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Contention One - Inherency

The Allen Telescope search for extra – terrestrial intelligence has been taken off line die to funding shortfalls

Krieger Reporter for the San Jose Mercury News 4-25-11

(Lisa Reporter for the San Jose Mercury News: “SETI Institute to shut down alien-seeking radio dishes” Lexis 4-25-2011 MLF 6-25-11)

If E.T. phones Earth, he'll get a "disconnect" signal. Lacking the money to pay its operating expenses, Mountain View's SETI Institute has pulled the plug on the renowned Allen Telescope Array, a field of radio dishes that scan the skies for signals from extraterrestrial civilizations. In an April 22 letter to donors, SETI Institute CEO Tom Pierson said that last week the array was put into "hibernation," safe but nonfunctioning, because of inadequate government support. The timing couldn't be worse, say SETI scientists. After millenniums of musings, this spring astronomers announced that 1,235 new possible planets had been observed by Kepler, a telescope on a space satellite. They predict that dozens of these planets will be Earth-sized -- and some will be in the "habitable zone," where the temperatures are just right for liquid water, a prerequisite of life as we know it. "There is a huge irony," said SETI Director Jill Tarter, "that a time when we discover so many planets to look at, we don't have the operating funds to listen." SETI senior astronomer Seth Shostak compared the project's suspension to "the Niña, Pinta and Santa Maria being put into dry dock. "... This is about exploration, and we want to keep the thing operational. It's no good to have it sit idle. "We have the radio antennae up, but we can't run them without operating funds," he added. "Honestly, if everybody contributed just 3 extra cents on their 1040 tax forms, we could find out if we have cosmic company." The SETI Institute's mission is to explore the origin, nature and prevalence of life in the universe. This is a profound search, it believes, because it explains our place among the stars. The program, located on U.S. Forest Service land near Mount Lassen, uses telescopes to listen for anything out of the ordinary -- a numerical sequence of "beeps," say, or crackly dialogue from an alien version of a disembodied "Charlie" talking to his "Angels." The entire program was set up to prove what once seemed unthinkable: In the universe, we are not alone.

Lack of funding But funding for SETI has long been a headache for E.T.-seekers. NASA bankrolled some early projects, but in 1994, Sen. Richard Bryan of Nevada convinced Congress that it wasn't worth the cost, calling it the "Great Martian Chase" and complaining that not a single flying saucer had applied for FAA approval. However, successful private funding came from donors such as Microsoft co-founder Paul Allen, allowing SETI to raise $50 million to build the 42 dishes. Plans called for construction of 350 individual radio antennas, all working in concert. But what's lacking now is funding to support the day-to-day costs of running the dishes. This is the responsibility of UC Berkeley's Radio Astronomy Laboratory, but one of the university's major funders, the National Science Foundation, supplied only one-tenth its previous support. Meanwhile, the state of California has also cut funding. About $5 million is needed over the next two years, according to Tarter. She hopes the U.S. Air Force will help, because the array can be used to track satellite-threatening debris in space. But budgets are tight there as well. Astronomers mourn The Allen array is not the only radio telescope facility that can be used for SETI searches. But it is the best; elsewhere, scientists have to borrow time on other telescopes. Meanwhile, other SETI projects will continue, such as the "setiQuest Explorer" ( www.setiquest.org ), an application that allows citizen scientist volunteers to look for patterns from existing data that might have been missed by existing algorithms. Through a new partnership with "Galaxy Zoo" ( www.galaxyzoo.org ), this project runs in real time, so discoveries can be followed up on immediately. Bay Area astronomers mourned the hiatus of the SETI program and expressed concern about the future. Rob Hawley of the Peninsula Astronomical Society called it "unfortunate. The Allen scope was a wonderful experiment. "... Hubble gets all the press, but there are lots of limitations." Amateur astronomer Sarah Wiehe of Palo Alto said, "just knowing SETI is there was significant for us. This is a setback." "If we miss a distant signal," she added, "it would be a terrible loss." what it means SETI's mission to explore the prevalence of life in the universe, including about 1,235 possible planets recently discovered, is compromised, according to scientists. what's next The program needs about $5 million over the next two years to support the telescope facility.

1AC Plan Text

The United States federal government should fund the Allen Telescope Array.

1AC – Search Adv. 1/

Fully functioning telescope array means contact could happen in the next 25 years

**UPI, source for science news, 10**

(Source for world news, top news, science news, health news and current events, August 16, United Press International, “Scientist: SETi success within 25 years?,” Leixs) KA

The search for extraterrestrial intelligence could yield proof of its existence with 25 years, a U.S. scientist involved in the quest says. Speaking at the SETI Con convention in Santa Clara, Calif., Seth Shostak -- senior astronomer at the Search for Extraterrestrial Intelligence Institute in Mountain View, Calif. -- said, "I actually think the chances that we'll find ET are pretty good," SPACE.COM reported Monday. "Young people in the audience, I think there's a really good chance you're going to see this happen," he said. The SETI search will take a giant step forward when the Allen Telescope Array, a network of radio dishes under construction in northern California, is fully operational, Shostak said. By 2015, the array should be able to scan hundreds of thousands of stars for signs of extraterrestrial intelligence, he said. Detecting an alien signal within 25 years is one thing, but figuring out the message could take much longer, Shostak said. An alien civilization would likely be as technologically advanced compared to us as Homo sapiens are to our hominid relatives Neanderthals, he said. "We could give our digital television signals to the Neanderthals, and they'll never figure it out. And they're not stupid," he said.

Contact with advanced extra –terrestrial intelligence solves all negative impacts

Tough PhD Professor at the University of Toronto 2000

(Allen,: “An Extraordinary Event” 7, http://ieti.org/tough/articles/intro.htmMLF 6-21-11)

This report examines five sorts of long-term consequences that could result from contact. To give you an overview before you read the next chapter, here is the core of each of the five. 1. Practical Information We might well receive practical information and advice that helps our human civilization to survive and flourish. Possible examples include technology, transportation, a new form of energy, a new way of producing food or nourishing ourselves, a feasible solution to population growth, more effective governance and social organization, fresh views on values and ethics, and inspiration to shift direction dramatically in order to achieve a reasonably positive future. The message might also bring home to people the importance of eliminating warfare or at least eliminating weapons of extraordinary destruction. Viewing ourselves from an extraterrestrial perspective might be very useful in reducing our emphasis on differences and divisions among humans, and instead seeing ourselves as one human family. 2. Answers to Major Questions We might gain new insights and knowledge about deep major questions that go far beyond ordinary practical day-to day matters. Topics in an encyclopedia-like message or closeup dialogue could include astrophysics, the origin and evolution of the universe, religious questions, the meaning and purpose of life, and answers to philosophical questions. We might receive detailed information about the other civilization (which might be deeply alien to us) and about its philosophies and beliefs. Similar information could be provided about several other civilizations throughout our galaxy, too. We might even receive a body of knowledge accumulated over the past billion years through contributions by dozens of alien civilizations throughout the galaxy. What sorts of consequences will contact have for our religious ideas and institutions? Some religions may be deeply shaken by contact, or at least need to re-examine their set of beliefs. It seems clear, however, that humanity's religions have already flourished over many centuries despite a variety of scientific discoveries that conflict with religious views. And several religions have already incorporated the idea of extraterrestrial life. Although some religious leaders may denounce an extraterrestrial dialogue, most will surely embrace it as further evidence of God's infinite greatness.

1AC – Search Adv. 2/

Even absent contact, engaging in the search results in uniting humanity

Tough, University of Toronto 98

(Allen, Positive consequences of SETI before detection, Acta Astronautica Volume 42, Issues 10-12, May-June 1998, Pages 745-748)

Cosmic evolution over billions of years has led to our present period, which is characterized by diverse life on Earth and probably throughout the universe. Eric Chaisson calls this period “the Life Era”[2]and Steven Dick calls this view “the biological universe”[3]. The SETI enterprise makes the likelihood of intelligent life throughout the galaxy feel more tangible and real. Instead of just talking or writing about the possibility, someone is actually doing something about it. As a result, humanity is gradually shifting toward a fresh image of who we are as a species. Increasingly we see ourselves as one of the abundantly diverse intelligent species that have arisen in the universe. That is how we fit into the universe. We feel part of the cosmic family; we feel a bond or kinship with others. We are one of the species that have developed a civilization marked by curiosity, inquiry, knowledge, meaning and purpose. We are not alone in the universe. Although we are unique, we may be one of billions of civilizations in the universe (just as each person and each snowflake is unique, but is also one of billions). As they learn about cosmic evolution and SETI activities, more and more people are developing a deeper sense of themselves as citizens of the universe—as part of intelligent life and evolving culture throughout the cosmos. We begin to move from forlorn isolation to a “feeling of genuine biological and spiritual unity with the universe” and that universe feels “friendlier”[4]. We begin to see ourselves within a galactic frame of reference. To use Michael Michaud’s words, we are about to “leave the era of Earth history, and enter an era of cosmic history”[5]. More recently he noted that “many of us are involved in SETI because we hope that detection, and even the search itself, will introduce a new and positive factor in human affairs. We are involved because SETI defines us as a species with shared interests. We are involved because SETI forces humanity to think big”[6]. According to Frank White, SETI may be, at its deepest levels, an effort to achieve a new kind of connection with the universe—to regain an integration or connectedness that has been shattered by standing apart from the cosmos and examining it as something that is not alive, not intelligent, and separate from ourselves[7].

1AC – Search Adv 3/

This alone solves for connectivity, catastrophes, war, overpopulation, and environmental destruction

Tough, University of Toronto 98

(Allen, Positive consequences of SETI before detection, Acta Astronautica Volume 42, Issues 10-12, May-June 1998, Pages 745-748)

Photographs of the whole earth from the early space missions gave us a fresh perspective. A more recent photograph from even further away in our solar system gives us the sense of being a small fragile planet—a pale blue dot surrounded by space[9]. SETI provides a third fresh perspective by encouraging us to think about how extraterrestrials might perceive us. As we view ourselves through the “eyes” of distant extraterrestrials, this fresh perspective leads in turn to a fresh way of looking at our society’s values, goals, priorities and foibles. Three aspects of SETI stimulate this fresh perspective by encouraging us to put ourselves “in the shoes” of remote extraterrestrials. (a) In order to choose search strategies, scientists must first think through the likely characteristics of whoever is out there, and their likely behaviour toward all other civilizations—in particular toward us since they may somehow be aware of our existence or even have some information about us. (b) During the past few years, at astronautics and SETI meetings, some attention has focused on what we should do about sending a reply after we detect a signal. Such thinking inevitably requires attention to how “they” might react to various sorts of replies that we might send. (c) In general, the whole SETI enterprise stimulates a wide variety of people to begin thinking more seriously about who might be out there and how they might view our society. By thinking about how a remote civilization might view us, we gain a fresh perspective on our own civilization. Various specific implications may occur to us. We may wonder why our society places such emphasis on differences among people when, compared with any extraterrestrial species, we are all quite similar and should feel deeply connected. We may see more sharply the importance of such priorities as ensuring our long-term survival and flourishing, caring about future generations, accumulating significant knowledge, protecting that knowledge from potential catastrophes, developing a set of universal goals and laws that might apply throughout the galaxy, and reducing our worst foibles and errors (warfare, population growth, environmental degradation). Surely extraterrestrials would wonder why we have not shifted our attention, resources, and efforts towards these key priorities.

Federal funding for the Allen telescope array solves

Wagenhofer, Copy Editor at The Emersonian, 11

(Ross, “Exobiology Blues”, May 10, http://thecommonvoice.net/?p=458)

To let the ATA out of commission, even for a short while, would mean that we would be closing ourselves, as a species, from the best shot we have at reaching out in the dark and finding something outside of ourselves. Imagine the ramifications, the profound shift in how we would have think of our place in the universe, if we found evidence of intelligent life in another section of the cosmos.

As we continue to move forward with technology and science, the portion of federal funds dedicated to the advancement of science has begun to dwindle, all the while our military spending balloons and expands. Consider the fact that a single Apache attack helicopter costs $18 million, or that the cost of a single predator drone is $4.5 million. The 2010 United States Department of Defense budget was $663.8 billion. It is difficult to imagine that of that vast and arguably unnecessary pool of money, $2.5 million cannot be extracted to keep alive the most promising tool mankind has ever conceived at finding other life in the universe. We are now in an era where paranoia about our enemies means that every fighter jet, every battleship, every expensive tank needs to be built, but where our hope about our possible universal neighbors is so diminished that we can’t even keep 41 radio antennas operating.

