES HOUSE OF REPRESENTATIVES, <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:58294.pdf> p. 2

Gentlemen, I want to thank each of you for being with us here today, and we certainly look forward to your testimony. As ballistic missile technology proliferates across the globe and increases in capability, the potential threat to our Nation and our allies grows as well. Continued developments in both Iran and North Korea are our most urgent concerns. While recent intelligence estimates have highlighted the growing number of short- and medium-range missiles developed by these nations, both of these rogue states continue, as we know, to work on intercontinental ballistic missile (ICBM) technology that could lead to missiles which directly threaten our homeland. This past September, President Obama announced his plan for strengthening missile defenses in Europe through a Phased, Adaptive Approach to deploying defenses against the threat of Iranian ballistic missiles. On February 1, with the release of the budget, the Department submitted its first-ever Ballistic Missile Defense Review. The Administration’s review established six clear objectives to guide ballistic missile programs. First, the U.S. will continue to defend the homeland against the threat of limited ballistic missile attack. Second, the U.S. will defend against regional missile threats to U.S. forces, while protecting allies and partners and enabling them to defend themselves. Third, before new capabilities are deployed, they must undergo testing that enables assessment under realistic operational conditions. Fourth, the commitment to new capabilities must be fiscally sustainable over the long term. Fifth, BMD capabilities must be flexible enough to adapt as threats change. And, finally, the U.S. will seek to lead expanded international efforts for missile defense.

Information about current proposal (PAA)

Want to deploy radar in Europe by 2011, but don’t know which nation- high risk item

Don’t know much about the SM-3 Block IIA feasibility

Worried about integration with NATO

Committee head thinks he can get bipartisan support

Turner 2010- HON. MICHAEL TURNER, A REPRESENTATIVE FROM OHIO, RANKING MEMBER, SUBCOMMITTEE ON STRA- TEGIC FORCES April 15, 2010, REPORT ON THE BALLISTIC MISSILE DE- FENSE REVIEW AND THE FISCAL YEAR 2011 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR MISSILE DEFENSE PROGRAMS, HEARING BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES OF THE COMMITTEE ON ARMED SERVICES HOUSE OF REPRESENTATIVES, http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111\_house\_hearings&docid=f:58294.pdf p. 3-5

First, I am very concerned by recent comments from Administration officials that, essentially, Congress has everything it needs to know about the Phased, Adaptive Approach, PAA. As Under Secretary Tauscher said at our hearing yesterday in reference to PAA details, ‘‘It’s on the Internet.’’ Well, unfortunately, the Internet does not provide sufficient details on the four phases of the PAA, nor does it provide a description of the options considered by the Administration in addition to the PAA and the analysis to support why it was chosen as the preferred approach. Now, let me share a few examples of information that the committee does not have.

Phase 1 of the PAA calls for the deployment of a forward-based radar in Europe by the end of 2011. Now, we are considering the fiscal year 2011 budget request, yet we don’t have where this radar will be located or how long host nation negotiations might take. Right now this would appear to be a high schedule risk item. We do not know the number of ships, interceptors, and sensors that will be required for each phase, nor do we know the estimated costs or acquisition strategies for each phase.

We have minimal information on the technical feasibility, expected performance, and cost of the SM–3 Block IIA and IIB interceptors, which Senator Lieberman called ‘‘paper systems’’ just last year. So far, I am a little concerned as to why the Administration would be so slow in providing the information.

And, lastly, while we have positive statements from the North Atlantic Treaty Organization (NATO) Secretary General, we have yet to see details of a ‘‘NATO-ization’’ of the PAA, its integration with NATO’s missile defense architecture, and any allied contributions. Now, today, General O’Reilly, you provided a great deal of detail to us that we are going to be digesting from that. You have indicated that we can take, in a review of the information, the types of information to provide us milestones to be able to look at. We greatly appreciate your providing that to us.

Also today, I provided the General with a letter requesting his assistance in focusing on the issue of Phase 4 of PAA being the phase where mainland United States really becomes engaged with the assistance of missile defense. And I have a copy of that letter, if we can add that into the record, Mr. Chairman.

Mr. LANGEVIN. Without objection.

[The information referred to can be found in the Appendix on page 89.]

Mr. TURNER. I appreciate all of your expertise and all of your dedication. I know that you guys have worked diligently to ensure that we have a quality system, and I look forward to the exchange and the additional information you can provide so that we can work even more closely together.

I want to note that this committee had asked similar information of the prior administration on its prior proposed configuration of missile defense. And I think that this is an opportunity to gain bipartisan support for the current PAA plan, but the committee must have confidence that the PAA is the best approach for protecting the United States and our European allies, and then, of course, mainland United States.

Testimony of general

8.4 billion budget request

Expand the ground based systems

Test the ground systems

Buy 5 more ground based systems

Regional systems

Prove systems work

Many, not all, companies have improved

O’Reilly 10- Lieutenant General Patrick O’Reilly is Director of the Missile Defense Agency (MDA), April 15, 2010, REPORT ON THE BALLISTIC MISSILE DE- FENSE REVIEW AND THE FISCAL YEAR 2011 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR MISSILE DEFENSE PROGRAMS, HEARING BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES OF THE COMMITTEE ON ARMED SERVICES HOUSE OF REPRESENTATIVES, <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:58294.pdf>, p. 7-9

General O’REILLY. Good afternoon, Chairman Langevin, Congressman Turner, and other distinguished members of the committee. It is an honor to testify before you today on the Missile Defense Agency’s support to the Ballistic Missile Defense Review and our $8.4 billion fiscal year 2011 budget request to continue our mission to develop and field an integrated, layered Ballistic Missile Defense System to defend the United States, its deployed forces, allies, and friends against ballistic missiles of all ranges and in all phases of flight.

This budget request reflects strategy and policies stated in the Ballistic Missile Defense Review report and the prioritized missile defense needs of our combatant commanders and services as stated in the latest U.S. Strategic Command’s missile defense prioritized capabilities list.

Under the oversight and direction of the Missile Defense Executive Board, chaired by the Under Secretary of Defense for Acquisition, Technology, and Logistics, the Missile Defense Agency proposes a fiscal year 2011 program o gthat is balanced to achieve the six strategy and policy goals documented in the Ballistic Missile Defense Review report.

First, defense of the homeland against limited attack. We continue to upgrade the Ground-Based Midcourse Defense System to increase reliability, survivability, and expand the ability to leverage new ballistic missile defense sensors, as well as test the GMD system to accredit our models and simulations. The purchase of five additional ground-based interceptors and limited life components for refurbishment—and our program is very extensive—will sustain our production capability until 2016 and critical component manufacturing beyond 2020.

Second, the defense against regional threats. We have increased our investment in regional assets and, by 2015, will procure 436 SM–3 IA and IB interceptors and 431 THAAD missiles, and have available 38 ballistic missile defense-capable ships. We are developing regional missile defense elements that can be adapted to unique circumstances of each combatant command region. For example, we determined, based on intelligence estimates, that our previous plan for the defense of Europe could simply be overwhelmed by the large number of Iranian medium-range ballistic missiles (MRBMs) today and intermediate-range ballistic missiles (IRBMs) in the near future. Therefore, we plan to deploy a larger number of interceptors in Europe in four phases as missile defense threats from the Middle East evolve.

Third, prove that the missile defense system works. We have submitted a comprehensive, Integrated Master Test Plan signed by the Director of Operational Test and Evaluation, Dr. Gilmore, the services, the Operational Test Agencies, the Commander of the U.S. Strategic Command’s Joint Functional Component Command for Integrated Missile Defense subcommand to ensure we extensively fly our missiles and test them before we buy them.

The two largest challenges to executing the U.S. missile defense program is acquiring a cost-effective set of reliable targets and improving quality control. Over the past year, we have initiated steps to acquire a new set of targets of all ranges. Our new target acquisition strategy initiated in 2009 procures targets and production lots to increase competition, quality control, reduce costs, and ensures the availability of backup targets starting in 2012.

We have had many successes in improving our prime contractor and supplier quality assurance to meet the precise manufacturing standards required for missile defense components; however, not all companies have sufficiently improved. Until we complete planned competitions, including the greater use of firm, fixed-price contracts, we will have to motivate greater attention by senior industry management through intensive government inspections, low award fees, the issuance of cure notices, stopping the funding of new contract scope, and documenting inadequate quality control performance to influence future contract awards.

Future technologies being focused on

More accurate and faster tracking systems

Command and control

Continue laser technologies

Develop new sustainable capabilities over the long term

Expand co-operation

O’Reilly 10- Lieutenant General Patrick O’Reilly is Director of the Missile Defense Agency (MDA), April 15, 2010, REPORT ON THE BALLISTIC MISSILE DE- FENSE REVIEW AND THE FISCAL YEAR 2011 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR MISSILE DEFENSE PROGRAMS, HEARING BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES OF THE COMMITTEE ON ARMED SERVICES HOUSE OF REPRESENTATIVES, <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:58294.pdf>, p. 7-9

Fourth, we are hedging against threat uncertainty. In accordance with warfighter priorities, we are focusing our future technologies in four areas: one, developing more accurate and faster tracking sensors on platforms to enable fire control solutions and intercepts earlier; two, developing enhanced command-and-control networks to link and rapidly fuse sensor data to handle large raid sizes of missile threats; three, developing a faster, more agile version of our SM–3 interceptor to destroy long-range missiles early in flight; and, four, developing discrimination techniques to rapidly resolve re-entry vehicles from other nearby objects. And we will continue to develop high-energy laser technologies.

Fifth, develop new, fiscally sustainable capabilities over the long term. The Missile Defense Agency is complying with the Weapons Systems Acquisition Reform Act by establishing six baselines—cost, schedule, technical, test, contract, and operational—to plan, manage, and increase service and warfighter participation, and increasing emphasis on competition in all phases of programs’ acquisition life cycle.

Six, expand international missile defense cooperation. We are currently engaged in missile defense projects, studies, and analysis with over 20 countries, including Japan, Poland, the Czech Republic, Israel, Australia, United Kingdom, Germany, South Korea, NATO, United Arab Emirates, Bahrain, Saudi Arabia, and Kuwait. Additionally, Poland and Romania have agreed to host our Aegis Ashore sites, and we continue cooperative development of the SM– 3 IIA interceptor with Japan.

We also continue to support expert dialogue with the Russian Federation on missile defense cooperative efforts. Relative to the recently expired START Treaty, the New START Treaty actually reduces constraints on the development of the missile defense program. Our targets will no longer be subject to START constraints, which limited our use of air-to-surface and waterborne launches of targets which are essential for the cost-effective testing of missile defense interceptors against medium-range and intermediate-range ballistic missiles in the Pacific region.

In conclusion, MDA is working with the combatant commanders, services and other Department of Defense (DOD) agencies, academia, industry, and international partners to address the challenges and difficulties of managing, developing, testing, fielding new military capabilities to deter the use of ballistic missiles and effectively destroy them once launched.

Our 2011 budget funds the warfighters’ near-term priorities while building the foundation of a layered defense system with our partners and friends that can provide an adaptive, cost-effective strategy to protect our homelands and counter ballistic missile proliferation in the future.

Thank you, Mr. Chairman. I request my written statement be submitted for the record, and I look forward to answering your questions.

Focus on ground defense now

Research on directed energy systems as well (ABL)

Roberts 11- DR. BRAD ROBERTS is DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR NUCLEAR AND MISSILE DEFENSE POLICY, March 31, 2011, Statement before the House Armed Services Committee, http://armedservices.house.gov/index.cfm/files/serve?File\_id=bfe4d4ec-fc67-440e-a92a-0f63934ad33e

The commitment to continue to improve the GMD[Ground-Based Midcourse Defense] system is reflected in a number of on-going activities and in the associated FY2012 budget. We continue to: • Test and upgrade the system to increase reliability and survivability • Develop and upgrade Ballistic Missile Defense System (BMDS) sensors • Procure GBIs (in FY12, we will procure five more) • Implement GBI[Ground Based Interceptor] refurbishment and reliability sustainment programs (in order to sustain the fleet for another two decades) • Upgrade GMD Fire Control ground system software • Enhance the Command, Control, Battle Management and Communications system to handle larger raid sizes • Develop and deploy new sensors in a variety of settings – including forward bases in Europe, unmanned vehicles in the skies, and platforms in space • Develop early-intercept concepts to help defeat countermeasures and reduce the inventory required to negate missile launches

Additionally, we are developing the Standard Missile 3 (SM-3) Block IIB for deployment against future IRBM and ICBM threats in the regional defense architectures (as discussed further below), which is an important part of the long-term defense against future ICBM threats to the homeland. The performance of the GMD system will also be strengthened with new investments that will result in better sensor information reaching the GBI during its flight. The FY2012 budget includes new funding for an In Flight Interceptor Communications System (IFICS) Data Terminal (IDT) on the East Coast and for upgrades to the Early Warning Radars at Clear, Alaska, and Cape Cod, Massachusetts. Looking to the longer term, the administration is also investing to develop next generation missile defense capabilities. This includes continued work to research the potential of directed energy systems for missile defense. We are sustaining these commitments even as the Department has identified efficiencies and cuts as a result of government-wide budget limitations. These capability enhancements will contribute significantly to preservation of the currently advantageous posture of the United States against limited strikes if or as ICBM threats develop from Iran and North Korea, or other regional threats. But they may not be enough. The United States must also be well hedged against the possibility that threats might evolve more rapidly than planned capability enhancements. It must also be well hedged against the possibility that those capability enhancements may be delayed for technical reasons. After all, development programs involve inherent technical risk.

To strengthen the U.S. hedge posture, the administration has taken the following steps: Construction of Missile Field 2 at Ft. Greely, Alaska is being completed in a 14-silo configuration to accommodate a contingency deployment of eight additional GBIs if needed. Six GBI silos at Missile Field 1 at Ft. Greely are being mothballed instead of decommissioned, allowing their return to service within two years if necessary; and • Testing and assessment of a two-stage Ground-Based Interceptor is continuing in order to preserve future deployment options.

Significant investment in tracking

Test in 2012 for space monitoring

O’Reilly 10- Lieutenant General Patrick O’Reilly is Director of the Missile Defense Agency (MDA), April 15, 2010, REPORT ON THE BALLISTIC MISSILE DE- FENSE REVIEW AND THE FISCAL YEAR 2011 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR MISSILE DEFENSE PROGRAMS, HEARING BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES OF THE COMMITTEE ON ARMED SERVICES HOUSE OF REPRESENTATIVES, <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_house_hearings&docid=f:58294.pdf>, p. 22-23

General O’REILLY. Thank you, sir. First of all, we need to have a greater effectivity of each one of the missiles we launch. So our investment program in advanced technologies is designed to have better use of our sensors so we can track missiles early in their flight and pass that information to an interceptor and intercept missiles earlier. When we have large raids of missiles that, as you describe, sir, the threat is growing, I don’t know of a technical reason why we won’t be facing large raid sizes in the future of increasingly longer-range threats. We need to defeat those missiles early in flight, and key to that is having sensor systems and using all of our possible sensors—including unattended air vehicles—and, from space, have the ability to track and launch interceptors sooner. So we have a significant investment in that area. Associated with that is a very rapid command-and-control system which could then pass that information so we could, in fact, have intercepts earlier, as soon as immediately after a boost. So that is one investment area we are making, and we are working on that very quickly. In 2012, we have several demonstrations of intercepting missiles early in flight from an Aegis ship by using one unattended air vehicle and a second test which we will be tracking from space. So that capability will be available based on the success of the work we are doing right now, and that test to prove we have that, so that by the middle of this decade we will have an ability to start destroying missiles early in flight.

I have asked for the Defense Science Board to do an independent assessment of what I just said, and they have agreed to that, the Secretary of Defense has agreed to that, and they will be studying that this year for an independent report out in the late summer on, in fact, the capability and when we will have this early intercept capability, as I just stated.

\*\*\*Blocks\*\*\*

# CPs

## AT – Privatization

Full privatization is too risky. The U.S. needs to play a role in exploration. AT privatization cp

New York Times 04- WARREN E. LEARY and JOHN SCHWARTZ staff writers, June 14 “NASA Is Urged To Widen Role For Businesses” Section A; Column 5; National Desk; Pg. 1, http://www.nytimes.com/2004/06/15/us/nasa-is-urged-to-widen-role-for-businesses.html

But Professor McCurdy and other outside experts warned of taking privatization too far. Donald Lamb, an astrophysicist at the University of Chicago and chairman of a committee on space science sponsored by the Association of American Universities, said he was encouraged by the committee's charge that the exploration mission be ''discovery driven.'' But the outsourcing recommendation seems unrealistic, he said. ''Space exploration,'' he added, ''particularly manned space exploration, is just too expensive and risky to attract private enterprise, especially venture capitalists.'' In another recommendation, the commission said NASA should reorganize its 10 field centers, which specialize in different types of space technology and missions, like engines or aircraft design, and which often build spacecraft and other equipment. NASA should consider converting most of these centers to research and development institutions run by universities or private concerns, much like the Energy Department's national laboratories, it said. Under this plan, which the panel said would encourage innovation and more work with industry, most NASA centers would operate more like the Jet Propulsion Laboratory, which specializes in interplanetary missions and has for decades been managed by Caltech.

AT Privitization Full privatization is too risky. The U.S. needs to play a role in exploration.

New York Times 04- WARREN E. LEARY and JOHN SCHWARTZ staff writers, June 14 “NASA Is Urged To Widen Role For Businesses” Section A; Column 5; National Desk; Pg. 1, http://www.nytimes.com/2004/06/15/us/nasa-is-urged-to-widen-role-for-businesses.html

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A2: Commercialization CP- can’t defend the nation

Frederick 9 – Lt Col Lorinda A. Frederick, USAF, BA, Michigan State University; MBA, Regis University; Master of Military Operational Art and Science, Air Command and Staff College; Master of Airpower Art and Science, School of Advanced Air and Space Studies, 9/1/09, “Deterrence and Space-Based Missile Defense,” Air and Space Power Journal, Fall 2009

The DOD cannot expect developments in commercial industry to be available for national security purposes. Competitive pressures force industry to fund near-term R&D programs and choose near-term survival over long-term possibilities.54 Applied research into SBMD technologies would allow the United States to gain more knowledge about boost-phase defenses. America will get as much R&D in SBMD technologies as it is willing to fund.

Unilateral pursuit by the USFG critical to SMD

Frederick 9 – Lt Col Lorinda A. Frederick, USAF, BA, Michigan State University; MBA, Regis University; Master of Military Operational Art and Science, Air Command and Staff College; Master of Airpower Art and Science, School of Advanced Air and Space Studies, 9/1/09, “Deterrence and Space-Based Missile Defense,” Air and Space Power Journal, Fall 2009

Unilateral pursuit of SBMD strengthens United States’ ability to protect itself without international constraints on how the US projects power and maintains freedom of action. The ability to project power lets sovereign nations defend their interests without relying on other states. SBMD could enable a global on-call missile defense capability and a timely response to rapidly evolving threats.5

The United States has the freedom to launch SBMD assets into orbits favorable for deterring or responding to threats from hostile states. After unilaterally deploying such capabilities, the United States would be free to launch its space-based interceptors when it felt the need to project power. Land- based defenses located on foreign soil, by contrast, might have to request permission from the host nation before launching their interceptors. SBMD could therefore enhance both power projection and freedom of action.

SBMD can also help the United States reduce its dependence on other states further. Augmenting the current BMD architecture with SBMD could let the nation re- deploy land, sea, and air assets and reduce its dependency on overseas bases. Foreign public opinion may not support other forms of missile defense technology on their sovereign territory.6

Political ties between the United States and other countries may be strained if there is public controversy over proposals to field land-based missile defense. Foreign populations who view interdependence as a potential vulnerability may find it unsettling to depend on the United States for their defense. SBMD could insulate the United States from the oscillating currents of foreign public opinion.

Full privatization is too risky. The U.S. needs to play a role in exploration. AT privatization cp

New York Times 04- WARREN E. LEARY and JOHN SCHWARTZ staff writers, June 14 “NASA Is Urged To Widen Role For Businesses” Section A; Column 5; National Desk; Pg. 1, http://www.nytimes.com/2004/06/15/us/nasa-is-urged-to-widen-role-for-businesses.html

But Professor McCurdy and other outside experts warned of taking privatization too far. Donald Lamb, an astrophysicist at the University of Chicago and chairman of a committee on space science sponsored by the Association of American Universities, said he was encouraged by the committee's charge that the exploration mission be ''discovery driven.'' But the outsourcing recommendation seems unrealistic, he said. ''Space exploration,'' he added, ''particularly manned space exploration, is just too expensive and risky to attract private enterprise, especially venture capitalists.'' In another recommendation, the commission said NASA should reorganize its 10 field centers, which specialize in different types of space technology and missions, like engines or aircraft design, and which often build spacecraft and other equipment. NASA should consider converting most of these centers to research and development institutions run by universities or private concerns, much like the Energy Department's national laboratories, it said. Under this plan, which the panel said would encourage innovation and more work with industry, most NASA centers would operate more like the Jet Propulsion Laboratory, which specializes in interplanetary missions and has for decades been managed by Caltech.

Logistics

Uncertainty in launch sites

Airbased defenses also fail

Politics prevent ideal placing for interceptors

Air based systems have to comply with international borders

Kleinberg 11- Howard Kleinberg is a member of the graduate faculty of the Department of Public & International Affairs at University of North Carolina Wilmington. The author has a Master of Arts in the Security Studies Program from Georgetown University, Washington, D.C. and a Bachelor of Science in Electrical Engineering from the University of Toronto, Canada. He also has 25 years of experience in the U.S. Defense Sector, the Space Industry, and software engineering, March 1, 2011, “A global missile defense 'network': terrestrial High-Energy lasers and Aerospace mirrors part 1 of 2.” Fires , http://www.highbeam.com/doc/1G1-251954702.html

There are other complications involved in planning and positioning terrestrial-based BP interceptor missiles. First, in the case of landmobile ballistic missiles, there is considerable uncertainty as to the location of their launch sites, which greatly complicates basing calculations for both land and sea-based missile defenses. Even airbased missile defenses might be out of position when the missile is launched; and once the missile is aloft, any aircraft is effectively 'standing still' by comparison. Then there Is the problem of geography, wherein borders and coastlines, and politics, may prevent terrestrial BP missile-defense systems from being placed in locations from which they can provide effective defenses. Even air-based defenses must obey international borders, or risk triggering a war. Further, the basing problem is multiplied for boost-phase defenses against submarine-launched ballistic missiles, which could virtually be fired from any of the Earth's oceans. Evidence of this contention, taken from a Washington Times article, "Obama's Gutless Missile Defense Policy," by Michael Turner, lies in the 2009 cancellation of the Kinetic Energy Interceptor Program.

Current Radar Sucks

Radar cant discern missiles from wires

Huge mass of decoys could be created

Not enough tracking range

Easy to implement counter-measures against Aegis and GMD systems

Lewis and Postol 10- George N. Lewis has a Ph.D. in experimental physics and is associate director of the Peace Studies Program at Cornell University. Theodore A. Postol is professor of science, technology, and national security policy at the Massachusetts Institute of Technology and a former scientific adviser to the chief of naval operations, May 2010, “A Flawed and Dangerous U.S. Missile Defense Plan”, Arms Control Today, http://people.reed.edu/~ahm/Courses/Reed-POL-358-2011-S1\_SWP/Syllabus/EReadings/10.2/10.2.LewisPostol2010A-Flawed.pdf

The forward-based X-band radars will have only a modest ability to discern differences in the radar signals from different objects deployed by ballistic missiles at the end of their powered flight. For that reason, these radars will not be able to guarantee that warheads will be confidently distinguished from pieces of debris or decoys. The radars will be able to observe at a range of thousands of kilometers the bodies of rockets that launch warheads, but the radars will have little or no capacity to track warheads deployed by these rockets at these ranges, as the shape and geometry of such warheads make them inherently stealthy relative to the missile bodies.