Our best estimates seem to indicate that in our galaxy, we may not be alone as the only race of intelligent creatures. Perhaps out there another planet with its own budget problems is sending off a handful of radio signals into the darkness of the space with the hope that it might be heard by someone else in the vastness of the Milky Way galaxy. Wouldn’t it be a shame if we weren’t listening?

1AC - Space Debris Adv 1/

Space debris on the rise—risks space based communications, navigation and Earth observation

Marks, chief technology correspondent, 2009

(Paul, “Satellite collision 'more powerful than China's ASAT test',” New Scientist Magazine, February 13, NS)

Worryingly, the new debris will raise the collision risk for other Iridium satellites. That's because the 65 remaining satellites in the Iridium network move in circular orbits that cross each other at the Earth's poles. "The debris cloud that is forming will create a torus [doughnut] of high-density debris that Iridium satellites will now need to pass through," warns Richard Crowther of the British National Space Centre. In his 2003 study, Lewis estimated that the further collision risk to other Iridium satellites over the month following a collision rose by several orders of magnitude over the previously quoted chance of 1 in millions. "So whilst it's too early to say for sure, the risk to other Iridium satellites now looks like it's going to be significantly higher than the background risk, based on our earlier work," says Lewis. 'Unfortunate but inevitable' Observers expected a collision sooner or later, given the number of dead and defunct satellites beyond anyone's control in various orbits. Less than 10% of the 18,000 objects monitored in low- and high-Earth orbits are working satellites – the rest are dead craft, spent rocket stages and debris. "It was unfortunate but inevitable", says Crowther, the UK delegate on the Inter-Agency Space Debris Coordinating Committee, an umbrella group of 11 space agencies that presses satellite operators to deploy measures to mitigate debris creation. Such measures include ensuring end-of-life craft have the capacity to either be de-orbited – burned up in the atmosphere – or have fuel and guidance to reach a safe 'graveyard' orbit beyond the geostationary ring. Without such measures, debris remains in orbit for a long time. 'Critical infrastructure' "The concern now is the orbital lifetime of the Iridium and Cosmos 2251 debris. It will take many tens of years to decay," Crowther says. "Given we rely so much on space-based assets for communications, navigation and Earth observation as part of our critical national infrastructure, this is one of the weak links in the chain that needs more attention," Crowther adds. Lewis agrees: "I think now this has happened, it's much more likely that governments are going to take this issue seriously."

Space surveillance is a key part to the Air Force Space Command for detecting space junk

Air Force Space Command 9

**(“Media Advisory: AFSPC explores Allen Telescope Array for Space Surveillance,” 5-19,** <http://www.afspc.af.mil/news/story.asp?storyID=123150121>, 6-22-11,GJV)

An important and high visibility mission of the United States Air Force Space Command (AFSPC) is Space Surveillance. Knowing exactly where orbiting objects are located in space at any given instant is key to ensuring safe space operations. The significance of the mission has become even more acute with the recent collision of an Iridium Satellite and an inoperable Russian Cosmos Satellite, which destroyed both satellites and created two large fields of space debris. This debris will be a risk to other satellites for years to come as the debris fields expand and their orbits degrade toward Earth.

1AC - Space Debris Adv 2/

Air Force satellites are key to US hard power – provide missile warning, intelligence, and surveillance

Hughes Network Systems, leading provider of satellite broadband, 11

(world’s leading provider of satellite broadband for home and office, delivering innovative network technologies, managed services and solutions for enterprises and governments globally. HughesNet® is the #1 high-speed satellite Internet service in the marketplace, March 8, “Hughes Wins U.S. Air Force Satellite Study Contract,” Space Ref, http://www.spaceref.com/news/viewpr.html?pid=32952) KA

Solid leadership and the coordination of resources will enable the United States to retain its leadership in space, Secretary of the Air Force Michael B. Donley said Nov. 21 during the Air Force Association's Global War Symposium in Los Angeles. Strong government and collaboration among leaders also will be required, said Secretary Donley, who described Airmen as "the connective tissue" across the national security space enterprise. "Space is an interagency domain, and for decades, the United States, and Airmen in particular, have sought to be good stewards of (it)," he said. Secretary Donley spoke about the service's space mission and its plan to reinvigorate its nuclear enterprise during the keynote address at the two-day AFA gathering, the final event during Air Force Week, a celebration held at three cities annually the past two years. He provided an update on his proposal to establish the provisional Global Strike Command by the end of the year to provide singular focus on nuclear operations, and he briefly discussed a plan to launch a numbered air force under Air Force Space Command to focus on cyber operations. Speaking to an audience made up largely of officers from nearby Los Angeles Air Force Base, home to the Space and Missile Systems Center, Secretary Donley said the time is ripe to discuss how to better organize and manage the national security space enterprise. In the Department of Defense, the Air Force secretary is designated as the executive agent for space, though four under secretaries and assistant secretaries reporting to the secretary of defense also retain oversight. The secretary of defense and under secretary of defense are the ultimate decision makers in defense space matters, he said. "Moving forward, my sense is that we need to forge a new path," said Secretary Donley. "Space-based capabilities constitute joint, interagency and national interests. They are national assets. Our challenge is to find ways to streamline and strengthen interagency governance of the space enterprise." Air Force officials are taking a close look at the Department of Defense and interagency space management and organization to provide President-elect Obama's administration "with a clear sense of the issues facing us today and their underlying root causes to lay the foundation for a well-informed discussion of the issues," Secretary Donley said. Secretary Donley said the Air Force's aging air and space fleets must be modernized. "We need to ensure that we prudently field new systems to meet emerging requirements and replace hardware that is, in many cases, aging out," he said. "This is perhaps most dramatic for our space systems, for which no service life extension or depot upgrades are possible." The secretary also said the new administration will have aircraft acquisition decisions to make regarding F-22 Raptor, C-17 Globemaster III and KC-X tanker development. The nation's space-borne early warning systems are critical, he said. "They provide missile warning, while intelligence, surveillance and reconnaissance satellites permit us insight into strategic intent. (They) contribute directly, and immeasurably, to the nation's nuclear deterrence and to our awareness and understanding of global events," he said. The ability of Air Force specialists to collect weather and remote sensing data from space-based systems is also critical, he said. Information from space systems supports a broad range of national missions, from disaster relief and humanitarian operations "to targeting for precision strike," he said. Satellite communications allow Global Hawk, Predator and Reaper systems to be flown overseas by operators in the continental U.S. They also permit the command and control of nuclear forces, he said. Commercial companies and the public benefit as well from Air Force technology. Global transportation and ATMs depend on the precision and reliability of the Global Positioning Systems. "GPS and other space systems are now part of the engine of American industry and also the global economy," he said. "Commercial and national security reliance on these space-based capabilities is now pretty interdependent." About 10,000 Air Force space professionals ensure the viability and safety of Air Force on-orbit systems, tailoring space activities to the needs of national leaders and combatant commanders. More than 1,900 of them work in joint or interagency positions. Airmen operate more than 120 satellites for a broad range of sister service, joint and interagency partners, whose appetite for space-based capabilities continue to increase, said Secretary Donley. Funding for space systems has increased steadily since 2000 and now represents 11 percent of the Air Force budget. Secretary Donley said the national security space enterprise faces key challenges in that the space industry is changing, consensus about the country's space future "remains elusive" and leaders "have yet to realize a vision for space." Corporate consolidation is changing the dynamics of the space industrial base, he said, and new mission areas are emerging, including space protection and space situational awareness, the ability to find, track, identify and characterize space objects. "The number of objects in the earth's orbit is increasing," said Secretary Donley. "As a result, we need to enhance our capabilities to track these items and to assess their purpose and, and when necessary, their intent."

1AC - Space Debris Adv 3/

Loss of American dominance creates multiple scenarios for nuclear war.

Kagan, sr. associate@Carnegie Endowment for Peace, 7

(Robert, “End of Dreams; Return of History,” 17 July 2007, Policy Review, No. 144, p. <http://www.hoover.org/publications/policy-review/article/6136#n10>, Accessed: 20 June 2011, JT)

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. It is easy but also dangerous to underestimate the role the United States plays in providing a measure of stability in the world even as it also disrupts stability. For instance, the United States is the dominant naval power everywhere, such that other nations cannot compete with it even in their home waters. They either happily or grudgingly allow the United States Navy to be the guarantor of international waterways and trade routes, of international access to markets and raw materials such as oil. Even when the United States engages in a war, it is able to play its role as guardian of the waterways. In a more genuinely multipolar world, however, it would not. Nations would compete for naval dominance at least in their own regions and possibly beyond. Conflict between nations would involve struggles on the oceans as well as on land. Armed embargos, of the kind used in World War i and other major conflicts, would disrupt trade flows in a way that is now impossible. Such order as exists in the world rests not merely on the goodwill of peoples but on a foundation provided by American power. Even the European Union, that great geopolitical miracle, owes its founding to American power, for without it the European nations after World War ii would never have felt secure enough to reintegrate Germany. Most Europeans recoil at the thought, but even today Europe ’s stability depends on the guarantee, however distant and one hopes unnecessary, that the United States could step in to check any dangerous development on the continent. In a genuinely multipolar world, that would not be possible without renewing the danger of world war. People who believe greater equality among nations would be preferable to the present American predominance often succumb to a basic logical fallacy. They believe the order the world enjoys today exists independently of American power. They imagine that in a world where American power was diminished, the aspects of international order that they like would remain in place. But that ’s not the way it works. International order does not rest on ideas and institutions. It is shaped by configurations of power. The international order we know today reflects the distribution of power in the world since World War ii, and especially since the end of the Cold War. A different configuration of power, a multipolar world in which the poles were Russia, China, the United States, India, and Europe, would produce its own kind of order, with different rules and norms reflecting the interests of the powerful states that would have a hand in shaping it. Would that international order be an improvement? Perhaps for Beijing and Moscow it would. But it is doubtful that it would suit the tastes of enlightenment liberals in the United States and Europe. The current order, of course, is not only far from perfect but also offers no guarantee against major conflict among the world ’s great powers. Even under the umbrella of unipolarity, regional conflicts involving the large powers may erupt. War could erupt between China and Taiwan and draw in both the United States and Japan. War could erupt between Russia and Georgia, forcing the United States and its European allies to decide whether to intervene or suffer the consequences of a Russian victory. Conflict between India and Pakistan remains possible, as does conflict between Iran and Israel or other Middle Eastern states. These, too, could draw in other great powers, including the United States. Such conflicts may be unavoidable no matter what policies the United States pursues. But they are more likely to erupt if the United States weakens or withdraws from its positions of regional dominance. This is especially true in East Asia, where most nations agree that a reliable American power has a stabilizing and pacific effect on the region. That is certainly the view of most of China ’s neighbors. But even China, which seeks gradually to supplant the United States as the dominant power in the region, faces the dilemma that an American withdrawal could unleash an ambitious, independent, nationalist Japan. In Europe, too, the departure of the United States from the scene — even if it remained the world’s most powerful nation — could be destabilizing. It could tempt Russia to an even more overbearing and potentially forceful approach to unruly nations on its periphery.

Although some realist theorists seem to imagine that the disappearance of the Soviet Union put an end to the possibility of confrontation between Russia and the West, and therefore  to the need for a permanent American role in Europe, history suggests that conflicts in Europe involving Russia are possible even without Soviet communism. If the United States withdrew from Europe — if it adopted what some call a strategy of “offshore balancing” — this could in time increase the likelihood of conflict involving Russia and its near neighbors, which could in turn draw the United States back in under unfavorable circumstances. It is also optimistic to imagine that a retrenchment of the American

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1AC - Space Debris Adv 4/

\*\*\*Continued\*\*\*

position in the Middle East and the assumption of a more passive, “offshore” role would lead to greater stability there. The vital interest the United States has in access to oil and the role it plays in keeping access open to other nations in Europe and Asia make it unlikely that American leaders could or would stand back and hope for the best while the powers in the region battle it out. Nor would a more “even-handed” policy toward Israel, which some see as the magic key to unlocking peace, stability, and comity in the Middle East, obviate the need to come to Israel ’s aid if its security became threatened. That commitment, paired with the American commitment to protect strategic oil supplies for most of the world, practically ensures a heavy American military presence in the region, both on the seas and on the ground. The subtraction of American power from any region would not end conflict but would simply change the equation. In the Middle East, competition for influence among powers both inside and outside the region has raged for at least two centuries. The rise of Islamic fundamentalism doesn ’t change this. It only adds a new and more threatening dimension to the competition, which neither a sudden end to the conflict between Israel and the Palestinians nor an immediate American withdrawal from Iraq would change. The alternative to American predominance in the region is not balance and peace. It is further competition. The region and the states within it remain relatively weak. A diminution of American influence would not be followed by a diminution of other external influences. One could expect deeper involvement by both China and Russia, if only to secure their interests. [18](http://www.hoover.org/publications/policy-review/article/6136" \l "n18) And one could also expect the more powerful states of the region, particularly Iran, to expand and fill the vacuum. It is doubtful that any American administration would voluntarily take actions that could shift the balance of power in the Middle East further toward Russia, China, or Iran. The world hasn ’t changed that much. An American withdrawal from Iraq will not return things to “normal” or to a new kind of stability in the region. It will produce a new instability, one likely to draw the United States back in again. The alternative to American regional predominance in the Middle East and elsewhere is not a new regional stability. In an era of burgeoning nationalism, the future is likely to be one of intensified competition among nations and nationalist movements. Difficult as it may be to extend American predominance into the future, no one should imagine that a reduction of American power or a retraction of American influence and global involvement will provide an easier path.