If ballistic missile trajectories rise above the curved earth into the line of sight of any low-frequency, lowresolution giant U.S. early-warning radar, all of their components, including the warheads, can be tracked. Unlike the much higher-frequency, higher-resolution, shorter-range X-band radars, however, the earlywarning radars have no ability whatsoever to discern differences in the radar reflections from distant objects. In fact, the ability of the low-frequency early-warning radars to tell one object from another is so poor that they could not distinguish warheads from two-foot-long wires. Tens to hundreds of thousands of such wires can be used to create a massively confusing clutter of decoys and would weigh no more than a pound.

The necessarily small size of the radar antennas on Aegis-equipped ships and the low power of these radars typically result in detection and tracking ranges against warheads and missiles that are too short to allow adequate time for SM-3 interceptors to reach their targets. The new defense architecture attempts to address this problem by assuming that ships will launch their interceptors before their Aegis radars actually observe attacking targets. In many actual engagements, ships would likely never see the inherently stealthy warhead targets with their radars. However, if the external tracking radars have provided the ships with sufficiently precise tracking information, such “blind launches” could be used to guide interceptors to the minuscule volumes of space, roughly 10 kilometers on a side, where interceptors might then be able to use their infrared sensors to find and home in on target warheads.

If an adversary deployed thousands of wires on slightly different trajectories along with warheads, the earlywarning radars would not be able to determine which radar signal was from a warhead and which was from a wire. The Aegis ships then would not have the precise tracking information they would need to make a blind launch. This same strategy could also be implemented, with minor adjustments, against the much higher-resolution but inherently shorter-range X-band radars that are also supposed to provide precise tracking data as part of the new architecture and against any airborne infrared sensors carried by UAVs that might, by chance, be in a position to observe the complex of objects launched by missiles.

Thus, any of the many simple countermeasures that disrupt the ability to provide precision tracking data to the Aegis ships could make it impossible for the ships to execute a blind launch. The same kind of basic engagement problems also apply to the GMD system.

ABL not reliable as boost-phase interceptor

Logistical and operational problems

Vulnerable to enemy attacks

Pfaltzgraff 9- Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, April 3, 2009, “Boost Phase Missile Defense: Present Challenges, Future Prospects”, http://www.ifpa.org/pdf/Pfaltzgraff\_Boost-Phase.Missile.Defense\_Capitol.Hill-Marshall.Inst\_3.April.09.pdf

Finally, the United States has been developing the airborne laser, to be deployed on board a Boeing 747. The ABL could detect, track, and intercept an attacking missile within its range while still in boost phase. Nevertheless, there are logistical and operational problems and enemy counter measures that diminish the utility of the ABL. Operations during a crisis or war would depend on the ability to provide relative safety to the aircraft via protective escort aircraft. The ABL would be vulnerable because an enemy would probably take action to prevent its missiles from becoming vulnerable to boost-phase intercept.

Countries have developed countermeasures that make GMD ineffective

Iran and nook demonstrate cutting stages which confused GMD

Little time to analyze complexes of multiple targets

Both SM-3 and GMD

Most tests have failed

Current systems cant identify warheads

Lewis and Postol 10- George N. Lewis has a Ph.D. in experimental physics and is associate director of the Peace Studies Program at Cornell University. Theodore A. Postol is professor of science, technology, and national security policy at the Massachusetts Institute of Technology and a former scientific adviser to the chief of naval operations, May 2010, “A Flawed and Dangerous U.S. Missile Defense Plan”, Arms Control Today, http://people.reed.edu/~ahm/Courses/Reed-POL-358-2011-S1\_SWP/Syllabus/EReadings/10.2/10.2.LewisPostol2010A-Flawed.pdf

By using simple explosive techniques to cut the one-stage rocket-target into multiple pieces, a potential adversary could substantially further increase the chances that an SM-3 or GMD interceptor would miss the warhead. Iran and North Korea successfully demonstrated this cutting technique when they separated the stages in the multistage rockets they have already flown.[8] The same could be done to the upper stage of a multistage rocket to counter the homing of the GMD kill vehicle, creating the same confusion of objects to conceal the true location of the warhead from the GMD system.

The scenario illustrated in Figure 2 understates the complexity of the scene that would have to be analyzed by the homing kill vehicle, as the images were generated by assuming that the fragments only tumble in the plane perpendicular to the line of sight of the approaching interceptor. It also does not assume that additional false targets have been created by balloons or unfolded objects that might be deployed as part of this countermeasure.

In the case of the GMD system, which is designed to be able to hit ICBM warheads, the problem is essentially the same. Because the sensor must work at long range, there is little time during the homing process to analyze complexes of multiple targets that could be intentionally and easily created by adversaries. In these situations, the closing speeds will be much higher than those encountered in SM-3 tests, about 12 to 15 kilometers per second compared to four to five kilometers per second. The higher speed requires that the kill vehicle see its targets at much longer range, 450 to 600 kilometers. In order to provide adequate time to maneuver to hit the target, the kill vehicle must have a much larger optical aperture to collect signals from the more distant targets and a much narrower field of view (about 1 degree instead of the roughly 3.5 degrees used in the SM-3 kill vehicle) to be able to get comparably accurate spatial information. In other words, the vulnerabilities of the SM-3 and GMD kill vehicles to countermeasure technologies that have already been demonstrated by Iran and North Korea are the same.

The same fundamental system vulnerability that led to the failure to hit warheads in the SM-3 tests also led to the failure of the X-band radar in the January 31, 2010, GMD missile defense flight test, the FTG-06. The source of this fundamental system vulnerability is the inability of ground-based long-range radars and interceptor-based infrared homing sensors to provide the kind of accurate and detailed images that make it possible to identify the warheads unambigously. Without such true and unambiguous image data, it is fundamentally not possible to recognize the warhead when it is attached to or surrounded by unexpected objects that also individually appear to be different from what was expected.

AT- Tests prove current BMD is effective

In tests, there aren’t multiple opjects

Target missiles are side on to interceptor

Exact geometry of missile is known

They still failed the tests according to DOD

Tests show adversaries how to attack

DOD assessment is flawed and wrong

Lewis and Postol 10- George N. Lewis has a Ph.D. in experimental physics and is associate director of the Peace Studies Program at Cornell University. Theodore A. Postol is professor of science, technology, and national security policy at the Massachusetts Institute of Technology and a former scientific adviser to the chief of naval operations, May 2010, “A Flawed and Dangerous U.S. Missile Defense Plan”, Arms Control Today, http://people.reed.edu/~ahm/Courses/Reed-POL-358-2011-S1\_SWP/Syllabus/EReadings/10.2/10.2.LewisPostol2010A-Flawed.pdf

The flight-test data from the 2002-2009 tests show many striking artificialities that would not be present in actual combat conditions. There are not multiple objects in the threat volume, there are large fins on the back end of the target missiles, the target missiles are always side-on to the interceptor, and the exact geometry of the target missile is known. All these factors considerably simplify the interceptors’ job. Yet, in spite of these artificial advantages built into the tests, the Defense Department’s own data show that the interceptors almost always failed to achieve necessary hits on the warheads.

These test data show potential adversaries such as Iran and North Korea exactly how to defeat the SM-3 and GMD interceptors with technologies they already have flight-tested. The information also shows that the Defense Department’s own technical oversight and assessment of the missile defense program, as described by the missile defense report, is deeply flawed and unreliable. It is yet another example of why measures need to be taken to provide a truly independent source for the White House and Congress to confirm the veracity of claims being made by the MDA and others in the Defense Department about missile defense performance.

SBI’s can replace ground based weapons

Sweep the globe

All surface systems have to deal with gravity and atmosphere

Continuous coverage of any region

Multiple opportunities at all stages of flight

Kleinberg 11- Howard Kleinberg is a member of the graduate faculty of the Department of Public & International Affairs at University of North Carolina Wilmington. The author has a Master of Arts in the Security Studies Program from Georgetown University, Washington, D.C. and a Bachelor of Science in Electrical Engineering from the University of Toronto, Canada. He also has 25 years of experience in the U.S. Defense Sector, the Space Industry, and software engineering, March 1, 2011, “A global missile defense 'network': terrestrial High-Energy lasers and Aerospace mirrors part 1 of 2.” *Fires ,* http://www.highbeam.com/doc/1G1-251954702.html

Fourth, and arguably the greatest single advantage of SB-BMD weapons, is their inherent force-multiplier effect. As Gregory Canavan observed in his article, "Estimates of Cost and Performance for Boost-Phase Intercept," any single space-based weapon can replace hundreds or even thousands of ground-based weapons to cover the same territory. This is because an object in space will sweep over the entire globe, covering a swath of ground, and air, for thousands miles on either side of its flight-path. This same effect holds true for space-based weapons when compared sea-based forces, though the latter's greater mobility and of movement reduces the advantages somewhat. However, like land-based counterparts, sea-based weapons must also climb out the earth's gravity -well and atmosphere, with zero initial and altitude, the same constrictions that apply to all surface-launched systems.

Finally, SB-BMD weapons would be placed in orbiting 'bands' of interceptors in approximately the same orbits, providing both continuous coverage of target regions, and affording multiple opportunities to intercept any given ballistic missile throughout its flight, although this depends upon the interceptor’s boost capabilities. Further interception opportunities are available in the missile's midcourse and even terminal phases as much as the boost-phase, according to Pfaltzgraff's and Van Cleave's 2009 report, "Independent Working Group on Missile Defense, the Space Relationship, and the Twenty -First Century."

## AT – International

US focus on SBMD allows allies to focus on terrestrial missile defense- creates global layered system that enforces extended deterrence,

Pfaltzgraff and Van Cleave 9 - Dr. Robert L. Pfaltzgraff, President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave, Professor Emeritus Department of Defense and Strategic Studies, “Missile Defense, the Space Relationship, & the Twenty-First Century,” p. 108, The Institute for Foreign Policy Analysis, http://www.ifpa.org/pdf/IWG2009.pdf

Such U.S. and allied missile defense efforts will create the foundation for a “system of systems.” And although the

United States will contribute to each layer of a global missile defense system, it is likely that a logical division of labor will evolve in which the United States focuses primarily on space-based components while allies and coalition partners emphasize sea- and land-based systems. A system of systems will make it extremely difficult for an adversary to undermine U.S. crisis decision making by threats to launch ballistic missiles against either the United States, U.S. forces forward deployed, or America’s allies or coalition partners. Such an approach will reassure allies who otherwise might feel increasingly vulnerable to WMD and missile threats, including EMP attacks from ship-borne Scuds, as well as helping to dissuade states from developing nuclear weapons and their delivery systems by reinforcing U.S. extended deterrence

Perm solvency- cooperation increases extended deterrence- mutual benefits- solves lack of investment

Pfaltzgraff and Van Cleave 9 - Dr. Robert L. Pfaltzgraff, President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave, Professor Emeritus Department of Defense and Strategic Studies, “Missile Defense, the Space Relationship, & the Twenty-First Century,” p. 108, The Institute for Foreign Policy Analysis, http://www.ifpa.org/pdf/IWG2009.pdf

However, what overseas partners often lack is the level of investment necessary to move technologies from the

drawing board to actual systems that could be deployed.70 Politically, the United States could strengthen its overall relationship with its allies by cooperative programs where the United States and its allies and coalition partners share threats and interests, and can benefit mutually from pooling their resources to produce a truly global layered missile defense that includes a space-based component, thus reinforcing the extended deterrence provided by the United States to numerous allies and coalition partners.

Perm solvency- Allies will co-operate on missile defense- empirically proven by multiple projects in squo

Kugler 3 **–** Mitch Kugler, 6-30-2003, director of Strategic Initiatives for Boeing’s Missile Defense Systems business which was in charge of missile defense activities in NATO member countries, “INTERNATIONAL MISSILE DEFENSE COOPERATION AND THE

MTCR,” Nonproliferation Policy Education Center, http://www.npolicy.org/article\_file/Presentation030630\_Kugler\_Missile\_Defense\_Cooperation\_and\_MTCR\_TB\_030211\_0555.pdf

In fact, international cooperation has already begun. The United States is – and been – working with Israel on the Arrow interceptor for quite some time, and enhanced co-production of the interceptor is beginning in the United States. We are working with Japan on the Standard Missile-3 and Japan has noted publicly its interest in working on a larger booster for the SM-3. We are working with Italy and Germany on the MEADS program, and with the United Kingdom on the upgrade to the early warning radar at Fylingdales. It appears that a similar upgrade, in cooperation with Denmark, will 3.also soon begin on the Thule early warning radar. The bilateral missile defense relationship also appears to be proceeding quickly with Poland, as does the multilateral missile defense work with NATO, which in a recent major move forward added the protection of population centers to its considerations for missile defense. So there is cooperation with six countries – Israel, England, Japan, Germany, Italy, and Denmark; expanding cooperation with NATO; and imminent cooperation with Poland, which is rapidly emerging as one of America’s closest allies

Unilateral deployment is key to maintain heg

Frederick 8--- Lorinda Frederick, Lieutenant Colonel in the USAF, “DETERRENCE AND SPACE-BASED MISSILE DEFENSE” SCHOOL OF ADVANCED AIR AND SPACE STUDIES AIR UNIVERSITY, June 2008, pg 40-41

In deciding if the United States should pursue SBMD to deter ballistic missile attacks, the next administration can choose to act unilaterally or multilaterally. Based on Michael Doyle’s complex realism model, SBMD may be important enough to pursue unilaterally. However, based on an argument articulated by William H. Riker, it would be better for the United States to pursue SBMD multilaterally. Arguments for a Unilateral Approach to SBMD A realist moral philosophy holds pursuit of the national interest as an ideal guide to the formulation of state policy, especially in a dangerous international system. 3 Dangers abound internationally due to political uncertainties in states and rogue elements. World politics may be characterized by a “state of war,” not a single continuous war or constant wars, but the constant possibility of war among all states. 4 Viewing the unilateral pursuit of SBMD through the lens of complex realism, reveals areas the United States may emphasize. Unilateral pursuit of SBMD strengthens United States’ ability to protect itself without international constraints on how the US projects power and maintains freedom of action. The ability to project power lets sovereign nations defend their interests without relying on other states. SBMD could enable a global on-call missile defense capability and a timely response to rapidly evolving threats. 5 The United States has the freedom to launch SBMD assets into orbits favorable for deterring or responding to threats from hostile states. After unilaterally deploying such capabilities, the United States would be free to launch its space-based interceptors when it felt the need to project power. Landbased defenses located on foreign soil, by contrast, might have to request permission from the host nation before launching their interceptors. SBMD could therefore enhance both power projection and freedom of action. SBMD can also help the United States reduce its dependence on other states further. Augmenting the current BMD architecture with SBMD could let the nation redeploy land, sea, and air assets and reduce its dependency on overseas bases. Foreign public opinion may not support other forms of missile defense technology on their sovereign territory. 6 Political ties between the United States and other countries may be strained if there is public controversy over proposals to field land-based missile defense. Foreign populations who view interdependence as a potential vulnerability may find it unsettling to depend on the United States for their defense. SBMD could insulate the United States from the oscillating currents of foreign public opinion. Although some worry that a unilateral US approach to SBMD could start a new arms race or increase tension, the lens of complex realism questions the inevitability of these outcomes. Realism typically focuses on relative power and not absolute power, and SBMD do not have to upset the balance of relative power.

They link back to politics- international cooperation over SMD is unpopular

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

In August 2006, the Bush Administration issued a major, high-profile pronouncement about space arms control. The administration rightfully reminds us that arms control is not an end in itself, but rather a tool to help the nation realize its national security strategy. Officials believed the 1972 Anti-Ballistic Missile Treaty posed a danger to security, impeding the development, testing, and deployment of effective missile defenses to defend the country and U.S. troops, allies, and friends. When Washington withdrew from the treaty in June 2002, the restrictions on deployment of missile defenses in the air, sea, and space environments went away. We effectively got rid of the single greatest obstacle to the deployment of non-nuclear space arms, although this was not the reason cited by officials for withdrawal.

It is plain that the U.S. government believes there is no need today for new outer-space arms-control agreements. There are a number of standing agreements that already sufficiently regulate military activities in outer space. And so Washington supports the existing space law regime and the development of the rule of law in that environment.

Unilateral pursuit by the federal government is key to SMD

Frederick 9 – Lt Col Lorinda A. Frederick, USAF, BA, Michigan State University; MBA, Regis University; Master of Military Operational Art and Science, Air Command and Staff College; Master of Airpower Art and Science, School of Advanced Air and Space Studies, 9/1/09, “Deterrence and Space-Based Missile Defense,” Air and Space Power Journal, Fall 2009

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## AT- Ground

Ground cp U.S. military focused on land based now, space based missile defense spills over to other aspects in the military and increases U.S. leadership

Schaffer 03- Bob, former U.S. Senator and Congressman from Colorado former vice chairman of the senate education committee, 10/15/2003, “US Needs Space-Based Missile Defense”, Vital Speeches of the Day Vol. 70, Issue 1, 28-32

For this reason U.S. military strategy emphasizes air superiority, the high ground of combined air, land, and sea operations. There is also the high ground of space, which U.S. military forces recognize as vital to the operation of our intelligence, communications, reconnaissance, and navigation systems, which rely heavily on satellites. Building an effective missile defense also requires good position. But this position isn't found on the ground, it is found in space where the ballistic missile operates. Building an effective missile defense requires a strategy that deploys a missile defense in the high ground of space. Good leadership would deploy a **missile** **defense** in **space**. Good leadership would point the way to **space**. Both the Strategic **Defense** Initiative of the 1980's and early 1990's and Project Defender of the later 1950's and early 1960's pointed the way to **space**, recognizing the inherent advantages of deploying a **missile** **defense** in **space**. The earlier Project Argus nuclear test shots in 1958 and Starfish 1962 also pointed to **space**. Dr. Nicholas Christofilos from Lawrence Livermore realized **space** provides a position with global coverage against ballistic **missile** threats. The strategic advantages of deploying a missile defense in space are considerable. Global coverage, the capability for boost-phase interception, the use of robotics minimizing operational costs, and the potential of high-energy lasers and particle beams led these earlier missile defense programs to emphasize the development of defenses based in space. Even the Clinton administration was aware of the advantages that accrue from deployment of a **missile** **defense** in **space**, as seen in its decision to complete the termination of the Brilliant Pebbles program for deploying a **space**-**based** interceptor **defense**, and attempt to terminate the **Space** **Based** Laser.

Explanation of Missile Defense technology and capabilities A2: ground counterplan- layered defense is good

Aubin and Streland 2k- Dr. Stephen P. Aubin and Major Arnold Streland, phd. Director strategy execution at Raytheon and Col Arnold H. Streland, Commander, TSAT Space Group, MILSATCOM Systems Wing, Space and Missile Systems Center, October 2000 , “The Space-Based Laser Integrated Flight Experiment: Global Missile Defense in the Boost Phase”, Team SBL-IFX, http://www.wslfweb.org/docs/SBLWP.pdf

The best way to counter even a limited number of missiles is through defense in depth. Defense in depth means there will be a number of opportunities to destroy missiles as they are launched and move through the various stages of their flight paths, or trajectories. For National Missile Defense, a land-based, hit-to-kill interceptor is currently being developed to intercept warheads in the middle of their flight paths. There is also discussion and study of using sea-based missile defenses to complement the land-based system. For its part, SBL represents a potential future space-based component of a national missile defense architecture with residual capability that will enhance the planned theater missile defense architecture. Today, theater missile defense is already being pursued in the form of a layered defense. A family of defensive systems will be able to attack short- and medium-range missiles in various stages of their flight. The boost phase, which occurs shortly after a missile is launched, is the first shot defensive systems have at destroying a hostile missile. Presently, the Airborne Laser is the only theater system being developed that will be capable of attacking and destroying a ballistic missile in the boost phase. The boost phase lasts only a few minutes, after which the launcher burns out. The warhead then continues to ascend and travels outside the atmosphere into space during the middle, or mid-course phase, of its trajectory. A typical trajectory looks like an arc. The mid-course comes after boost phase and before the descent phase. It is during the mid-course phase that decoys might be deployed, complicating the defending nation’s ability to intercept the actual warhead. 3 The final phase of a ballistic missile attack occurs when the warhead descends back into the atmosphere toward its target on the ground. Here, in what is also called the terminal phase, the warhead picks up more speed. The critical aspect of an intercept during this final phase is to hit and destroy the warhead before it explodes. It is also important to hit it high enough to avoid any damage from nuclear, chemical or biological debris. The only active defense the United States has deployed today is a slightly upgraded version of the Patriot missile system used in the Gulf War against short-range Scud missiles. This system is not designed to intercept ICBMs, just short-range ballistic missiles. It will be replaced by the PAC-3 Patriot system in 2001, which will be able to intercept short- and medium-range missiles inside the atmosphere during their descent phase, along with cruise missiles. The Navy Area system, based on Aegis cruisers and destroyers, will complement PAC-3, helping to intercept these shorter-range missiles inside the atmosphere.

A2: ground counterplan- layered defense is good

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Conventional power doesn’t check- competitors will challenge us

Daniel **Goure 9**, Ph.D., Lexington Institute, “U.S. Security Strategy and Boost Phase Missile Defense”, 4-3, http://www.lexingtoninstitute.org/us-security-strategy-and-boost-phase-missile-defense1?a=1&c=1129

It is the rest of the Secretary’s proposals that should give one pause. Rather than being progressive, they are regressive. Each of the Services’ advanced weapons programs were truncated or terminated. Secretary Gates declared that “although the U.S. predominance in conventional warfare is not unchallenged it is sustainable in the medium term given current trends.” What he means by this statement is unclear. How long is the medium term? What if current trends do not continue? Regaining conventional predominance once lost is much more difficult than simply maintaining it. Secretary Gates' decisions will hamstring the Services' ability to meet the challenges of which he spoke at the end of the so-called medium term. Competitors will be encouraged to pursue conventional arms races, placing future U.S. security in jeopardy.

Ground based doesn’t solve- few tests and can’t overcome “limited attacks”

**Wright 10** – David Wright, senior scientist and co-director of the Global Security Program at the Union of Concerned Scientists (UCS). Expert on missile defense, August 9, 2010, “All Things Nuclear,” Insights on Science and Security, “Dangerous Definitions,” http://allthingsnuclear.org/post/927606161/dangerous-definitions

What about reliability? The test record of the GMD system is not good enough to claim the defense is reliable, even against missiles without countermeasures. The system has had few intercept tests under a very limited set of conditions. And even in that case the test record has not been great. The Pentagon has only conducted six intercept tests of the GMD system since the decision to field the system was made in December 2002, and half of those have failed. So even with a creative definition of “limited attacks” the statement that the U.S. is “currently protected” is not true.

What about the statement that the Aegis missile defense system is “proven”? The current Aegis interceptor (SM-3 Block 1A), is intended to intercept missiles up to about 1,500 km range. The Pentagon considers the Aegis anti-missile system “proven” – even though it has not been tested against missiles with countermeasures – because it defines the threat Aegis may face to be missiles without countermeasures. The argument seems to be that the most likely threat from Iran is an attack by potentially large numbers of conventionally armed missiles, to which Iran would not bother to add countermeasures, even if it could make them.

This argument is questionable for various reasons. Even if this is the threat, the statement that Aegis is “proven” is not true in any meaningful sense. As with the GMD tests, the Aegis tests have been done under a limited set of controlled conditions, and to argue that this means the system is “proven” against attacks under other conditions is wishful thinking, and should not be the basis of military planning.