Allen telescope array solves - key to tracking space debris

International Business Times 11

(“Search For Alien Intelligence On Hold,” Lexis, April 26, NS)

The SETI Institute hopes that the public will step in. Tarter noted there is a proposal to use the antennas to help the U.S. Air Force track and map space debris in orbit. The bits of flotsam and jetsam in low Earth orbit can be dangerous to satellites and to people working on the International Space Station. Even a tiny piece of metal or plastic is dangerous when travelling at thousands of kilometers per hour - faster than bullets - and tracking them would be a great benefit to satellite operators as well as a steady source of funds. The Allen telescopes have been part of several research projects that aren't directly related to listening for extraterrestrials. Among them are measuring the hydrogen content of galaxies, measuring the magnetic field of the Milky Way and detecting star formation. But all this enables the antennas to listen at certain frequencies for an artificial sign.

1AC – Int’ l Science Cooperation Adv. 1/

Federal funding SETI key to international, multidisciplinary scientific cooperation

Steel, professor of Physics at the University of Michigan, 95

(Duncan, “Tunguska and the Kagarlyk meteorite”, The Observatory, June, p.135, <http://adsabs.harvard.edu/full/1995Obs...115..136S>, NS).

The effect of Congress' withdrawal of funding for SETI not only puts US ETI signal detection in the private money sector, but also affects the funding of international cross-disciplinary conferences. The 1995 IAA Conference on SETI and Society, for instance, is shifted to second priority and postponed indefinitely. The conference, the first of its kind, would have focused on cultural aspects of the search for extraterrestrial intelligence and the implications for society of the discovery of signals from other civilisations in the Galaxy. Scheduled topics of the various sessions included: the history of ideas and concepts relating to inhabited worlds beyond Earth; the psychological, social, and cultural variables that could affect the way humankind could or would react to a received ETI signal; modes of reporting major ETI discoveries; institu­tional and political aspects of a SETI discovery; the legal status of extraterres­trial societies, and the implications of the discovery of other worlds in the Galaxy for human ideologies, including religion. Jean Heidmann, Chair of the now defunct Local Organizing Committee, points out that the highlighted programme touches the most profound aspects of humankind. Be that as it may, in the privatized world of SETI the partic­ipation of a wide circle of specialists, from historians and psychologists to philosophers and space lawyers, is prevented because of the lack of financial support.

Spills over to broader international scientific and political cooperation

Landsgård, Communications Department, Norwegian Embassy, 10

(Kristian Sept. 6 2010: The Roll of International Cooperation in Science”, <http://www.norway.org/News_and_events/Research--Technology/The-role-of-international-cooperation-in-science/>, 6.25.11) SW

The role of international cooperation in science Last updated: 9/10/2010 // On Monday, September 6, 2010, Norwegian Foreign Minister Jonas Gahr Støre addressed the community of researchers participating in the 2010 Kavli Prize Science Forum in Oslo. “Our room for manoeuvre as politicians is in large part shaped by the knowledge you, as scientists, produce,” Støre said. Held every two years in Oslo, the Kavli Prize Science Forum gathers researchers and scholars in Oslo, and features the awarding of three prizes, for outstanding research in the fields of astrophysics, nanoscience and neuroscience. The Kavli Prize is issued by the Kavli Foundation, which was founded in 2000 by Norwegian-born entrepreneur and philanthropist Fred Kavli, in partnership with The Norwegian Academy of Science and Letters and The Norwegian Ministry of Education and Research. Linking science with politics Støre emphasized the importance of research for politics. “In the last instance, political decisions are based on human considerations and human trade-offs. Our room for manoeuvre as politicians is in large part shaped by the knowledge you, as scientists, produce,” he said. Although the scientific community and the political system have distinct roles to play, Støre said that cooperation and better communication between the two spheres will be vital. Global issues The foreign minister also commented on the discrepancy between the global nature of many problems facing the international community, and the national policy tools at our disposal to solve them. For the last four centuries, the nation state has been the primary political unit – a logic that is challenged by increasingly global policy issues, such as climate change. This increases the demand for scientific knowledge. “As I see it, it has never been more timely for a Foreign Minister to devote interest, attention – and even at times passion – to science cooperation than it is today, given the character of many of the challenges we are facing. Because these challenges are complex: they are national and they are international at the same time; they are trans-national and global,” said Støre. Partnerships Støre also praised Mr. Fred Kavli for establishing the Kavli Foundation, which enables the best scientists from all over the world to carry out research and develop new stores of knowledge at various universities. According to Støre, such partnerships between governments, philanthropists and the scientific community are highly valuable. “While the governments of the world have the prime responsibility, we are also dependent on the involvement of the private sector. We all know how important large philanthropic donations to promote world class science and research have been, especially in countries like the one Fred Kavli moved to,” he said. ­

1AC – Int’ l Science Cooperation Adv. 2/

Warming is real and anthropogenic

Brown, founder Earth Policy Institute, 8

(Lester R., , Plan B 3.0: Mobilizing to Save Civilization, p. 49-50)

Since 1970, the earth’s average temperature has risen by 0.6 degrees Celsius, or 1 degree Fahrenheit. Meteorologists note that the 23 warmest years on record have come since 1980. And the seven warmest years since recordkeeping began in 1880 have come in the last nine years. Four of these—2002, 2003, 2005, and 2006—were years in which major food-producing regions saw their crops wither in the face of record temperatures.7 The amount of carbon dioxide (CO2) in the atmosphere has risen substantially since the start of the Industrial Revolution, growing from 277 parts per million (ppm) to 384 ppm in 2007. The annual rise in the atmospheric CO2 level, one of the world’s most predictable environmental trends, is the result of the annual discharge into the atmosphere of 7.5 billion tons of carbon from burning fossil fuels and 1.5 billion tons from deforestation. The current annual rise is nearly four times what it was in the 1950s, largely because of increased emissions from burning fossil fuels. As more CO2 accumulates in the atmosphere, temperatures go up.8

**Global Warming causes extinction**

**Stein** **editor for The Guardian 06**

**(**David, Science, 2006, “Global Warming Xtra: Scientists warn about Antarctic melting,” http://www.agoracosmopolitan.com/home/Frontpage/2008/07/14/02463.html)

Global Warming continues to be approached by governments as a "luxury" item, rather than a matter of basic human survival. Humanity is being taken to its destruction by a greed-driven elite. These elites, which include 'Big Oil' and other related interests, are intoxicated by "the high" of pursuing ego-driven power, in a comparable manner to drug addicts who pursue an elusive "high", irrespective of the threat of pursuing that "high" poses to their own basic survival, and the security of others. Global Warming and the pre-emptive war against Iraq are part of the same self-destructive prism of a political-military-industrial complex, which is on a path of mass planetary destruction, backed by techniques of mass-deception."The scientific debate about human induced global warming is over but policy makers - let alone the happily shopping general public - still seem to not understand the scope of the impending tragedy. Global warming isn't just warmer temperatures, heat waves, melting ice and threatened polar bears. Scientific understanding increasingly points to runaway global warming leading to human extinction", reported Bill Henderson in CrossCurrents. If strict global environmental security measures are not immediately put in place to keep further emissions of greenhouse gases out of the atmosphere we are looking at the death of billions, the end of civilization as we know it and in all probability the end of humankind's several million year old existence, along with the extinction of most flora and fauna beloved to man in the world we share.

Only successful international cooperation can solve

Winchester, Director of the Center for the Study of Global Change, Indiana University—Bloomington, 9

N.Brian, Project Muse, “Emerging Global Governance”, Feb 2009, <http://muse.jhu.edu/journals/indiana_journal_of_global_legal_studies/v016/16.1.winchester.html>, 6.23.11, SW)

While environmental values have steadily gained widespread, even global, acceptance, they are often in conflict with economic interests and international politics. Environmentalism is further challenged by scientific uncertainty involving effects that will in some cases only become manifest far into the future. Nonetheless, accompanying this global environmental awakening has been an extraordinary number of international environmental agreements. It is these international regimes, involving a variety of non-state actors, which suggest movement toward an evolving, complex form of global environmental governance. "One idea now gaining political currency is to upgrade the U.N. Environment Programme into a World Environment Organization (WEO) on a par with the WTO,"61 but what is clear is that this is no longer a matter simply for states or intergovernmental organizations. Private firms, NGOs, subunits of governments, and the transitional and transgovernmental networks that result all play a role.62 Whatever the eventual global political dispensation, there is likely to be wider participation and more transparency and accountability, and that should please democrats everywhere. To forge a more coherent global environmental management policy, governments must be persuaded that their national self-interest is inextricably tied to the global common good and to act accordingly.

\*\*\*Inherency\*\*\*

Inherency

Budgetary constraints force SETI to shut down 42 telescopes

CBS News 4-26-11

(CBS News: “Alien-seeking radio dishes go dark”, http://www.cbsnews.com/stories/2011/04/26/scitech/main20057492.shtml, Lexis 4-26-2011 MLF 6-24-11)

Any number of headlines about E.T. not being able to phone home are already hitting the wires, but the hackneyed reference to everyone's favorite pop culture alien figure underscores a more troubling reality: the decades-long search for extraterrestrial life suffered a blow with the announcement that a $50 million alien telescope array is being mothballed because of a lack of funding. SETI, an acronym for the Search for ExtraTerrestrial Intelligence, refers to a project that's been underway to answer the not-so-inconsiderable question of whether humans are truly alone in the universe. The original plans called for the Allen Telescope Array, part of the Hat Creek Radio Observatory, to house as many as 350 dishes. However, budgetary constraints have forced the SETI Institute to shut the first 42 telescopes which were installed in 2007 to scan the skies for evidence of alien life. It's not clear when - or whether - the telescopes will return to operations. SETI received the bulk of its funding from a couple of sources: the National Science Foundation, and the State of California. SETI's large-scale telescope scans the skies"Unfortunately, today's government budgetary environment is very difficult, and new solutions must be found," Tom Pierson, CEO of the SETI Institute, wrote in a note posted on SETI's website. Pierson was alluding to recent budgetary constraints both on the federal and state levels forced by the recent recession. As a result of tighter times, the arrays were put into so-called hibernation mode" on April 15 as the organization now finds itself scrambling to locate other sources of funding. (Microsoft co-founder Paul Allen initially provided $25 million for the ATA.) "Hibernation means that, starting this week, the equipment is unavailable for normal observations and is being maintained in a safe state by a significantly reduced staff," according to Pierson. The satellite array, which is located about 300 miles north-east of San Francisco, is a partnership between the SETI Institute and the Radio Astronomy Lab of the University of California, Berkeley. They were considered to be among the fastest radio telescopes in the world and were focused on signals in the 1,000 MHz to 3,000 MHz range.

No more search for ET’s – SETI funding gone

AFP 4-26-11

(Agent France Presse 24 Hour News Service: “US budget cuts mean no more ET monitoring”, http://www.google.com/hostednews/afp/article/ALeqM5gvL4nw5xCJ8iVKzzWt3KqNhNZIwg?docId=CNG.63fb2ad519b09157eceef520a8d8dc97.f1, 4-26-2011 Lexis MLF 6-24-11)

A monitoring system for potential extraterrestrial communication has been shelved due to budget cuts, one of its partners said Tuesday. With funding dried up, the SETI (Search for Extraterrestrial Intelligence) established in 1984, had to put the Allen Telescope Array (ATA) on an indefinite pause, the institute said in a letter. The telescopes, at the Hat Creek Radio Observatory north of San Francisco, California, had been monitoring for potential messages beyond our planet. "Effective this week, the ATA has been placed in hibernation due to funding shortfalls for operations of the Hat Creek Radio Observatory where the ATA is located," said a letter from Tom Pierson, CEO of SETI Institute. Funding for HCRO had been cut to one tenth its former level, he said, noting that partners were being sought.