Unilateral pursuit of space missile defense is key to solve deterrence

Frederick 9 – Lt Col Lorinda A. Frederick, USAF, BA, Michigan State University; MBA, Regis University; Master of Military Operational Art and Science, Air Command and Staff College; Master of Airpower Art and Science, School of Advanced Air and Space Studies, 9/1/09, “Deterrence and Space-Based Missile Defense,” Air and Space Power Journal, Fall 2009

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SBMD is the most effective way to protect from an EMP attack which would destroy electronic infrastructure and create irreversible damage for the US, only boost phase intercept capabilities would solve

Lambakis 7 – Dr. Stephen J. Lambakis, February and March 2007, National security and international affairs analyst specializing in space power and policy studies, “Missile Defense from Space,” The Hoover institution, http://www.gees.org/documentos/Documen-02177.pdf

It is also known that enemies of the United States can put a nuclear weapon over U.S. territory using a ballistic missile. The detonation of this weapon at a high altitude could unleash an electromagnetic pulse that would wipe out satellite and airborne navigation, intelligence, and communications systems and impede any U.S. military response to the aggression. Such a pulse of energy would disable or destroy the unprotected technological infrastructure of a region or the nation. According to the emp Commission, “a regional or national recovery would be long and difficult and would seriously degrade the safety and overall viability of our nation. . . . [A]t some point the degradation of infrastructure could have irreversible effects on the country’s ability to support its population.” Space-based interceptors may be the only effective way to counter this threat and mitigate the effects of an electromagnetic pulse resulting from the intercept. Engaging the missile close to its launch point would release the resulting explosion of gamma rays closer to the attacker’s territory. Relying on an intercept in space, in the midcourse of a missile’s flight, risks damaging unprotected satellites (i.e., just about all commercial and civilian satellites), regardless of who owns them

Boost phase intercept capabilities deter adversaries from launching an EMP attack and are more cost effective than “hardening” all of our infrastructure

Spencer 4 – Jack Spencer, Senior Policy Analyst for Defense and National Security in the Kathryn and Shelby Cullom Davis Institute for International Studies at The Heritage Foundation, 8-3-04, “The Electromagnetic Pulse Commission Warns of an Old Threat with a New Face,” The Heritage Foundation, http://www.heritage.org/research/reports/2004/08/the-electromagnetic-pulse-commission-warns-of-an-old-threat-with-a-new-face

The surest way to protect the United States from a high-altitude EMP is by deploying a ballistic missile defense system that can intercept and destroy a warhead before it could be detonated above the U.S. This would prevent an EMP attack and eliminate any potential harm to U.S. systems, and it could even deter rogue leaders from considering the use of EMP. Deploying a missile defense architecture that can intercept a missile early in flight (during the ascent phase) would render rogue missiles ineffective, thereby undermining the rationale to use them. Moreover, because protecting America's entire civilian electronic infrastructure is not fiscally feasible and because a ballistic missile is the most likely delivery vehicle for an EMP attack, the most prudent method to protect America is a missile defense system that could destroy a ballistic missile before it reaches U.S. airspace.

Russia/Iran developing tech for EMP attack—SMD is key to prevent that – hardens infrastructure

Institute for Foreign Policy Analysis 9 – Chaired by Dr. Robert L Pfaltzgraffi Jr., Shelby Cullom Davis Professor of International Security Studies, and Dr. William R. Van Cleave Professor Emeritus at Department of Defense and Strategic Studies Missouri State University, 2009, “Missile Defense, the Space Relationship, and the Twenty-First Century” Independent Working Group, online: www.ifpa.org/pdf/IWG2009.pdf

Notably, Russia has considered attack options that include EMP. During the May 1999 NATO air campaign against Serbia, members of the Russian Duma, meeting with U.S. congressional counterparts, reportedly speculated about the paralyzing effects of an EMP attack on the United States.89 To amplify on the Rumsfeld statement cited under "Ship-borne Scud Threat," above, Iran is reported to have tested whether its ballistic missiles, such as the Shahab-3 or the Scud, could be detonated by remote control while still in high-altitude flight. The most plausible explanation for such tests is that Iran is developing the capability to explode a high-altitude nuclear weapon that could destroy critical electronic and technological infrastructures.90 Without an effective missile defense the United States will remain vulnerable to the EMP threat given its extensive dependence on high-tech, electronic infrastructure that cannot easily be hardened to withstand such an attack. The ability to launch an incapacitating EMP strike against the United States provides enemies with an asymmetric threat that would not only inhibit U.S. military action but would also strike a severe economic and psychological blow.

# Das

## AT- Politics

Key republicans support missile defense improvements

**Fly 11** – Jamie Fly, Bush administration at the National Security Council (2008-2009) and in the Office of the Secretary of Defense, January 3, 2011, “ After New START, Obama must move forward on missile defense,” http://shadow.foreignpolicy.com/posts/2011/01/03/after\_new\_start\_obama\_must\_move\_forward\_on\_missile\_defense

In two of these areas, Sen. Kyl and his colleagues did yeoman's work by prodding the administration to improve nuclear and missile defense policy. Through months of negotiations, he extracted a commitment from the Obama administration to provide $84.1 billion of funding over the next ten years to ensure that the aging U.S. nuclear stockpile is modernized. And during the final days of the Senate debate, Sen. Kyl, joined by Sen. McCain and others, obtained assurances from Obama regarding his long-term commitment to develop effective missile defenses.

Politics link turn- bipartisan support

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

After more than 60 years of advances in ballistic missile technologies, we have only just begun to address our vulnerability to them. Missile defense is a policy and budgetary reality today, and it enjoys strong bipartisan support. Current U.S. efforts to dissuade other countries from investing in ballistic missiles, to assure U.S. allies, and to deter aggression put missile defense in a place of prominence. Bush Administration policy is to evolve the fielded system incrementally to defend against these threats. The system is intended to adapt to new threats as they emerge and integrate advanced missile defense technologies as they are introduced.

A2: Flip-Flop Link- the plan was Obama’s original statement

**Fly 11** – Jamie Fly, Bush administration at the National Security Council (2008-2009) and in the Office of the Secretary of Defense, January 3, 2011, “ After New START, Obama must move forward on missile defense,” http://shadow.foreignpolicy.com/posts/2011/01/03/after\_new\_start\_obama\_must\_move\_forward\_on\_missile\_defense

The suspect timing of the announcement, just as the administration was attempting to conclude negotiations with Moscow on New START and the bungled handling of the rollout raised further concerns that the administration was willing to barter away missile defense in an effort to overcome Russia's longtime opposition to U.S. missile defense. The treaty text signed by Obama contributed to conservative angst by linking offensive and defensive weapons in the preamble, a linkage that Russia had long sought but that the Obama administration insisted would not affect its future missile defense plans.

President Obama reaffirmed this position in a letter to Senate Majority Leader Harry Reid during the Senate debate on New START, his strongest statement to date on missile defense. The president wrote that "as long as I am president, as long as the Congress provides the necessary funding, the United States will continue to develop and deploy effective missile defenses to protect the United States, our deployed forces, and our allies and partners." The president also reaffirmed his commitment to fully implement all four phases of his new missile defense plan in Europe, including the fourth phase, which will involve interceptors capable of defending against long-range Iranian systems -- the phase that Russian officials may have had in mind when they threatened to withdraw from the treaty if the United States develops its missile defense system quantitatively or qualitatively. Despite these commitments regarding funding for nuclear modernization and continued expansion of missile defenses, the administration will now have to follow through on its promises.

Public link turn- they will like the plan

**Lambakis 7** – Steven Lambakis, pHd, national security and international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

Critics contend that weapons in space would destabilize existing security relationships, precipitate an arms race, undermine U.S. foreign policy, and seed anti-American coalitions. Not only are such criticisms based on questionable assumptions,2 but they also have not persuaded the country to forgo the advantages of space weapons. The most one could say at this stage is that the American people are indifferent, noncommittal, and confused.

Yet given the efficiencies space offers, and given the unpredictable, catastrophic, and global nature of threats we expect to face, it makes sense to explore the possible benefits of taking other combat missions to space. Once the benefits of active space defense programs and operations are made plain, the support of the American people will be forthcoming.

Republicans like the plan- view it as critical to security

Brinton 10 – Turner Brunton, Washington Staff Writer, Reporter: Military Space, Missile Defense, September 27, 2011, “GOP Pledges To Fully Fund Missile Defense,” http://spacenews.com/policy/100927-gop-pledges-fund-missile-defense.html

Republican members of the U.S. House of Representatives on Sept. 23 unveiled a new “Pledge to America” policy agenda that includes freezing nonmilitary spending and restoring missile defense funding that it says is needed to protect the United States from a ballistic missile attack from Iran.

“There is real concern that while the threat from Iranian intercontinental ballistic missiles could materialize as early as 2015, the government’s missile defense policy is not projected to cover the U.S. homeland until 2020,” the document states. “We will work to ensure critical funding is restored to protect the U.S. homeland and our allies from missile threats from rogue states such as Iran and North Korea.”

Statement from Senator Kyl: We’re moving in the wrong direction in terms of missile defense

Huessy 11 – Peter R. Huessy, Senior Defense Associate, National Defense University Foundation, April 16 2011, Transcript from Senator Kyl, “Kyl Transcript: Senate Perspectives on Iran, Missile Defense and Nuclear Deterrence,” http://bigpeace.com/phuessy/2011/04/16/kyl-transcript-senate-perspectives-on-iran-missile-defense-and-nuclear-deterrence/

Finally, let’s talk about missile defense. This is really headed in the wrong direction. The United States seems to, and this is the administration, seems to have decided that its primary goal in missile defense is to make sure the Russians are not offended. Their policy has been to curtail defense of the homeland, our U.S. strategic or homeland missile defense requirements in favor of regional missile defenses insofar as those do not offend the Russians.

Now of course regional defenses are necessary, but they are not sufficient, especially at the expense of defending our homeland. But because any force that we would deploy, that could theoretically be effective against a Russian missile, will offend the Russians, then this administration is bound and determined not to go forward with it. That’s very dangerous.

Obviously the administration believes this is important to its reset. I have not seen a lot of evidence that this reset has really benefitted the United States. but I guess we can argue that another time.

Kyl has pushed for the plan in the past

Nukes of Hazard 7 – Project of the Center for Arms Control and Nonproliferation, October 8, 2007, “Senator Kyl Attempts to Sell Space-Based Missile Defense as Satellite Protection,” http://nukesofhazard.blogspot.com/2007/10/senator-kyl-attempts-to-sell-space.html

Last week, Senator Jon Kyl (R-AZ) attempted to amend the Senate Defense Appropriations bill to re-insert funding for the "space-based test bed" -- preliminary research into the development of three or more prototype weaponized satellites designed to intercept ballistic missiles launched from the ground. Kyl's case for funding the project was that it was a step towards the development of active defenses for American satellites against anti-satellite weapons, and that it was not necessarily a missile defense project. However, an examination of the budget request for the test bed casts serious doubt on Kyl's argument, indicating that the test bed is quite simply a missile defense program.

Kyl is the Michael Jordan of Congress

**Barnes 2011** Fred, Jon Kyl’s Retirement: Major Loss for Senate Republicans, Fred Barnes is executive editor of The Weekly Standard, which he cofounded in 1995. From 1985 to 1995, he was senior editor and White House correspondent for the New Republic. graduated from the University of Virginia and was a Neiman Fellow at Harvard University. 2-10-11

For Republicans, losing Senator Jon Kyl of Arizona is a bit like the Chicago Bulls when Michael Jordan retired. Not only is Kyl the MVP among Republican senators, but he also makes the other senators look good and perform better. I can’t think of a member of Congress who will be missed more than Kyl when he retires in 2012.

Kyl has three great strengths. One is his knowledge of issues.  He knows more about more subjects – from missile defense to the minutiae of health care – than almost anyone else in Congress. And knowledge is power.

Another is his strategic sense. Kyl has a good grasp of how various issues fit into the mosaic of his party’s political ideology. I’ve talked to him many times and always been impressed by this. He’s a serious conservative thinker on policy.

Plan is massively unpopular in congress

Kyl 8 – Jon Kyl, Senate minority whip, Speech before the American foreign Policy Council’s conference on “Missile Defenses and American Security,” “Missile Defense Priorities: The View From Congress,” March 10, 2008

There is something else that we should have learned from the Chinese anti‐satellite test in January of 2007. Some in Congress, many in Congress on the other side, believe that there is an artificial barrier between missile defense and space. This is the so‐called “weaponizing space” argument. But the two concepts are inseparable. They are not viewed as separate by an intercontinental ballistic missile traveling through space to reach a target. That is, clearly, a weapon in space. And, yet, when I tried to restore just $10 million for a study of the so‐called space test bed last year, colleagues raised this issue as if we were trying to start World War IV.

## AT- Spending

No new spending or trade-offs from the plan

Dolman 10- Everett Dolman, PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies, September 2010, “The Case for Weapons in Space: A Geopolitical Assessment” APSA Annual Meeting, pg 27

The fiduciary and social costs to weaponize space effectively will be immense. These are necessary costs if America, or any other state, is determined to have a military force structure that relies on space support and enablement to operate as it does now, increasingly so for the future. And it will have benefits for the military that may not be readily apparent; for where will the money come for this space weapons capacity? It will not come from school budgets or foreign aid programs. It will not come at the expense of health care reform or corporate bailouts. **It will come from existing or planned military budgets**, from the capacity of conventional military capabilities on the land and sea and in the air. There will be fewer aircraft carriers and high dollar aircraft fighters and bombers. If space weapons capable of targeting the earth are deployed, relatively slow moving ships and aircraft will be conceptually obsolete, instantly vulnerable to them. As money is scrounged for space lasers and exotic kinetic kill satellites, the systems these space weapons make defenseless will be scrapped. More funding will come from current ballistic and anti-ballistic missile development and deployment, as global ballistic missile defense from space is more cost and practically effective than comprehensive ground or sea-based systems. And most importantly, it will come from personnel reductions, from ground troops currently occupying foreign territory. In this way, America will retain its ability to use force to influence states around the world, but it will atrophy the capacity to occupy their territory and threaten their sovereignty directly. The era of US hegemony will be extended, but the possibility of US global empire will be reduced.

16 billion

Wood et. Al 9- Drs. Lowell Wood, Ed English, Lyn Pleasance and Arno Ledebuhr who principals in conducting the Brilliant Pebbles and Clementine programs contributed in writing the appendix. Report chaired by Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Appendix I: The Legacy of Brilliant Pebbles, Clementine, and Iridium for Future Space-Based Missile Defenses”, in the report “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. I68

Brilliant Pebbles as specifically designed in 1990 couldn’t be reproduced these days, as many of the key technologies have so modernized that their 1990 versions are found only in technology museums. As would be expected from considering consumer-familiar features of the ongoing Silicon Revolution, such key pebbles technologies have become somewhat smaller, lower mass, less power-consumptive and less expensive over the 14-year interval since the pebbles design was ‘frozen’ by the Bush-41 DoD – but they typically express more than a hundred-fold improvement in performance. A modernized pebble thus would be somewhat smaller, lower-mass and less expensive than the ‘Government Pebble’ of a decade-and-a-half ago – and would offer far greater military performance in its sensing, data-processing, and communications sub-systems. The present- day total life-cycle cost of the Bush-41 pebbles GPALS missile defensive system, as then designed-and-operated, would be of the order of $16 billion (2006 dollars).

5-10 billion

Wood et. Al 9- Drs. Lowell Wood, Ed English, Lyn Pleasance and Arno Ledebuhr who principals in conducting the Brilliant Pebbles and Clementine programs contributed in writing the appendix. Report chaired by Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Appendix I: The Legacy of Brilliant Pebbles, Clementine, and Iridium for Future Space-Based Missile Defenses”, in the report “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. I60

Since withdrawing from the Anti-Ballistic Missile (ABM) Treaty in 2002, the United States is no longer legally precluded from acquiring highly effective space-based interceptor defenses, moreover in a very short time-interval. The primary impediment to doing so arises from lack of political will, rather than diffcult or costly technical challenges. The needed technology was developed during the Reagan and Bush-41 administrations (1984-1992), was abandoned by the Clinton administration in 1993, and has not yet been revived. At best, there have been hints that the current administration may initiate a plan to begin a “space-based testbed” in a future administration, sometime in the next decade. Such plans often reflect a false view that space-based interceptor systems are much more complex and costly – or less “technically ready” – than ground-based defenses, which are the primary focus of ongoing missile defense programs. But that premise does not square with history, which should be reviewed from time to time to make clear that the choice for not giving the American people the benefits of space-based defenses is purely a political decision – made quite deliberately by the past two administrations, indicating the bipartisan nature of the political aversion to building effective space-based defenses.

Current missile defense programs are often traced to the Strategic Defense Initiative (SDI), launched by President Ronald Reagan in his March 23, 1983 speech and the Strategic Defense Initiative Organization (SDIO) formed in April 1984. But, while many SDI programs indeed have descendants in ongoing missile defense programs, notably missing since 1993 is any serious effort to consider space-based defenses, which were previously crucially important – literally, primal – to the overall layered defense architecture.1 In particular, as discussed below, space-based interceptors were easily the most innovative, most mature, cost-effective defense system to result from the $30 billion invested in the SDI during the Reagan and Bush-41 administrations.2 The following discussion briefly traces the evolution of space-based interceptors during the SDI era and relevant technology demonstrations through the mid-1990s, when all the needed technologies were demonstrated such that there can be little objective doubt of the SDI claims for spacebased interceptor systems. Since then, technology outside of Department of Defense (DoD) missile defense programs has advanced several generations, so great confidence can be placed in building and deploying a highly-effective spacebased defense within 5 years for $5-10 billion, as soon as it is politically correct to initiate such development.

19 billion

Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 28-29

Brilliant Pebbles Cost Estimates Then and Now Prior to a 1990 milestone assessment by the Defense Acquisition Board (DAB), the Strategic Defense Initiative Organization (SDIO),17 the U.S. Air Force, other Defense Department organizations such as the Defense Science Board, and the JASON18, conducted rigorous technical, operational, and cost studies in the 1989 “season of reviews” for the Brilliant Pebbles program. In addition, the Cost Analysis Improvement Group (CAIG) in the Offce of the Secretary of Defense carried out a detailed, in-depth Brilliant Pebbles cost assessment. The CAIG prepares independent lifecycle cost estimates for major defense acquisition programs prior to major milestone reviews such as the DAB, while concurrently reviewing cost estimates prepared by a system program offce such as the MDA (or the SDIO, as it was then called). These analyses are the foundation of the IWG report’s cost estimates for the original and a revised BP program as set forth below.

Brilliant Pebbles Costs as a Part of Phase I and GPALS As illustrated in the following schedule of events from an August 1990 briefing to the DAB by SDIO’s Brilliant Pebbles task force, the thorough in- and out-of-government 1989 reviews, involving tens of man-years of senior technical and programmatic review and analysis, found no “show stoppers” and led to a January 1990 decision to proceed with the Brilliant Pebbles program as the basic SBI component of the Phase I architecture. The “no show-stoppers” conclusion was significant – especially from the JASON, an elite advisory group not noted for its advocacy of missile defense programs – because of the intensive “red team” analyses to which the Brilliant Pebbles system was subjected, including the most advanced offensive countermeasures that could have been developed against Brilliant Pebbles. Based on the various CAIG-approved cost assessments in 1989 and the technical viability of the proposed architecture, the DAB fully approved the Brilliant Pebbles SBI system in 1990. The CAIG-approved estimate was that 1,000 Brilliant Pebbles interceptors (or BPs) could be developed, tested, deployed, and operated for twenty years (replacing each pebble once during that 20-year period) with a low to moderate risk, event-driven acquisition program for $11 billion in 1989 dollars, or about $19 billion when inflated to 2008 dollars. Both contractor teams, Martin Marietta and TRW-Hughes, indicated their willingness to accept a firm fixed-price contract to deliver at these CAIG-estimated costs, contingent on continued streamlined management by the Brilliant Pebbles task force. Table 2-2 breaks down these 1989 cost estimates and adjusts them to account for inflation. Research, development, testing, and evaluation (RDT&E) and other government added costs in 1989 dollars were estimated at $7.35 billion – $12.78 billion in 2008 dollars. The 20-year life-cycle operating cost estimate was $2 billion in 1989 dollars – $3.48 billion for 2008 dollars. Estimated 1989 production costs were $425 million for 1,000 pebbles, or $425,000 for each pebble. We assume that it would be necessary to replace each pebble once over a 20-year operations period. This would double these estimates to $850 million for 2,000 pebbles in 1989 dollars, resulting in a 2008 figure of $1.47 billion. Finally, each individual pebble weighed between 1.4 and 2.3 kilograms, exclusive of fuel, and was to be housed in a protective cylinder, or “life jacket,” in all about 102 centimeters long19. A fully fueled pebble would weigh approximately 45 kilograms, including its life jacket. Because of the relatively small size and mass of each pebble package, the launch cost for the 1,000-BP architecture was far less than cost estimates for other types of heavier space-based interceptors previously considered – and apparently considered more recently to present (incorrectly) the current state-of-the-art possibilities (more below). Based on the intensive 1989 season of reviews and the planned use of highly reliable Delta or Atlas launch systems20, the estimated launch cost per BP was $400,000 and $660,000 in 1989 and 2008 dollars, respectively; for a constellation of 1,000 BPs, and to replace each once, was $800 million in 1989 dollars – or $1.32 billion in 2008 dollars21.

CBO cost estimates wrong

Uses wrong design assumption

80% high

Consistent with original estimates

Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 78

For example, a July 2004 Congressional Budget Offce (CBO) report, called “Alternatives for Boost-phase Missile Defense,” estimates that costs could reach upwards of $78 billion for the most effective option (out of five options studied) for a 20-year space-based operating system – very expensive because of the weight of the components assumed in the study, that is, the heavier the kill vehicle (KV), the bigger the booster required to deliver the KV into space and the greater the cost. This compares with $19.1 billion (in 2008 dollars) for the Brilliant Pebbles system discussed extensively in section 2.8

The 50-page CBO report, which drew heavily on a 400-page 2003 boost-phase study by the American Physical Society (APS), doubtless is essentially correct in its $78 billion cost projections in terms of the technology it looked at. And therein lies the rub: the design assumptions used in both the CBO and APS calculations include heavier components than those used in the GPALS system, which was technologically feasible well over a decade ago. When combined with the rocket equation and the fundamentals of orbital mechanics, the use of available lightweight technologies – including significant progress in miniaturization during the past decade – should reduce the CBO/APS cost estimates by over 80 percent to a figure consistent with the 1990 GPALS estimate.

## AT: Debris DA

No debris--- weapons clean them up

Dolman 6—Everett Carl Dolman, PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies, March 10, 2006, “Toward a U.S. Grand Strategy in Space” George Marshall Institute, pg 26-27

Question: This is a question for Dr. Dolman. You just mentioned previous hegemonies, but all of those hegemonies are no longer extant. What is the risk to the U.S. in pursuing this strategy, by taking all these resources up to space? What are the implications for U.S. hegemony if they are destroyed and space is filled with debris and there are no chances for exploration or no chances for going beyond?

Dolman: Well, I think that some assumptions that you made are extremely problematic. You know, the Soviet Union launched twenty ASATs into space and those were the worst kind of ASAT you can imagine. They were essentially shotgun shells of hundreds of bits of debris smashing into other satellites. Did that cause a debris problem? No, because it is a planned orbital mechanics issue that the kinetic force of that engagement goes into the atmosphere and debris is burned up on reentry- There are **thus** ways to use **weapons in space** that **don't really cause a debris problem, and there are ways to use them that actually clean up space in orbit**. But also I agree with you. No hegemon, no empire, no state or business lasts forever. Does that mean that we should accelerate our own decline? No. It is important to do things to extend it. The United States inevitably will lose its power relative to the rest of the world, so it needs to set up the conditions that are seen as beneficial around the world in such a way that whoever replaces the United States is going to be in the same sort of liberal mode that the United States had been, the same type of benevolent hegemon or follow-on power. What it cannot do is set up a situation where the next power is likely to be antithetical to those ideas. What I am talking about is extending the period of American hegemony into the foreseeable future, not creating a permanent empire in that sense, but continuing to have a situation where there is a power to create and enforce some sort of order.