Inherency

SETI can’t operate now- lacks funding.

The Associated Press 5-1-11

(The Associated Press News Organization: Shrinking funds pull plug on alien search devices ; Instead of searching for life, astronomers are searching for funding” 5-1-11 Lexis MLF 6-21-11)

In the mountains of Northern California, a field of radio dishes that look like giant dinner plates waited for years for the first call from intelligent life among the stars. But they're not listening anymore. Cash-strapped governments, it seems, can no longer pay the interstellar phone bill. Astronomers at the SETI Institute said a steep drop in state and federal funds has forced the shutdown of the Allen Telescope Array, a powerful tool in the search for extraterrestrial intelligence, an effort scientists refer to as SETI. "There's plenty of cosmic real estate that looks promising," Seth Shostak, senior astronomer at the institute, said Tuesday. "We've lost the instrument that's best for zeroing in on these better targets." The shutdown came just as researchers were preparing to point the radio dishes at a batch of new planets. About 50 or 60 of those planets appear to be about the right distance from stars to have temperatures that could make them habitable, Shostak said. The 42 radio dishes had scanned deep space since 2007 for signals from alien civilizations while also conducting research into the structure and origin of the universe. SETI Institute chief executive Tom Pierson said in an email to donors recently that the University of California, Berkeley, has run out of money for day-to-day operation of the dishes. "Unfortunately, today's government budgetary environment is very difficult, and new solutions must be found," Pierson wrote. The $50 million array was built by SETI and UC Berkeley with the help of a $30 million donation from Microsoft Corp. co-founder Paul Allen. Operating the dishes cost about $1.5 million a year, mostly to pay for the staff of eight to 10 researchers and technicians to operate the facility. An additional $1 million a year was needed to collect and sift the data from the dishes. The Paul G. Allen Family Foundation, the billionaire's philanthropic venture, had no immediate plans to provide more funding to the facility, said David Postman, a foundation spokesman. The institute, however, was hopeful the U.S. Air Force might find the dishes useful as part of its mission to track space debris and provide funding to keep the equipment operating. The SETI Institute was founded in 1984 and has received funding from NASA, the National Science Foundation and several other federal programs and private foundations. Other projects that will continue include the development of software and tools to be used in the search for extraterrestrial life.

\*\*\*Search Adv\*\*\*

Contact – Now Key Time

Only SETI will be able to make contact with ET—Frank Drake, founder of seti, agrees

Sato, Editor Daily Galaxy, 9

(Rebecca, April 3, The Daily Galaxy, [SETI Chief Astronomer: "Humans Predicted to Make Contact with an Extraterrestrial Civilization Within Two Decades"--A Galaxy Classic](http://www.dailygalaxy.com/my_weblog/2009/04/humans-predicte.html), <http://www.dailygalaxy.com/my_weblog/2009/04/humans-predicte.html>) PG

This will allow SETI to home in on where the odds of life are possibly greatest. Currently, SETI’s mission to find life on other planets is like trying to find the proverbial needle in a haystack. But now, whenever Kepler identifies planets most likely to sustain life, the team at SETI will be able to focus in on those solar systems using deep-space listening equipment. This will be a huge upgrade from their present work of randomly scanning the outer reaches of space for some kind of sign or signal. Also, upping the ante, is the recent discovery of Earth-like planets outside our solar system, which has led astrophysicists to conclude that Earth-like planets are likely relatively common in our galaxy. "Everything has caused us to become more optimistic," said American astrophysicist Dr Frank Drake in a recent BBC documentary. "We really believe that in the next 20 years or so, we are going to learn a great deal more about life beyond Earth and very likely we will have detected that life and perhaps even intelligent life elsewhere in the galaxy."

Allen telescope array means contact likely before 2025

McKie, Science Editor, 10

(Robin, February 7, p6, The Guardian, “First contact: will we ever hear from aliens?”, http://www.guardian.co.uk/culture/2010/feb/07/extraterrestrial-life-robin-mckie)

However, **Seti scientists are now building their own telescopes, a classic example being the Allen Array, funded through a $11.5m donation from Paul Allen**, co-founder - with Bill Gates - of Microsoft. To date, **42 radio telescopes, each with a six-metre diameter, have been erected** at a site north-east of San Francisco. When the project is complete, a total **of 350 dishes will transform earthlings' hunt for aliens. "When we do get a signal - and I am betting it will happen before 2025** - we will follow its source very carefully across the sky, as the Earth rotates," says Shostak. "Then we will ask other observatories to check it out, and if they back us we will simply announce the existence of a message from ET. There will be no message to the president and no interference from Men in Black.

We will make contact within the century – must begin to prepare now

Surette, staff writer Ottawa Citizen, 99

(Louise, The Ottawa Citizen, August 12, Lexis, “Professor predicts first contact with aliens some time next century: It's time to prepare for impact on society, Toronto academic warns”) PG

TORONTO -- **Making contact with intelligent life in outer space will likely occur sometime during the next century, says a Toronto-based scholar in an article featured in a recently published American book of essays** surrounding the next millennium. Few events in the sweep of human history will be as significant and as far-reaching as contact with intelligent life in outer space, and **now is the time for us to begin to prepare for the social and physiological impact, says Allen Tough,** a retired education professor from the University of Toronto and an expert in future studies**.**

Contact Good – Solves EVERYTHING

Contact solves the environment, health, colonization, and potentially all social or psychological problems

Tough, Professor Emeritus at the Ontario Institute for Studies in Education, University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 15, 21 July 2011) SW

Tough’s respondents hoped that through communicating with advanced extraterrestrial societies we will gain practical information that will help us solve contemporary problems, improve the quality of human life, and secure our own future as a species. We imagine ETI as having made technological advances that we seek in our own future: increasingly miniaturized and powerful information processing devices; cheap and inexhaustible sources of power; gentle chemical procedures that replace the surgeon’s scalpel; workable means for interstellar travel; pro-longed life; and cyborgs endowed with near-immortality. Perhaps we will be coached in faster-than-light communication, interstellar travel, and other technologies that appear at the cusp between science and science fiction. If contact leads to the transfer of technology, and if we understand how to use this technology and are able to cope with the full range of environmental, social, and psychological consequences, we may become empowered to solve some of our biggest problems, improve the quality of human life, and accelerate our own evolution. Interaction with many ETI societies would expose us to unprecedented levels of diversity and stimulation. Over time, knowledge gained from an extraterrestrial civilization could shape human leisure-time or recreational activities. For example, at some point people may embrace extraterrestrial costumes, dances, foodstuff, and customs. At first, these might be mimicked at “trendy” social events. Theme parks or museums could convey a sense of what it might be like to live within ETI society. Amusement park rides could be based on ETI conveyances (even as imagined spaceships shape many amusement park rides today). And, if interstellar travel proves to be much less daunting than it appears right now, then it is conceivable that in a thousand years extraterrestrial societies could become desirable tourist destinations. Already, there are energetic efforts to develop space tourism, including suborbital and orbital flights, space hotels, and luxury cruises around the moon.

Contact Good – Solves Laundry List

Contact solves a laundry list of impacts

Tough, Professor Emeritus at the Ontario Institute for Studies in Education, University of Toronto, 91

(Allen, Prof. OISE, founded Invit. to ETI, Journal of British Interplanetary Society, Vol. 39, pp 492, “What Role will extraterrestrials play in humanity’s future?”) PG

**Probable capacities in one civilisation or another include the following: • virtually unlimited energy (solar, nuclear, etc.) • technology and know- how that are so advanced that they would appear to us as miraculous • enormously evolved individual brainpower linked with an implanted twentieth-generation computer • the capacity to live and travel anywhere in space, probably approaching and perhaps surpassing the speed of light • elimination of individual and collective behaviour thai is violent, destructive, or harmful • loving cooperation, altruism, and compassion com­bined with sensible public decision-making • individual self-understanding, self-acceptance, and mental health that are very high, along with the skill of relating effectively and harmoniously with members of one's own species excellent skill (at least among the members of specially trained intcrcultural teams) at interacting with vastly different species and cultures • knowledge and wisdom unimaginable to us • excellent control over biological reproduction and evolution, including very healthy long-lived bodies and super-capacity brains • the technological and/or psychic ability to send information, receive information, detect, and observe across vast distances at the speed of light or even faster • the technological/psychic ability to covertly influ­ence an individual's thoughts, images, motives, and experiences • the technological/psychic ability to influence virtu­ally any object, and to transfer one's body or con­sciousness instantly from one place to another " organic or psychic connections to other members of the species, or to a central organism or brain • extremely rapid, accurate, versatile, and powerful weapons.**

**Such a list may strike us as unbelievable when we first read it. Would a human being 10.000 years ago. though, have reacted any differently to a list of our present capacities?** Airplanes, astronauts, Moon-walks, telescopes, selective breeding, television, electricity, microbes, hospitals, DN A. com­puters, universities, skyscrapers, cordless telephones, nuclear weapons, the United Nations, taxes, and many other aspects of today's world would have been dismissed 10,000 yean ago as ridiculous or impossible. That was the time when the Ice Age ended, humanity's main crops became domesticated, and the world's first town arose. Pigs, cattle, and horses had not yet been tamed 10,000 yean ago. Weaving, wagon wheels, and writing had not yet been invented. The Bronze Age and Iron Age had not yet begun. Stone buildings, philosophy, and science still lay in the future (l**). No wonder the people of 10,000 years ago could not have anticipated today's capacities. For us, in turn, the actual capacities of a civilisation 10,000 or a million years beyond us will probably make my list seem unimaginative.** Will surveillance, communication, or travel ever be faster than the speed of light? As our understanding of the laws of physics is expanded, we may discover physical principles far beyond what we now imagine. James Trctil has declared. "It is presumptuous of us to suppose, on the basis of three hundred yean of experience with science, that barriers that appear insurmountable to us will remain insurmountable 30 million yean from now" (2). Peter Sturrock, too, has said. '"The laws of gravitation and motion have been known for only about 300 years, electromagnet ism for about 100 years, arid quantum theory and relativity for only about 50 yean. **Why should we believe that, if scientists were to continue working for another million years, there would not be comparable revolutions or revelations?"** (3).

Contact Good – Access to the Galactic Club

Access to the Galactic Club will give us aggregated resources and peace

Harrison, PhD Professor at UC Davis and Dick Served as Chief Historian at NASA, 2000

(Albert is a PhD Professor of Psychology at UC Davis and Steven Served as Chief Historian at NASA When SETI Succeeds: The Impact of High-Information Contact “Contact: Long-Term Implications for Humanity” p. 18 http://ieti.org/tough/books/succeeds/sectII.pdf MLF 6-22-11)

In his seminal work Living Systems, James Grier Miller points out a trend towards increasingly larger systems (Miller, 1978). In human history we see a shift from small communities to cities and nations, and now interstate political systems. Thus, some European city-states and principalities ﬁrst joined together into nations recently have become part of the European Union. This tendency to form increasingly large sociopolitical units is noted in discussions of world government (Schenkel, 1999) and of the Galactic Club (Bracewell 1975). The potential advantages of joining together include aggregated resources and peace.

Contact Good – Culture/Society

Regardless of results, SETI helps us come to grips with our existence

Chandler, science writer, 1984

(David L., “ASTRONOMY; LISTENING TO THE STARS GETS RESPECT,” Boston Globe, p. 1, June 25, NS)

But for the most part, the scientists gathered here were not interested in such practical spinoffs from their work. "I wouldn't want to justify it on those grounds," Morrison said. The justification the SETI scientists prefer seems to be more philosophical than practical. Michael Papagiannis, BU astronomy professor, president of the IAU's SETI commission and organizer of the symposium, summed it up thus: "We stand at a historic threshold. We have the chance to open the windows of our tiny planet. We can now seek experimentally the answers to ancient and fundamental questions." Morrison adds that one of the benefits of SETI research is that it causes us to take a "broad look at our own history." Sagan says that "provided we play the game, we win whether we find extraterrestrial intelligence or not. Suppose we do a comprehensive search and find nothing. Is this a failure? I don't think so." Whether we find signals or not, he says, it will teach us valuable lessons about our place in the universe.