## AT: Arms/Space Race DA

Weaponization prevents arms races

Dolman 6—Everett Carl Dolman, PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies, March 10, 2006, “Toward a U.S. Grand Strategy in Space” George Marshall Institute, pg 24

Nonetheless, we have a different system today and, as Karl has pointed out, it may be that if the United States were to unilaterally militarize space - and I am not advocating that necessarily, but it is an option - that it could in fact prevent an arms race. The trillions of dollars that would have to be spent to dislodge the United States from space, if it were to quickly seize control of the low-earth orbit, might be seen as not worthwhile to another state. However, if we wait fifteen or twenty years until a state is able to challenge the United States in space, then we will have a space race. By putting weapons in space to enhance its military capabilities the United States today is saying to the world that in this period of American hegemony, it is not going to wait for problems to develop overseas until they bubble over into its area of interest, and then massively and forcefully fix that problem. No. The American way of war today, based on precision and on space capabilities, is to engage early using less force, using more precise force and more deadly force in a specific area, but with far less collateral damage. That is the new American way of war and we really cannot get out of it.

Weapons will be perceived as peaceful

Dolman 10- Everett Dolman, PhD and Professor of Comparative Military Studies at the US Air Force's School of Advanced Air and Space Studies, September 2010, “The Case for Weapons in Space: A Geopolitical Assessment” APSA Annual Meeting, pg 28

Hence, the argument that the unilateral deployment of space weapons will precipitate a disastrous arms race is further eroded. To be sure, space weapons are offensive by their very nature. They deter violence by the omnipresent threat of precise, measured, and unstoppable retaliation. But they offer no advantage in the mission of territorial occupation. As such, they are far less intimidating to the international environment than any combination of conventional weapons employed in their stead. What would be more threatening to a state in opposition to American hegemony: a dozen lasers in space with pinpoint accuracy, or (for about the same price) a dozen low-tech infantry divisions massed on its border? A state employing offensive deterrence through space weapons can punish a transgressor state, but it is in a poor position to challenge that state's sovereignty. A transgressor state is less likely to succumb to the security dilemma if it perceives that its national survival is not at risk. Over time, the world of sovereign states may recognize that the United States could not and would not use space weapons to threaten another country's internal self-determination. The United States would still maintain the capacity to challenge any attempts to directly intervene in the politics of others, and it would have severely restricted its own capacity to do so. Judicious and non-arbitrary use of a weaponized space eventually could be seen as a net positive, an effective global police force that punishes criminal acts but does not threaten to engage in an imperial manner.

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Peaceful purposes is determined by aggressive intent

**Lambakis 7** – Steven Lambakis, pHd, national security anmd international affairs analyst specializing in space power and policy studies for National Institute for Public policy, February 19, 2007, “Missile Defense From Space,” RealClearPolitics, http://www.realclearpolitics.com/articles/2007/02/missile\_defense\_from\_space.html

Washington supports exploration and use of outer space by all nations for peaceful purposes. "Peaceful purposes," states U.S. policy, allow defense and intelligence-related activities in pursuit of national security and other goals. Determining peaceful purposes, in other words, is done not by looking at whether an activity is military or nonmilitary. The determining factor, rather, is more directly tied to aggressive intent.

Ground CP

Ground based BMD would be able to over come current problems

Frederick 9 – Lt Col Lorinda A. Frederick, USAF, BA, Michigan State University; MBA, Regis University; Master of Military Operational Art and Science, Air Command and Staff College; Master of Airpower Art and Science, School of Advanced Air and Space Studies, 9/1/09, “Deterrence and Space-Based Missile Defense,” Air and Space Power Journal, Fall 2009

After the Cold War, deterring ballistic missile threats became more complicated due not only to the increasing numbers of nuclear-capable states but also to the rise of hostile rogue elements within a state as well as the proliferation of weapons of mass destruction (WMD), along with missile technology and expertise.6 According to joint doctrine, “the predominant threat is not from a competing superpower, but more likely from the deliberate launch of a ballistic missile from a ‘rogue state,’ failed state, or terrorist group.”7 Yet, the United States has difficulty tracking ballistic missiles due to the shortage of accurate and reliable intelligence**,** having “been surprised in the past by an opponent’s earlier-than-expected military technology, including the testing of the Soviet hydrogen bomb, the testing of missiles by Iraq and North Korea, and the acquisition of Chinese missiles by Saudi Arabia.”8 Consequently, the “proliferation of advanced technologies for missiles, guidance systems, and WMD warheads *has increased the potential missile threat to the homeland*” (emphasis in original).9 Today, the United States must attempt to deter both state and nonstate actors.Nonstate actors and rogue elements complicate deterrence for a number of reasons.10 First, rogue elements’ decision makers are harder to identify and locate**,** let alone deter, than their state counterparts. Without the ability to attribute the use of WMDs to a rogue-element actor, or even its state sponsor, the United States may have difficulty deterring an attack. Leaders of rogue elements and proliferators threaten US, regional, and global security interests because they defy international laws or norms of international behavior and use asymmetric means to attack law-abiding nations.Second, the fact that states operate more in the open allows the United States to gauge their perceptions, based on their actions: “The objective of deterrence is to convince potential adversaries that courses of action that threaten U.S. national interests will result in outcomes that are decisively worse than they could achieve through alternative courses of action.”11 Because rogue elements do not operate in the open, the United States cannot accurately gauge their perceptions of capability and will.Third, the United States cannot threaten to inflict substantial costs on rogue elements that have few high-value assets, minimal territorial claims, and small populations, compared to their state counterparts.12 An adversary’s hidden calculation of cost, benefits, and risks complicates the US approach to deterrence.Fourth, it may prove difficult to discern what is important to rogue elements. The United States could easily assume that they share its goals and values—but this is a dangerous assumption.Fifth, the United States has neither established nor exercised communication channels with rogue elements to the same extent that it has with state actors**.** Communication is a necessary component of deterrence strategy with regard to relaying the United States’ intent to respond to aggression. Even after receiving a clear message, rogue elements may not be deterred. BMD could help the United States deter aggression and respond should deterrence fail.BMD should primarily be considered a vital part of a deterrent strategy and secondarily an effective tool to protect against ballistic missile attacks. BMD is an integral part of deterrence because it makes escalation less likely. Confidence in BMD technology may allow US decision makers to accept an increased risk of attack and allow time for other instruments of power to defuse the situation. Adversaries must consider US defensive capabilities in relation to their offensive capabilities. Confident that inbound ballistic missiles will not reach the homeland, the United States could choose not to respond in kind to such provocation**.**Extending BMD to friendly states bolsters deterrence because it effectively conveys to potential aggressors the US commitment to defense. Extended deterrence can keep other states out of the conflict. For example, the United States provided Israel with theater missile defense (TMD) during Operations Desert Shield and Desert Storm to protect the Israelis and keep them out of the broader conflict. Extended deterrence may encourage allies to “forgo indigenous development or procurement of duplicative military capabilities, thereby enhancing US counterproliferation efforts.”13 BMD is more than just a defensive measure that the United States possesses to knock down threatening missiles. Decision makers should think of it as a vital part of deterrence to help restrain rogue elements and proliferators.

Russia D/A- START

Current START treaty limits our missile capabilities

Spring 5-3-11 – Baker Spring, F.M. Kirby Research Fellow in National Security Policy at The Heritage Foundation, “Sixteen Steps to Comprehensive Missile Defense: What the FY 2012 Budget Should Fund,” The Heritage Foundation, http://www.heritage.org/Research/Reports/2011/05/Sixteen-Steps-to-Comprehensive-Missile-Defense-What-the-FY-2012-Budget-Should-Fund

Administration officials constantly asserted during the Senate debate over New START that the treaty did not limit U.S. missile defense options.[13] Not only was this factually incorrect because the treaty limits the U.S. option to convert strategic offensive missile launchers into defensive interceptors, but the treaty also restricts the handling of certain types of target missiles in ballistic missile tests, and its preamble imposes general restrictions on U.S. missile defense options.

Neg Answers

Status Quo solves- recent budget deals

The Economist 10 – “Moon dreams The Americans may still go to the moon before the Chinese,” Feb 18 2010, print edition, http://www.economist.com/node/15543675

WHEN America’s space agency, NASA, announced its spending plans in February, some people worried that its cancellation of the Constellation moon programme had ended any hopes of Americans returning to the Earth’s rocky satellite. The next footprints on the lunar regolith were therefore thought likely to be Chinese. Now, though, the private sector is arguing that the new spending plan actually makes it more likely America will return to the moon.

The new plan encourages firms to compete to provide transport to low Earth orbit (LEO). The budget proposes $6 billion over five years to spur the development of commercial crew and cargo services to the international space station. This money will be spent on “man-rating” existing rockets, such as Boeing’s Atlas V, and on developing new spacecraft that could be launched on many different rockets. The point of all this activity is to create healthy private-sector competition for transport to the space station—and in doing so to drive down the cost of getting into space.

Eric Anderson, the boss of a space-travel company called Space Adventures, is optimistic about the changes. They will, he says, build “railroads into space”. Space Adventures has already sent seven people to the space station, using Russian rockets. It would certainly benefit from a new generation of cheap launchers.

Space X will go to Mars despite previous set backs

**http://www.dailytech.com/SpaceX+Sets+Sights+on+Launches+Dreams+of+Mars/article22169.htm**

The millionaire brainiac behind the Space Exploration Technologies (SpaceX) program has high ambitions of future private space exploration. Founder Elon Musk seeks a trip to the Red Planet of Mars before NASA's mid-2030s current projected timeframe.

Of course, Musk and SpaceX have delayed projects and failed tests in the past, but have shown great promise in current projects. SpaceX also continues to collect funds from NASA and other contractors looking to help go into space.

Status Quo solves- Falcon Heavy will spur other launches

http://www.popularmechanics.com/science/space/rockets/tech-behind-new-spacex-falcon-heavy-rocket-5518955

The Falcon Heavy could have major space business implications. A cheaper launch cost could bring in customers that were priced out before, and the extra payload capacity could entice new customers, too. That could include the Air Force and NASA. While the Falcon Heavy has only half the capacity of Saturn V, it offers twice the payload of its American competitors—United Launch Alliance's (ULA) Atlas V and Delta IV rockets, and for quite a bit less per launch—at least according to Musk's plan. If the Falcon Heavy really does launch from Vandenberg Air Force Base in California within two years and then from Florida a year later, as Musk promised on Tuesday, the Air Force and NASA will have to think about using a new launch provider for their own satellites, a field pretty much owned by ULA for this payload class to date. ULA may have to innovate—or die. Let's hope it's the former, because SpaceX just opened up the possibilities for a new, robust American launch industry.

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Risk analysis

Even if they win their impact, the benefits to SMD outweigh

Frederick 9 – Lt Col Lorinda A. Frederick, USAF, BA, Michigan State University; MBA, Regis University; Master of Military Operational Art and Science, Air Command and Staff College; Master of Airpower Art and Science, School of Advanced Air and Space Studies, 9/1/09, “Deterrence and Space-Based Missile Defense,” Air and Space Power Journal, Fall 2009

Credible deterrence depends on technological capability and political will. During the Cold War, the United States relied on the nuclear triad to deter ballistic missile threats emanating from the Soviet Union. These capabilities reinforced the political will expressed through policies such as massive retaliation and assured destruction. We had no defense against ballistic missile attacks. Today, the nuclear triad still deters threats from Russia and China; however, the threat has expanded to include rogue elements and proliferators undeterred by Cold War methods. The current land- and sea-based missile defense architecture provides a limited defense against these threats, but it lacks redundancy and depends on the proper positioning of assets to intercept missiles in their midcourse and terminal phases of flight**.**Attaching a monetary figure to SBMD is difficult**.** A cost/benefit assessment should include potential cost savings in other parts of the missile defense architecture in relation to the benefits, including rapid responsiveness, global power projection, and constant presence. The United States must also consider the cost of expanding current missile defense layers to achieve the added deterrent and protective effect that SBMD could provide. Putting a monetary value on deterrence represents the main difficulty of a comprehensive assessment.