Contact Good – Solves Racism

Contact solves racism

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 16, 21 July 2011) SW

Many other factors—such as our progress in spacefaring— will contribute to our consciousness of the cosmos. Second, knowledge of relationships among extraterrestrial subpopulations could help us gain insight into intergroup relations on Earth. We may learn, for example, from how ETI societies treat different societies as well as their own subpopulations. This discovery could cause us to reflect on how we ourselves treat people from different cultures and subcultures. By seeing how ETI manages diversity, we may learn new models for group relations on Earth. Almost a century of work in psychology and sociology shows that other people’s treatment of us shapes our views of ourselves. People who are treated as competent and worthwhile individuals tend to develop high self-confidence and perform well. Selfconfidence and success tend to feed upon each other and generate an upward spiral of events. People who are treated as inferior and incompetent lose self-confidence and motivation, and perform poorly. Low self-confidence and poor performance also feed on each other, in this case creating a downward spiral.

Extraterrestrial research and especially language perception opens our relationship with the other and eliminates racial binaries

Collins, Ph.D. chair and department of sociology and anthropology, 2007

(Samuel Gerald, “Le Temps Perdu: Anthropologists (Re)discover the Future,” Anthropology Quarterly,80:4, p. 1175 Fall, NS)

Christopher Roth=professor of anthropology and ethnohistory at the University of Wisconsin

E.T.s connect all sorts of anomalous agents in uncanny assemblages that promise to re-shape both the lives of people and the discourses of knowledge and science, supporting "our creative leaps into hypothesis-into the gaps of comprehension that are requisite for imagining new forms of relationality and new ways of knowing-and thus of agency and empowerment" (12). Of course, it's worth asking whether the diverse agencies interconnected in the "E.T. Effect" have equal stakes in the uncanny. Can we compare the terror of the abductee with the thrill of the anthropologist engaging in the discursive frisson? As we will see later, this will haunt this nascent E.T. Anthropology-examining E.T.s too closely opens anthropology onto (other) abductions. Christopher Roth's contribution, "Ufology as Anthropology," squarely locates the alien in the interstices of religion and science, on the one hand, and anthropology and race, on the other. That is, looking at the transformations of the alien in years following the 1947 Roswell incident, Roth finds in them familiar strains of polygenism, social Darwinism, and anti-Semitism, as well as the ghost of anthropology's last polygenist, Carleton S. Coon (whose contribution to the 1968 collection Apeman, Spaceman comes back to haunt this volume as well). The early narratives of the alien in the 1950s were recapitulations of theosophy-aliens coupling with our hominid forbears created Homo sapiens and only by finding the "purer" strain of alien blood can we hope to realize this extraterrestrial patrimony. However: the "modern" alien-those Greys proliferating through media-suggests a departure from 19th century. Starting

with the 1961 abduction narratives of the mixed-race couple, Betty and Barney Hill, the alien becomes less familiar (although Roth looks to Wells), and, shorn of much of the "master race" discourse, more inscrutable. In this, though, Roth sees the possibilities for an E.T. that undermines U.S. racial binarisms: "Like the 1960s themselves, the Hill abduction was terrifying, but with a note of optimism" (61). that is, the alien brings with it the possibility of transformation. David Samuels's perceptive essay on alien language likewise turns on the optimistic transduction of the alien and the human. Beginning with the 19th century "Martian" of Mlle Helene Smith (which turns out to be a relexification of French), Samuels suggest that the imagined, alien language (and the hope for communicating with extraterrestrials) conjures up a discourse flitting between the "alien" and the "human," in which, like Freud's uncanny, one morphs into the other. That is, "alien" tongues must be different, but must also be familiar. This is, after all, the idea behind SETI-however different alien physiognomies may prove, they must still be monitoring (and sending) radio signals at the frequency of the spectral emission of neutral hydrogen (1420 MHz). Again we see the dance between clarity and opacity, the desire to be human and alien simultaneously. The dance is similar to another, which is the dance between universality and particularism, like the internal structures of languages in the relationships between languages and minds, cultures and experiences of their speakers. The bandleaders for this dance could be called Chomskyanism and Whorfianism (124). Like the television program X-Files (and conspiracies in general) the alien begins on the peripheries of knowledge but is gradually revealed as central to power itself: this dalliance with the alien is revealed at the core of anthropological theory. How many other anthropologies have relied on the elenchus of the alien?

Impact Calculus – Contact Outweighs

Contact outweighs everything

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 7, 21 July 2011) SW

In recent years, scientists and the general public have realized that intelligent life may well be found throughout the universe. It is extremely unlikely that we are the only civilization in our galaxy. It may even contain dozens or hundreds of civilizations scattered among its 400,000,000,000 stars. If we receive a richly detailed message from one of these civilizations or engage in a lively dialogue, the effects on our civilization could be pervasive and profound. Contact with intelligent life from somewhere else in our galaxy will probably occur sometime in humanity’s future. It might take the form of a richly detailed radio or laser message from the distant civilization, for instance, or a super-intelligent probe that reaches our planet. Such contact might occur next year, or 20 or 30 years from now, or not for 100 years, or even longer. Few events in the entire sweep of human history would be as significant and far-reaching, affecting our deepest beliefs about the nature of the universe, our place in it, and what lies ahead for human civilization. Seeking contact and preparing for successful interaction should be two of the top priorities on our civilization’s current agenda. Such contact will surely be an extraordinary event in all of human history. Over the next thousand years, several significant events will, no doubt, have a powerful, positive impact on human society. But making contact with another civilization will likely be the event with the highest positive impact of all. A few hundred scientists, social scientists, artists, engineers, and technicians around the world are currently involved in the search for such contact—the search for extraterrestrial intelligence (SETI). This volume, When SETI Succeeds , examines the potential impact on human culture, science, philosophy, and society. Any other civilizations in our galaxy are probably much older than human civilization. Two factors support this assumption. First, the vast majority of stars in our galaxy are much older than our Sun, many of them millions of years older. It follows, then, that any civilizations on planets revolving around those stars likely arose much earlier than our own civilization did. Second, it seems quite possible that some civilizations survive for a million years or even longer. If the civilizations in our galaxy range in age from a few thousand years up to a million years, then we are one of the youngest: by most definitions, human civilization is not much more than 10,000 years old.

AT: ETI won’t Communicate

ETI may have multiple motivations for communication

Benford, astrophysicist and in the department of Physics and Astronomy at UC Irvine, Benford, expert in high powered microwaves, 2011

(Gregory, James, “Smart SETI,” Analog Science Fiction & Fact, 131:4, p.33, April, NS)

What could motivate a Beacon builder? Here we can only reason from our own historical experience. Other possible high intelligences on Earth (whales, dolphins, chimpanzees) do not have significant tool use, so they do not build lasting monuments. Sending messages over millennia or more connects with our own cultures. Human history suggests (Benford G., 1999) that there are two major categories of long-term messages that finite, mortal beings send across vast time scales: • Kilroy Was Here: These can be signatures verging on graffiti. Names chiseled into walls have survived from ancient times. More recently, we sent compact disks on interplanetary probes, often bearing people’s names and short messages that can endure for millennia. • High Church These are designed for durability, to convey the culture’s highest achievements. The essential message is this was the best we did; remember it. A society that is stable over thousands of years may invest resources in either of these paths. The human prospect has advanced enormously in only a few centuries; the lifespan in the advanced societies has risen by 50% in each of the last two centuries. Living longer, we contemplate longer legacies. Time capsules and ever-proliferating 5 monuments testify to our urge to leave behind tributes or works in concrete ways (sometimes literally). The urge to propagate culture quite probably will be a universal aspect of intelligent, technological, mortal species (Minsky, 1985). Thinking broadly, high-power transmitters might be built for wide variety of goals other than two-way communication driven by curiosity. For example: • The Funeral Pyre: A civilization near the end of its life announces its existence. • Ozymandias: Here the motivation is sheer pride; the Beacon announces the existence of a high civilization, even though it may be extinct, and the Beacon tended by robots. This recalls the classic Percy Bysshe Shelly lines, And on the pedestal these words appear: 'My name is Ozymandias, King of Kings; Look on my works, Ye Mighty, and despair!’ Nothing beside remains. Round the decay of that colossal wreck, boundless and bare, The lone and level sands stretch far away. • Help! Quite possibly societies that plan over time scales ~1000 years will foresee physical problems and wish to discover if others have surmounted them. An example is a civilization whose star is warming (as ours is), which may wish to move their planet outward with gravitational tugs. Many others are possible. • Leakage Radiation: These are unintentional, much like objects left accidentally in ancient sites and uncovered long after. They do carry messages, even if inadvertent: technological fingerprints. These can be not merely radio and television broadcasts radiating isotropically, which are fairly

weak, but deep space radar and beaming of energy over solar system distances. This includes “industrial” spaceship launchers, beam-driven sails, “planetary defense” radars scanning for killer asteroids, and cosmic power beaming driving interstellar starships with beams of lasers, millimeter or microwaves. There are many ideas about such uses already in the literature (Benford & Benford, 2006). • Join Us: Religion may be a galactic commonplace; after all, it is here. Seeking converts is common, too, and electromagnetic preaching fits a frequent meme.

AT: Can’t Communicate – Uncivilized

Aliens are far more advanced than us- universe aging proves

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 3, 21 July 2011) SW

In recent years, scientists and the general public have realized that intelligent life may well be found throughout the universe. It is extremely unlikely that we are the only civilization in our galaxy. It may even contain dozens or hundreds of civilizations scattered among its 400,000,000,000 stars. If we receive a richly detailed message from one of these civilizations or engage in a lively dialogue, the effects on our civilization could be pervasive and profound. Contact with intelligent life from somewhere else in our galaxy will probably occur sometime in humanity’s future. It might take the form of a richly detailed radio or laser message from the distant civilization, for instance, or a super-intelligent probe that reaches our planet. Such contact might occur next year, or 20 or 30 years from now, or not for 100 years, or even longer. Few events in the entire sweep of human history would be as significant and far-reaching, affecting our deepest beliefs about the nature of the universe, our place in it, and what lies ahead for human civilization. Seeking contact and preparing for successful interaction should be two of the top priorities on our civilization’s current agenda. Such contact will surely be an extraordinary event in all of human history. Over the next thousand years, several significant events will, no doubt, have a powerful, positive impact on human society. But making contact with another civilization will likely be the event with the highest positive impact of all. A few hundred scientists, social scientists, artists, engineers, and technicians around the world are currently involved in the search for such contact—the search for extraterrestrial intelligence (SETI). This volume, When SETI Succeeds , examines the potential impact on human culture, science, philosophy, and society. Any other civilizations in our galaxy are probably much older than human civilization. Two factors support this assumption. First, the vast majority of stars in our galaxy are much older than our Sun, many of them millions of years older. It follows, then, that any civilizations on planets revolving around those stars likely arose much earlier than our own civilization did. Second, it seems quite possible that some civilizations survive for a million years or even longer. If the civilizations in our galaxy range in age from a few thousand years up to a million years, then we are one of the youngest: by most definitions, human civilization is not much more than 10,000 years old. Because other civilizations in our galaxy are thousands of years older than human civilization, they have probably advanced in certain ways beyond our present level of development. Some civilizations presumably fail to survive once they discover nuclear weapons or other means of causing their own extinction, but surely others learn to cope successfully with such problems and then survive for a very long time. Some of them may be 100,000 years or even millions of years more advanced than we are.

Exponential tech growth proves an advanced civilization

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf p. 3, 21 July 2011) SW

Perhaps the most common expectation is that ET civilizations will be technologically advanced (White, 1990). Given present search procedures, we are unlikely to encounter a civilization that is below our current technological level, since such a civilization is unlikely to use powerful radios, engage in space travel, or undertake other activities that we can detect. It seems statistically unlikely that we would encounter a civilization that is exactly at our level of technological maturity; hence, we expect to encounter civilizations that, compared to us, are technologically advanced. Astronomer Ray Norris (1998) calculates that the average civilization may be two billion years older than our own. Human experience suggests that technological advances accelerate over time; we have seen more technological advances during the last one hundred years than in the preceding two million years.

AT: Can’t Communicate – Math Solves

E.T. contact would most likely be through a form of mathematics

Highfield, Editor of New Scientist, 5

(Roger, October 5, The Daily Telegraph, “’The greatest discovery of all time’ The chances are there’s life out there, but any message could be thousands of years old and indecipherable. Roger Highfield reports, Lexis) KA

One problem is that it is doubtful a response can be drafted in advance. The nature and wording would depend on the possible meaning of the incoming message. "It could be an e-mail between stars that was never intended for us," said Prof Davies. Indeed, there is much debate about whether an alien culture with different histories and physical forms will have the same description of reality at all. Perhaps ET could invent radio technology without ever developing the concept of an atom. But it does seem likely she would use mathematics to advertise her intelligence, given that it is a universal language. This much was recognised long ago. In the early 19th century, the mathematician Karl Friedrich Gauss suggested etching giant geometric figures in the snow of Siberia as a way of attracting the attention of Martians.

AT: Can’t Communicate – Decoding Issues

Their technology solves decoding issues

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf p. 5, 21 July 2011) SW

If SETI succeeds, two types of contact are possible. One possibility is simply evidence that another advanced intelligence exists somewhere in the universe, with little information about its characteristics and no dialogue. One example is evidence of a Dyson sphere or some other major astroengineering project many light-years away, with no additional information about its creators. Another example is a radio message that arrives from many light-years away but is not successfully decoded even after many years of effort. The second possibility is contact that yields a rich storehouse of knowledge about the extraterrestrial intelligence and its history, technology, science, values, social organization, and so on. This could occur through an encyclopedic radio or optical message that we manage to decode. Because of recent progress in nanotechnology, artificial intelligence, and space exploration, we now realize that closeup contact with a small but super-smart probe is at least as likely a scenario. In fact, by monitoring our telecommunications, the probe will likely have learned our languages and be able to communicate with us quite effectively: no decoding necessary!

ETI Exist

Aliens exist—recent experiments prove

Romano, Senior Writer and Guterl, Senior Editor at Newsweek, 9

(Andrew and Fred, 8/24, Newsweek, Volume 154, Issue 8/9, EBSCO, “Aliens exist”) PG

But even if E.T. exists off the silver screen, the chances that he'll discover us any time soon are vanishingly slim (Reese's Pieces or not). After all, projects like SETI (Search for Extraterrestrial Intelligence) have been waiting since 1960 for aliens to make contact--without hearing the slightest peep. The good news, however, is that some scientists are finally focusing on the other side of the equation: a series of high-tech missions designed to help us find them. And even at this early stage, the circumstantial evidence they've gathered has made it clear that **we're probably not alone in the universe**. Here's what we know. In 1995, Swiss **astronomers pinpointed the first-extrasolar planet**. Unfortunately, it was a -giant ball of gas orbiting so close to its sun that it glowed with enough heat and radiation to vaporize even the hardiest little green men. But at least **the discovery proved that planets occurred outside our own cozy solar system. A few years later, "super-Earths" started to reveal themselves--smaller, firmer, at a discrete distance from their companion stars.** Although these planets are much larger and less temperate than ours, they prompted some astronomers to estimate that perhaps half of the 200 billion or so suns in the Milky Way support terrestrial, Earth-like worlds. We've also discovered that **water, the essential ingredient for life, exists elsewhere in the universe**--starting with our own solar backyard. Robots have spotted gullies freshly carved in the sides of Martian hills--evidence of recent upwellings. In June, **astronomers observed geysers of water vapor** on Enceladus, one of Saturn's moons. Even ghastly Jupiter is a candidate--or at least its moons Ganymede, Callisto, and Europa, the last of which may have oceans larger than ours hidden beneath its crust of perpetual ice. The question now is how many of those 100 billion potential Earths can we reasonably expect to have harbored H2O and served as a cradle of life, intelligent or not? Enter Kepler, an ambitious new NASA mission. Launched via satellite in **March, Kepler's $600 million space telescope uses a sophisticated photometer to stare at all 100,000 stars located in a particularly promising region of the Milky Way while measuring the size and orbit of every planet that passes in front of them**. The larger the shadow, the larger the planet; the more often it appears, the closer the orbit. **The point is to isolate for the very first time alien worlds orbiting alien suns at distances where temperatures are right for liquid water and possible life**. "This mission is like Columbus," says principal investigator Bill Borucki. "We will get Earth-sized planets, terrestrial planets, in the habitable zone. It won't be 'close.' We will know. The concept behind Kepler isn't new. Borucki--the sort of guy who skipped high-school projects to build elaborate UFO transmitters--constructed his first photometer in college; he started thinking about how to apply the technology to the search for extraterrestrial life shortly after arriving at NASA in 1962. It wasn't until the early 1980s, however, that Borucki began publishing papers on photometry and pushing his bosses to finance a photometric mission. Their response? It's impossible. Undeterred, his team slaved over the project for the next two decades, inventing new technologies, showing they could achieve the necessary precision, and applying for additional funding at every turn, until finally, in 2001, NASA "said uncle," as Borucki puts it. After only 10 days in orbit, the satellite measured a dip in starlight of a few parts per million caused by a distant Jupiter, proving that it's sensitive enough to detect Earth-like planets. **By 2013, says Borucki, Kepler is likely to have located "hundreds or even thousands" of potentially** **habitable worlds.**

Hundreds of civilizations exist

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact” www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf,, p. 1, 21, July 2011) SW

In recent years, scientists and the general public have realized that intelligent life may well be found throughout the universe. It is extremely unlikely that we are the only civilization in our galaxy. It may even contain dozens or hundreds of civilizations scattered among its 400,000,000,000 stars. If we receive a richly detailed message from one of these civilizations or engage in a lively dialogue, the effects on our civilization could be pervasive and profound. Contact with intelligent life from somewhere else in our galaxy will probably occur sometime in humanity’s future. It might take the form of a richly detailed radio or laser message from the distant civilization, for instance, or a super-intelligent probe that reaches our planet. Such contact might occur next year, or 20 or 30 years from now, or not for 100 years, or even longer. Few events in the entire sweep of human history would be as significant and far-reaching, affecting our deepest beliefs about the nature of the universe, our place in it, and what lies ahead for human civilization.

ETI Exist

Drake Equation proves alien existence

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 9, 21 July 2011) SW

Estimates of the number of extraterrestrial civilizations in our galaxy rest upon an elegant but simple heuristic known as the Drake Equation. This states that the number of extraterrestrial civilizations existing simultaneously with our own depends upon a combination of physical, biological, and social variables (Drake and Sobel, 1992). These are the number of suitable stars in our galaxy, the fraction of those stars that have planets, the fraction of those planets that give rise to life, the fraction of life forms that evolve into technologically advanced civilizations, and finally the average longevity of advanced civilizations. (Longevity is important because it affects the chances that civilizations will exist simultaneously.) In essence, as we proceed through the Drake Equation we eliminate sites that do not host extraterrestrial civilizations that coincide with our own. People who desire a positive search outcome hope that despite the many points for elimination, the resulting number of civilizations will be large. Since Drake formulated his equation in 1961, almost all findings support the “many inhabited worlds” hypothesis. These include discoveries that planets are common rather than rare in other solar systems (Croswell, 1997; Goldsmith, 1997; Marcy and Butler, 1998; Marcy et al., 1999); that complex organic molecules are commonly found in comets and in giant clouds where stars and planets form; and that the initiation of life may be a “cosmic imperative” that depends upon reliable principles of self-organization rather than nearly impossible chance events (Davies, 1998; de Duve, 1995; Kauffman, 1995). As suggested by the evaporation of the Cold War, societies may survive their own technological adolescence and achieve very old age with the result that many advanced societies exist at the present time. Despite growing circumstantial evidence, we have yet to confirm the existence of any extraterrestrial life.

The vastness of space means there are inevitably other advanced life forms

Shwartzman, professor of biology at Howard University, 2010

(David, “SETI Redux: Joining The Galactic Club,” *Astrobiology Magazine*, May 21, NS).

The first explanation is contrary to the subtext of astrobiology, the belief in quasi-deterministic astrophysical, planetary and biologic evolution. This view of life's inevitability in the cosmos is a view (or, shall I admit, a prejudice) I heartedly endorse. Most scientists active in the astrobiological research program would support an optimistic estimate of all the probabilities leading up to multicellular life on an Earth-like planet around a Sun-like star. I happen to be an optimist on this issue too. I have argued that encephalization - larger brain mass in comparison to body mass - and the potential for technical civilizations are not very rare results of self-organizing biospheres on Earth-like planets around Sun-like stars. Biotically-mediated climatic cooling creates the opportunity for big-brained multicellular organisms, such as the warm-blooded animals we observe on our planet. Note that several such animals have now been shown to pass the "mirror test" for self-consciousness: the great apes, elephants, dolphins and magpies, and the list is growing. But some, like my occasional collaborator Charley Lineweaver, an astrophysicist at Australian National University, are deep pessimists regarding the chances for other technical civilizations to emerge in the galaxy. He has argued, "humans and dolphins have 3.5 billion years of shared common ancestry. For 98 percent of our history, humans and dolphins were the same. The genes needed to develop those big brains had been fine-tuned over billions of years of evolution and were already in place." Lineweaver says that if advanced civilizations do emerge elsewhere in the galaxy, we can't expect they'll have human-like intelligence. This deserves an essay in itself. But if the pessimists concede just one of the millions if not billions of Earth-like planets is the platform for just one technical civilization that matures to a planetary stage, advancing beyond our present primitive self-destructive stage, just one advanced civilization with the curiosity to spread through the galaxy, at sub-light speeds with Bracewell probes to explore and document an Encyclopedia Galactica, then what should we expect?

ETI Exist

There are many habitable planets for SETI to search

Kauffman, astrobiology correspondent, 2011

(Mark, “It’s Alive Out There!” Saint Paul Pioneer Press, 6/11, NS)

This hidden-in-plain-sight campaign is the renewed scientific push to find signs of life, or of past life, beyond the confines of our planet. The umbrella science that organizes the effort is called astrobiology, and the field is making surprising and compelling progress. It still may well be years before science finds anything that is clearly extraterrestrial life, but scientists are more convinced than ever of the existence of alien life, and they have the newly sophisticated (and still quickly evolving) tools and knowledge to actually find it. The scientific breakthroughs of the field reflect its breadth: Astrobiology takes in fields ranging from microbiology to chemistry, astronomy and planetary science to cosmology. From the world of microbiology, for instance, scientists have learned that microbial life is far more tenacious than ever imagined, and able to survive deep underground, in glaciers, alongside hydrothermal vents, and even floating in the atmosphere. From astrochemistry we have learned that all of the elements and molecules needed for life as we know it - hydrogen, oxygen, nitrogen, water, and complex carbons - are present throughout the universe. These non-living building blocks need planets to land on where they can possibly interact in ways that can lead to biology and life, and now we know that such planets (or exoplanets, as they're called) are common. More than 500 have been positively identified in the past 15 years, 1,200 new candidate planets were discovered by NASA's Kepler mission this year, and astronomers now are convinced there are billions, and maybe hundreds of billions, of exoplanets in the Milky Way and beyond. What's more, techniques for finding exoplanets have evolved to the point that several groups have claimed to have located "Goldilocks" planets - those orbiting their suns at a distance where water won't always be either boiling or freezing.

Absent results do not disprove existence of a more advanced civilization

Shwartzman, professor of biology at Howard University, 2010

(David, “SETI Redux: Joining The Galactic Club,” *Astrobiology Magazine*, May 21, NS).

This proposed program has a critical distinction from virtually all of observational SETI: detecting a targeted beacon from ET requires that they intended to send one. The absence of evidence it not necessarily evidence of absence, if intention is lacking. On the other hand, for a relatively short time, primitive civilizations like us leak radio waves to space, unintended signals that we could potentially detect. The technical requirements for a galaxy-wide search are dictated by the size of the radio telescope, with the detection range proportional to the effective diameter of the telescope. A large enough radio telescope situated in space could potentially set meaningful upper limits on the rate of emergence of primitive Earth-like civilizations ('N/L' in the Drake equation), without ever actually detecting the leakage radiation of even one ET civilization. But just how big a telescope is required for this project, and at what cost? Our 1988 paper provided such estimates: a dish diameter on the order of 500 kilometers, at a cost of roughly $10 trillion. Perhaps the cost has come down somewhat (but note the estimate was in 1988 dollars). This is surely a project with a vanishingly small chance of implementation in today's world. I could only conceive of a demilitarized newly mature planetary civilization, call it Earth-United (Finally!), with any intention of implementing such an ambitious project that has no apparent immediate practical benefits. Then and only then would we successively detect a message from the GC, presumably faint enough to be only detectable with a huge radio telescope in space. On the other hand, the GC may be monitoring biotically-inhabited planets by remote Bracewell probes that have programmed instructions. Such a probe would plausibly be now hiding in the asteroid belt (as Michael Papagiannis once suggested). If the GC exists, there was ample time to set up this surveillance system long ago. Surveillance probes so situated in planetary systems would send welcoming signals to newly mature civilizations, with the potential for a real conversation with artificial intelligence constructed by the GC, if not reconstructed biological entities. If this proposed surveillance system is absent, we should expect the GC to use highly advanced telescopes to monitor planetary systems that have prospects for the emergence of intelligent life and

technical civilizations. These alien telescopes could use gravitational lenses around stars. Planetary system candidates to the GC could expect to receive continuous beacons, but the signals would be very weak or disguised so that they would only be decipherable by newly mature civilizations that just pass the entrance requirements.