The continued proliferation of ballistic missile technology to states and rogue elements warrants increased research into SBMD. The United States should continue to demonstrate the international will necessary to help deter the proliferation of ballistic missiles while providing the capability to defend against rogue elements should deterrence fail.

# Politics

Reasons why BP not implemented now

Worried about space weaponization

* Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 59

Space-based systems: There is little prospect that space-based missile defense will be revived. At most, consideration is being given to limited experiments in the near future and a space test bed. The most likely explanation for this situation lies in the “weaponization of space” debate. According to the logic pyramid, the most promising missile defense technologies – space-based – are subordinated to the requirements of a political consensus against “weaponization of space.” Although they are most technologically feasible, as demonstrated elsewhere in this report, such technologies are least politically acceptable.

Not deploying BP because still respect ABM Treaty

* Pfaltzgraff and Van Cleave et al. 9, Dr. Robert L. Pfaltzgraff, Jr. is Shelby Cullom Davis Professor of International Security Studies The Fletcher School, Tufts University President, Institute for Foreign Policy Analysis, and Dr. William R. Van Cleave is Professor Emeritus Department of Defense and Strategic Studies Missouri State University, with Ambassador Henry F. Cooper Chairman, High Frontier former Director Strategic Defense Initiative Organization former Chief U.S. Negotiator to the Geneva Defense and Space Talks, 2009, “Missile Defense, the Space Relationship, & the Twenty-First Century” The Institute for Foreign Policy Analysis, [www.ifpa.org/pdf/IWG2009.pdf](http://www.ifpa.org/pdf/IWG2009.pdf), p. 67

Thus, 16 years after BMDO[Ballistic Missile Defense Organization] under President Clinton cancelled the Brilliant Pebbles program (December 1, 1993), there is still no appropriation of funds to initiate a space test bed and only a $5 million appropriation in 1991 to study the feasibility of space-based interceptors even though Brilliant Pebbles was formally approved as a major defense acquisition program. Clearly, the MDA[Missile Defense Agency] under President George W. Bush continued the Clinton ban on a space-based interceptor until the last year of his second term, giving credence to Canavan’s suggestion that the MDA still “implicitly respects the ABM [Anti-Ballistic Missile] Treaty.”43 Since budgets reflect real policy sought by an administration, it is diffcult to avoid the question, how long will America operate under the dictates of Mutual Assured Destruction?

Privatization

Privitization cp also benefits to the commercial industry and government co-operation

Stern 10 - S. Alan Stern, NASA's former associate administrator in charge of science, is the chairman of the Commercial Spaceflight Federation's Suborbital Applications Researchers Group., May 17 “Let business handle routine spacefaring; NASA can handle the otherwordly missions” B, COMMENTARY; Pg. 3, http://www.washingtontimes.com/news/2010/may/17/let-business-handle-routine-sp/?page=all

NASA is spending too much of its precious budget on providing routine transport of astronauts to the space station, stymying progress on its more important task of sending astronauts to explore deep space. Fortunately, the administration has proposed a game-changing solution that uses cost-effective private industry to take on the more mundane aspects of human transportation to low-Earth orbit, freeing up needed funds to send astronauts to explore deep space. The administration's wise commercialization approach echoes an immensely successful path taken by NASA in the past. Consider: At the dawn of the space age, all satellites were built and launched by governments. But very early on, communications satellites were encouraged to go commercial. The result: a $100-plus billion spinoff industry that employs thousands of workers to build the satellites, their ground stations, launchers and associated command and control infrastructure, and launches more satellites annually than any other form of space flight. That has opened up NASA resources to do other things with the money saved. But equally importantly, the commercialization of space communications has also generated tens of thousands of direct and indirect private sector jobs, and a strong innovation cycle that's produced continuous improvement across the industry for more than four decades. In contrast, nearly 50 years after the first human flights to orbit by Yuri Gagarin and John Glenn, no commercial human spaceflight yet exists. Few in our parents' generation would have believed this, for at the outset of the space age, the commercialization of human transport to low-Earth orbit was widely expected. Remember the Pan Am shuttle in "2001: A Space Odyssey"? Why has the commercialization of human transport to low-earth orbit been stymied? Are the complexities of communication satellites and commercial human transport really so different? Not fundamentally. Are governments the only entities that can build human spacecraft? No, actually every human spacecraft ever built for NASA was built by private industry. Is the scope of the investment required for human spaceflight too large for private industry? No - large satellite constellations cost more than the commercial crew systems envisioned to take astronauts to and from low-Earth orbit. Of course, there are human lives at stake in space missions with crew, but commercial firms have lives at stake in industries as diverse as trucking, oil exploration, aviation and nuclear power. Why should space travel to destinations closer than most transcontinental airline flights be considered so different? In fact, there really is no fundamental reason that human orbital transport to low-Earth orbit must remain the practice only of governments a full half-century after it began. To the contrary, there are many reasons that the development of private, commercial human space flight vehicles in the United States is desirable for the nation. These include: \* Competition-driven innovation and price pressure that commercial practices foster can only make human space flight ever-more common, and U.S. leadership in this domain ever clearer. \* The spinoff development of related commercial companies supporting space tourism, orbital research stations and future applications pregnant with economic promise for aerospace industry and the United States. \* The generation of thousands of new, high-paying jobs across the U.S. to support commercial space lines. \* And the inherent robustness that comes with having a diverse suite of U.S. manned spaceflight systems to access space. It is only by freeing up NASA from routine human transport to low-Earth orbit that we can afford to once again see American astronauts exploring distant worlds. For this reason, if Congress doesn't adopt the administration's more economical, commercial crew to low-Earth orbit strategy, there is little chance we - rather than the Chinese, Russians and Indians - will be exploring worlds and making history in space in the future. What are we waiting for?

# Case

Tech – Missile Defense allows U.S. to protect other space assets.

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Access to a secure space environment is indispensable if the United States is to deploy a robust, layered missile defense. It is essential not only to assure that the United States will be able to use space for missile defense, but also to develop the means to protect other space-based assets and infrastructure. Space has become an arena of crucial importance to the United States both for commercial purposes and for national security. Just as it must maintain capabilities to defend its interests in the air, at sea, and on land, the United States needs to defend its space-based assets. At the same time we must deny the hostile use of space by our enemies. Just as land, the seas, and the air have been conflict arenas, space is changing how wars are fought and where they will be fought. This section addresses the role of space in twenty-first century U.S. national security strategy and its essential contributions to future missile defense. Space offers unique opportunities for a global missile defense. The obstacles to space-based missile defense lie primarily in the political arena rather than in technological limitations. This section examines issues that must be addressed if the United States is to deploy a missile defense that includes space-based interdiction capabilities. Present U.S. Space Strengths The United States is the leading space power, and as such it depends more on space than does any other nation, a situation that leads inevitably to both vulnerabilities and opportunities. The U.S. position in space has grown out of numerous strengths developed over more than five decades. These strengths fall into two broad, overlapping categories: (1) military force enhancement; and (2) commercial utilization of space. Because of the dual-use nature of these technologies, it is not easy to separate their military applications from their commercial ones. Therefore, the failure of the United States to remain in the forefront of space technologies would have both military and commercial implications. Advances in the military or civilian sectors will overlap, intersect, and reinforce each other. Consequently, the development in the United States of a dynamic and innovative private-sector space industry will be indispensable to future U.S. space leadership. Nevertheless, the ability of the U.S. military to contribute to, and benefit from, such a space technology base will depend on its focus and priorities. The availability of technologies does not lead inevitably to their exploitation. America may fail to move forward to exploit technological opportunities and breakthroughs. Such choices may be based on political or other considerations, whether well founded or the product of mistaken assumptions about what competitors or adversaries will or will not do. Just as control of the seas has been essential to the right of innocent passage for commerce, the ability of the United States to maintain assured access to space and freedom of action in space will depend on space control. Given the already extensive importance of space for commercial and military purposes, as well as its prospective role in missile defense, the United States must maintain control of space in the twenty-first century. This commitment to space control is neither new nor destabilizing, despite claims to the contrary. The Security

Environment in Outer Space

Technology spin-off contingent on U.S. commitment to space- this card says that it could cause a new launch vehicle to be developed- the military sector does not choose whether or not space is militarized

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Governments in turn will rely increasingly on the private sector for a broader range of space products, services, and technologies. While government-sponsored innovation provided the initial catalyst, especially during the Cold War, the private sector will play a growing role in the development of space technologies that have potential military applications in the years ahead. Dual-use space technologies will spin off from the commercial to the military sector in unprecedented ways. This includes areas such as communications and imaging satellites and new launch vehicles as well as telecommunications, the broader availability of imagery, and GPS technologies, products, and services. The private sector will develop new products such as satellites and at the same time offer services such as we see today with telecommunications and imagery. In some cases government programs will produce infrastructure such as satellites and GPS, with the private sector then benefiting from such capabilities. Likewise, the government, including the U.S. military, will contract with the private sector to lease communications and other capabilities. For example, the U.S. military recently contracted with Paradigm Secure Communications, based in the United Kingdom, in an effort to augment the capabilities of the Defense Satellite Communications System (DSCS). The deal, worth up to $48 million over three years, will provide the military with X-band communications using Paradigm’s fleet of Skynet satellites. Currently, the U.S. military receives about 80 percent of its satellite communications capacity from commercial providers. 37 Of course, these basic trends in the growth in a commercial space sector do not guarantee that the United States will be the greatest beneficiary. This obviously depends on strategic choices taken by the United States to exploit such technologies for military purposes. Others bent on benefiting from space technologies will increasingly have access to a global commercial space sector from which they are likely to be capable of spinning off technologies for military purposes if they choose to do so. Therefore, whether or not space is “weaponized” will be increasingly beyond U.S. control as dual-use space technologies become more readily available

NASA needs to lead the way to space colonization

Gavert, 06- <quals>, January 20, 2006, “Lunar Colonization and NASA’s Exploration Changes”, AIP Conference Proceedings [serial online].;813(1):1033-1040.

Because of political, budgetary, technical difficulties and other reasons that emerge among the various spacefaring nations, lunar colonization advocates cannot depend solely on NASA or these other nations to lead the way to colonization of the Moon. Colonization advocates must set their own visions, mission goals and schedules so they can work around the barriers that may block progress by the various nations. At present, there is no single colonization group that can say they are the key advocates for setting a colonization strategy. A non-government international group made up of top financial space enthusiasts, visionary planners, managers, operators, technical experts, and can-do leaders with the spirit of adventure will be needed. These people might come from any place in the world. Dennis Wingo in his book, Moonrush, speaks of the “Silicon Valley” way for going beyond what just government can achieve (2004). There are a group of space capitalists that might be candidates to form the financial backbone of a non-government organization for colonization. These might include, but not be limited to: billionaire Paul G. Allen, co-founder of Microsoft who financed Space Ship One that won the $10 million Ansari X Prize competition; billionaire. Jeffrey Bezos, Chief of Amazon.com who founded an aerospace company called Blue Origin; billionaire Larry Page, cofounder of Google who is on the board of the X Prize Foundation. These people would have to see profitable return possibilities from the lunar activities. This makes sense since the roots of colonization must lie in commerce. Another group of people that would be important to the colonization organization, are the visionary planners, managers, technical operators, and “can-do” leaders. Visionary planners must not only see the technical difficulties and potential solutions but also the commercial opportunities and approaches. Gene Meyers of the Space Island Group’s shops in space would be an example of such planners. Richard Branson, who founded Virgin Airlines and is now pursuing space tourism, would be an example of a manager who can make sure people do what they say they are going to do, yet, stay flexible in an unknown environment. Burt Rutan, who made Spaceship One a low cost prize winning operation, would be an example of a technical expert and operator. Elon Musk, creator of SPACE-X Rocket Company would be an example of a “can-do” leader. Finally, there are the customers like Dennis Tito, and more recently Greggory Olson, who have paid the Russians up to twenty million dollars each for a visit to the International Space Station and a thrill of a lifetime. From this core of outstanding people, the non-government colonization organization would establish a Colonization Council that would oversee the policies, planning, operational management and growth of the lunar colonization organization.

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