A2 Fermi’s Paradox

Fermi’s paradox assumes that our development is the standard for the development of extraterrestrial colonies.

Cirkovic, scientist at the Astronomical Observatory of Belgrade, Vukotic, astrophysicist at the Astronomical Observatory of Belgrade, 2008

(Milan M, Branislav, “Astrobiological Phase Transition: Towards Resolution of Fermi's Paradox,” Springer Science Astrobiology, September 22, NS)

Thus, for multiple reasons, an astrophysical (necessarily "bard") explanation of Fermi's paradox would be vastly preferable over a sociological or any other kind. Herein, we show that such an explanation is indeed forthcoming—recent advances in astrophysics and astrobiology presented us with a uniquely convenient starting point for advancing such an explanation. The core of the present astrobiological phase transition (APT) model can be encapsulated in the statement that we are not living in the epoch of astrobiological equilibrium. Much of the tension caused by Fermi's paradox stems from the tacit assumption of equilibrium state; once that assumption is abandoned, we are faced with a wider spectrum of possibilities which depend on the unknown "astrobiological dynamics": rates of biogenesis (origination of life) and noogenesis (origination of intelligence) on distant habitable planets as functions of their total physical, chemical, and ecological parameter? Fermi's paradox acts as a boundary condition on all possible astrobiological models, and for each imaginable astrobiological history we can ask the simple question: "How probable under this history is it that the newly-emerged observers at a typical point will face Fermi's question?'

AT: Empirically Fails

Past failures don’t matter- new technology solves multiple contacts

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf p.4, 21 July 2011) SW

This report, then, is neither a traditional “proceedings,” nor a traditional review of the literature. Instead, it combines the best features of both forms. In this way it provides fresh, lively insights into the long-term impact when SETI succeeds. SETI has not yet succeeded in detecting any repeatable evidence. But the range of strategies and the intensity of the efforts are growing rapidly, making success all the more likely in the next few decades. More than one strategy may succeed, of course, so that by the year 3000 we may well be engaged in dialogue with several different civilizations (or other forms of intelligence) that originated in various parts of our Milky Way galaxy.

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There are so many planets suitable for life that absent results should not dissuade continuing searches

Connor, columnist, 2010

(Steven, The Pretoria News, 16, April 15, NS)

It is one thing to be able to detect alien life on another planet and another to find intelligent life that can travel or communicate through the distances of interstellar space. Dr Frank Drake, a veteran US astronomer who was one of the first to conceive the idea of a co-ordinated search for extraterrestrial intelligence (Seti), devised an equation nearly 50 years ago for calculating the potential number of planets in the Milky Way galaxy suitable for life - however, he now believes we may have seriously underestimated the potential places in space where life may exist. "A realistic picture should includethe contributions to habitability of deep atmospheres, thick ice layers, even the solid surface itself, all of which can lead to life-supporting near-surface temperatures," he said. "Even the very numerous red- dwarf star planets may be rendered habitable by a substantial atmosphere or by an eccentric orbit... almost all of the Milky Way becomes a suitable search target." Drake said the fact that we had not detected any extraterrestrial signals of intelligent life after nearly half-a-century of listening with powerful radio telescopes should not dissuade us from further searches with better instruments.

SETI has only tried a few ways of contacting aliens

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 9, 21 July 2011) SW

As we look to the distant future, we should realize that the dominant microwave search strategy is only one way that we could discover extraterrestrial life (Tough, 1999). At some point we may switch to active SETI (sending encoded signals rather than passively receiving them), or major advances in such areas as transportation and communication may give rise to new search strategies. New scientific discoveries could generate scientific interest in strategies (such as UFO studies) that are now largely discredited or, like planetary archaeology, seem unlikely to work. We must even be open to the possibility that contact has occurred in the past and we are living with the consequences of this contact. Right now, not one of these strategies has yielded scientific proof.

AT: Violent Aliens

We can’t predict alien behavior

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 9, 21 July 2011) SW

Universal principles of behavior are the third avenue to generating hypotheses about ETI. If successive discoveries imply universal principles in the physical and biological sciences, it is conceivable that there are universal principles in the behavioral sciences also (Harrison, 1993, 1997). Perhaps there are deep laws of individual and social behavior that hold true for all species, all times, and all cultures. If so, our knowledge of biological and social entities on Earth gives us a starting place for organizing our thinking about intelligent life elsewhere. Although Earth is only one case, nested within it is a multitude of examples—millions of species, thousands of cultures, hundreds of nations spanning a written history extending back over 5,000 years. Neither reverse At the conceptual level, our search for extraterrestrial life is based on a hunger for knowledge and a desire to find new purpose in the universe. Neither reverse engineering nor the search for universal principles of behavior can give us more than an educated guess about ETI…

Encounters with aliens would be peaceful—will have evolved beyond exploitation

Shermer, Columnist Scientific American, 11

(Michael, June, Scientific American, Volume 304, Issue 6, p86-89, EBSCO, “The Myth of the Evil Aliens”) PG

I am skeptical. Although we can only represent the subject of an N of 1 trial, and **our species does have an unenviable track record of first contact between civilizations**, the data trends for the past half millennium are encouraging: colonialism is dead, slavery is dying, the percentage of populations that perish in wars has decreased, crime and violence are down, civil liberties are up, and, as we are witnessing in Egypt and other Arab countries, **the desire for representative democracies is spreading, along with education, science and technology**. **These trends have made our civilization more inclusive and less exploitative.** If we extrapolate that 500-year trend out for 5,000 or 500,000 years, we get a sense of what an ETI might be like. **In fact, any civilization capable of extensive space travel will have moved far beyond exploitative colonialism and unsustainable energy sources**. Enslaving the natives and harvesting their resources may be profitable in the short term for terrestrial civilizations, but such a strategy would be unsustainable for the tens of thousands of years needed for interstellar space travel. In this sense, **thinking about extraterrestrial civilizations forces us to consider the nature and progress of our terrestrial civilization and offers hope that, when we do make contact, it will mean that at least one other intelligence managed to reach the level where harnessing new technologies displaces controlling fellow beings and where exploring space trumps conquering land.** Ad astra!

AT: Violent Aliens

If we found aliens they wouldn’t be hostile towards our civilization

Tough PhD Professor at the University of Toronto 91

(Allen Tough PhD Professor at the University of Toronto: “Intelligent Life in the Universe: What Role Will It Play in Our Future?” 1991 <http://ieti.org/tough/articles/bok.htm> MLF 6-21-11)

I concluded that most or all of the advanced civilizations in the universe avoid harming fledgling civilizations. The cardinal principle guiding behavior toward all other civilizations is probably this: avoid unnecessary harm and interference. Do not hurt any other civilization, nor hinder their development. If another civilization is clearly about to break the cardinal rule (through a powerful attack or through spreading a plague, for instance), and if this poses a definite and immediate threat to an advanced species, then it is permissible to intervene powerfully and even harmfully in order to prevent this. Under any other circumstances, however, an advanced civilization will probably not interfere harmfully in the development of another civilization.

There are several reasons for concluding that advanced beings are helpful or at least benign, and are unlikely to harm fledgling civilizations such as ours. Here are the main reasons:

1. They still recall their own early history, including their primitive stages, their dark periods, and their follies; therefore, they may feel sympathetic toward our foibles.

2. Anyone bent on capturing our planet would have done so long ago, before we despoiled it so much.

3. Any hostile civilization with advanced technology would have programmed its robot Replicator probes to eliminate any potential civilization long before reaching the stage at which it could attack the Replicator; that is, long before our present stage (O'Neill, 198l, p. 265).

4. Advanced civilizations are probably letting us develop freely, without interference, in order to maximize the amount of information they gain; if they interfere and control us, they will learn less (Kuiper and Morris, 1977). Their greatest gain from us may be sociological and anthropological knowledge about our culture and civilization.

5. Intelligent life forms that are destructively aggressive and irresponsible will usually eliminate themselves or revert back to primitive conditions before they achieve interstellar communication or travel (Harrison, 198l). If a ruthlessly hostile species manages to avoid these usual consequences of natural selection, and then prepares for interstellar communication or travel, it may well be terminated by more advanced beings in the galaxy. "How this is done is a matter of more than academic interest to the human race in the next few centuries," adds Harrison, wryly.

AT: ET Domination

No Domination

Wall, SPACE.com Senior Writer, 11

(Mike, Space.com, January 10, “Study: If we’re not alone, we should fear the aliens”, http://www.space.com/10578-study-fear-aliens-dangerous-extraterrestrials.html) PG

And, though he doesn't advocate letting our guard down, Harrison is not quite as worried about aliens' possible malignant intentions as Conway Morris is. **It's not necessarily inevitable that alien civilizations advance to stages of interstellar imperialism, cruising the cosmos for resources,** Harrison said. Despite the atrocities leading the news every night, **societies here on Earth seem to be trending more toward peaceful coexistence,** Harrison said. And **even if an alien civilization got greedy and imperialistic, there's no guarantee it would be able to run roughshod over its neighbors.** "It's possible to have very acquisitive civilizations out there," Harrison said. "Maybe they get to a certain point, **but they may collapse or be beaten back. No one civilization is necessarily going to take over, because there will be coalitions of other civilizations that will keep them in check."**

AT: Hawking – Contact is Safe

Hawking is wrong-friendly contact with aliens is possible

Shermer, columnist for the Scientific American, 11

(Michael, The Scientific American, 5/19/11 http://www.scientificamerican.com/article.cfm?id=the-myth-of-evil-aliens, accessed 6/21/11, HK)

With the Allen Telescope Array run by the SETI Institute in northern California, the time is coming when we will encounter an extraterrestrial intelligence (ETI). Contact will probably come sooner rather than later because of Moore’s Law (proposed by Intel’s co-founder Gordon E. Moore), which posits a doubling of computing power every one to two years. It turns out that this exponential growth curve applies to most technologies, including the search for ETI (SETI): according to astronomer and SETI founder Frank Drake, our searches today are 100 trillion times more powerful than 50 years ago, with no end to the improvements in sight. If E.T. is out there, we will make contact. What will happen when we do, and how should we respond? Such questions, once the province of science fiction, are now being seriously considered in the oldest and one of the most prestigious scientific journals in the world—Philosophical Transactions of the Royal Society A—which devoted 17 scholarly articles to “The Detection of Extra-Terrestrial Life and the Consequences for Science and Society” in its February issue. The myth, for example, that society will collapse into fear or break out in pandemonium—or that scientists and politicians will engage in a conspiratorial cover-up—is belied by numerous responses. Two such examples were witnessed in December 2010, when NASA held a very public press conference to announce a possible new life-form based on arsenic, and in 1996, when scientists proclaimed that a Martian rock contained fossil evidence of ancient life on the Red Planet and President Bill Clinton made a statement on the topic. Budget-hungry space agencies such as NASA and private fund-raising organizations such as the SETI Institute will shout to the high heavens about anything extraterrestrial they find, from microbes to Martians. But should we shout back to the aliens? I am skeptical. Although we can only represent the subject of an N of 1 trial, and our species does have an unenviable track rec­ord of first contact between civilizations, the data trends for the past half millennium are encouraging: colonialism is dead, slavery is dying, the percentage of populations that perish in wars has decreased, crime and violence are down, civil liberties are up, and, as we are witnessing in Egypt and other Arab countries, the desire for representative democracies is spreading, along with education, science and technology. These trends have made our civilization more inclusive and less exploitative. If we extrapolate that 500-year trend out for 5,000 or 500,000 years, we get a sense of what an ETI might be like. In fact, any civilization capable of extensive space travel will have moved far beyond exploitative colonialism and unsustainable energy sources. Enslaving the natives and harvesting their resources may be profitable in the short term for terrestrial civilizations, but such a strategy would be unsustainable for the tens of thousands of years needed for interstellar space travel. In this sense, thinking about extraterrestrial civilizations forces us to consider the nature and progress of our terrestrial civilization and offers hope that, when we do make contact, it will mean that at least one other intelligence managed to reach the level where harnessing new technologies displaces controlling fellow beings and where exploring space trumps conquering land. Ad astra!

AT: Public Panic

The public will not panic to E.T. discovery

Tough, founder and chief scientist of *Invitation to ETI*, 1990

(Allen, “A CRITICAL EXAMINATION OF FACTORS THAT MIGHT ENCOURAGE SECRECY,” Acta Astronautic, Vol. 21, No. 2, pp. 97-102, http://www.ieti.org/articles/acta2102.pdf) KA

*2.1 Critical Examination of Panic* When these reasons for secrecy are examined critically, they turn out to be unconvincing and unnecessary. First, present knowledge in the social sciences indicates that widespread public panic is highly unlikely. Additional research could be conducted, however, to test the likely reactions of people around the world. If the research discovers any potential problems, steps could be planned to reduce them. Second, millions of people already believe in extraterrestrials, yet continue working at their jobs, raising their children, and generally carrying on a normal life. Supermarket tabloids often announce extraterrestrial contact with large headlines, but no one panics. A recent Gallup Poll in the United States found that about half of all adults believe that intelligent life exists elsewhere in the Universe. Various movies and television series in the past few years have prepared people for positive contact with extraterrestrials. Third, public panic might well occur if the message announced an eminent attack or widespread abductions. A hostile message is unlikely, though[2]. In addition, because the deciphering of any message is not likely to occur until long after the signal is first detected, there is no need for secrecy in the early stages.

SETI has acclimated the public to the appearance of extraterrestrials; arrival of E.T. would not cause panic

Von Radowitz, science journalist, 2011

(John, January 10, Irish Examiner, http://www.irishexaminer.com/world/kfeykfgbeykf/rss2/, NS)

Times have changed dramatically since 1961 when the US Congress was warned evidence of extra-terrestrials would lead to widespread panic, argued psychologist Dr Albert Harrison. First contact with ET, or the discovery of ancient alien relics on Earth or Mars, would probably be met with delight or indifference today, he believes. Dr Harrison, from the University of California at Davis, US, wrote in the journal Philosophical Transactions of the Royal Society: "The discovery of ETI (extra-terrestrial intelligence) may be far less startling for generations that have been brought up with word processors, electronic calculators, avatars and cell phones as compared with earlier generations used to typewriters, slide rules, pay phones and rag dolls." People had been getting used to the idea of ET since the Seti (Search for Extra-Terrestrial Intelligence) project first began listening out for alien radio signals 50 years ago, said Dr Harrison. Today, surveys suggested half the population of the US and Europe believe extra-terrestrials exist, and a "substantial proportion" were convinced aliens had already visited the Earth. As long ago as the 1840s a popular New York newspaper reported on the discovery of "batmen" on the Moon. Later it was widely accepted that astronomers had found evidence of canals built by a dying civilisation on Mars. In the 1960s scientists suspected that quasars and pulsars, galaxies and stars that emit powerful bursts of energy, might be intelligently controlled, said Dr Harrison. And in 1996 the American space agency NASA announced it had found fossil evidence of life on Mars, in the form of a meteorite containing alien bugs. In North America and Europe at least, neither the discovery of an alien specimen nor the detection of a "dial tone at a distance" were likely to lead to "widespread psychological disintegration and collapse".

AT: Destroys Religion

E.T. discovery would not ruin religions

Tough, founder and chief scientist of *Invitation to ETI*, 1990

(Allen, “A CRITICAL EXAMINATION OF FACTORS THAT MIGHT ENCOURAGE SECRECY,” Acta Astronautic, Vol. 21, No. 2, pp. 97-102, http://www.ieti.org/articles/acta2102.pdf) KA

3.1 Critical Examination of the Impact on CultureThese outcomes could occur only if a detailed encyclopedic message is received and deciphered. Even then, they are highly unlikely. Religions have flourished over the centuries despite a variety of fundamental scientific discoveries. Quoting Frazier again: Institutions, especially those with a good record for endurance, have a certain amount of stretch built into them; thus it may be an underestimation of their resiliency to expect them automatically to crumble at the first hello from elsewhere in the galaxy. Many theologians and humanists who exalt the special status and uniqueness of humankind on earth see no contradiction in holding to that view while also acknowledging the virtual certainly of there being more intelligent beings elsewhere[4].

AT: Culture Shock

E.T. discovery would not ruin current culture – too many fundamental values, survived through scientific discoveries before

Tough, founder and chief scientist of *Invitation to ETI*, 1990

(Allen, “A CRITICAL EXAMINATION OF FACTORS THAT MIGHT ENCOURAGE SECRECY,” Acta Astronautic, Vol. 21, No. 2, pp. 97-102, http://www.ieti.org/articles/acta2102.pdf) KA

A historical survey found that several religions have already incorporated or even emphasized the idea of extraterrestrial life [5]. Although some preachers may denounce an extraterrestrial signal as the work of the devil or the Anti-Christ (and even urge that scientists have nothing further to do with it), others will surely embrace it as further evidence of God's infinite greatness. Indeed, both religion and philosophy may be beneficially stimulated by an extraterrestrial message. If certain fields of science and certain technologies become outmoded, that will simply be a sign that the information received is powerful and useful. Sciences, technology, and the economy have successfully withstood many other fundamental changes over the decades and have often (perhaps after a period of disruption) ended up further ahead. Will contact with an advanced alien culture inevitable harm our human culture? *The Extraterrestrial Encyclopedia* points out that contact between two terrestrial cultures has always involved physical contact. This situation is quite different from contact through radio signals in which a round trip exchange of information would require many years. Also, terrestrial contact has usually involved territorial expansion by the stronger culture. "If contact occurred without aggression, the lesser culture has often survived and even prospered [6]."

AT: Contact Bad – Already aware of us

Extraterrestrials have awareness of humans

Tough, PhD UChic, 91

(Allen, Prof. OISE, founded Invit. to ETI, Journal of British Interplanetary Society, Vol. 39, pp 492, “What Role will extraterrestrials play in humanity’s future?”) PG

It is highly likely that some advanced extraterrestrials know about us. In addition to basic knowledge about us. they may also have highly detailed information.This conclusion is based on two factors: capacity and motiva­tion. We saw in the previous section how highly advanced the capacities at someexlraterrestrialsarc, compared to our present level of development It seems highly likely that they are capable of observing, monitoring, or studying us if they wish to do so. Believing that we "vastly underrate the abilities of LI I." John Ball has stated that "we'll certainly start studying and cataloguing biosystcms in the Galaxy as soon as we're able: why should ETI do less?" (SJ. Their motivations to do so might include their own protection and security, and their desire to help us develop. In addition, they could be motivated by curiosity and scientific study; for example, within the field of comparative civilisations, some scholars may study the similarities and differences among various civilisations and planets in our Galaxy. On their equiva­lent of videocasseties, some extraterrestrials may want to record certain aspects of our musk, art, games, recreation, loving deeds, thoughts, laws, customs, insights, appearance, dwelling places, technology, culture, and landscape.

No ETI = Human Expansion

If humans don’t find ETI’s it will give them the green light to expand across the universe

Harrison, PhD Professor at UC Davis and Dick Served as Chief Historian at NASA, 2000

(Albert is a PhD Professor of Psychology at UC Davis and Steven Served as Chief Historian at NASA When SETI Succeeds: The Impact of High-Information Contact Edited by Allen Tough “Contact: Long-Term Implications for Humanity” p. 11 <http://ieti.org/tough/books/succeeds/sectII.pdf> MLF 6-22-11)

If the search continues for centuries, perhaps to the dawn of the next millennium, then we will live with the implication that we are alone in the universe. We will conclude that the circumstantial evidence assembled during the 20th century was misleading. Ben Finney suggests that if we do not ﬁnd ETI, we ourselves may be encouraged to spread the universe with intelligent life: However sobering [no conﬁrmation would be] for cosmic evolutionists, those interested in human space expansion would certainly take the apparent absence of extraterrestrials in our galactic neighborhood as a green light for humanity spreading throughout that region. Let us further imagine that through learning how to settle in and around various planets and smaller bodies of our solar system and the development of powerful space drives and multi-generation spaceships, humans would eventually be able to migrate to nearby star systems and found viable communities there. Then frustrated would be students of independently evolved extraterrestrials would have the opportunity to study how our descendants evolve culturally and biologically as they scatter through space… (Finney, 1999)

\*\*\*Space Debris Adv.\*\*\*

Debris Increasing

Increasing amount of avoidance procedures is evidence of increasing space debris

Shoots, managing director of NASA’s Johnson Space Center, 2011

(Debi, “United Nations Discusses Space Debris and Long-Term Sustainability of Activities in Outer Space,” Orbital Debris Quarterly, 2:15, p.1, April, NS)

One common theme was the increasing numbers of collision avoidance maneuvers conducted in the previous year to prevent potentially catastrophic encounters among resident space objects. NASA reported seven such maneuvers by its fleet of robotic satellites and one for the International Space Station, while France and ESA acknowledged 13 and 9 maneuvers, respectively, for spacecraft under their control.

ATA Key Tracking/Safety

The ATA could be used by the Air Force Space Command to improve space safety

The SETI Institute 9

(The SETI Institute, “AFSPC explores Allen Telescope Array for Space Surveillance,” 5-19 , <http://www.seti.org/afspc> , 6-22-11,GJV)

**AFSPC is one of a few organizations responsible for obtaining and maintaining the awareness needed for successful and safe space operations. The command develops, maintains and shares a comprehensive and accurate catalog of orbiting space objects, while constantly seeking methods to improve their Space Surveillance Network (SSN), a global network of radar and optical sensors that detect and track orbiting space objects. AF Space Command is exploring opportunities in academia and the commercial sector that could provide suitable cost-effective means for augmenting the Space Command's Space Surveillance mission. The Allen Telescope Array (ATA), located at the Hat Creek Radio Observatory, 290 miles northeast of San Francisco, California is a tool with strong potential for use by AFSPC in support of the Department of Defense’s Space Surveillance mission.** The ATA is a radio interferometer that is dedicated to cutting-edge astronomical research. This array of antennas is optimized to receive and process a very wide portion of the radio spectrum and can stare at many areas of the sky at once. **AFSPC, through the Space Innovation and Development Center (SIDC), is currently researching the possible use of the ATA to augment the already extensive sensors of the Space Surveillance Network, potentially leveraging the array to help increase space situational awareness. Initial demonstrations show promise for the ATA to track transmitting satellites in Low Earth Orbit, Medium Earth Orbit and, most promising, in Geosynchronous Orbit (GEO), which is home to the most costly, highly-utilized, and vital satellites that orbit the earth.** A collision and subsequent debris field in GEO could permanently remove the GEO belt from worldwide use. AFSPC is working with the SETI Institute, and its partner, the Radio Astronomy Laboratory at the University of California, Berkeley. These partners currently operate the ATA. The effort is to demonstrate the array’s capability of accurately surveying the GEO belt by demonstrating the array’s capability of precisely locating objects in that area, in an effort to avoid a devastating collision in GEO. The ATA may prove to be a viable and sensitive SSN sensor, capable of all-weather, day and night operations, and will hopefully lead to improved space safety.

Air Force should Fund

The US Air Force could fund SETI to track space debris

Brenner, co-editor of the LAist, 2011

(Lisa, “Close Encounters Of the Broke Kind: SETI Hangs Up On E.T,” The LAist, April 26, http://laist.com/2011/04/26/close\_encounters\_of\_the\_broke\_kind.php NS)

SETI director Tartar estimates $5 million is needed over the next two years and hopes the U.S. Air Force will share the expense since the Allen Telescope Array can also be used "to track satellite-threatening debris in space.

The US Air Force has worked with SETI to monitor space debris

Hachman, news editor for PC Magazine, 11

(“SETI Alien-Hunting Telescope Array Shut Down After Funding Slows,” April 26, http://www.pcmag.com/article2/0,2817,2384340,00.asp, accessed June 22, 2011, NS)

Part of the Institute's early work was in conjunction with the U.S. Air Force, which provided funding so that the SETI Institute could monitor local space debris. The SETI Institute had hoped that it might next explore 1,235 so-called "Kepler worlds" where exoplanets had been identified, increasing the chances that alien communications might be discovered.

SETI Institute would cooperate with the US Air Force to track down space debris

UPI Science News 11

(“Telescopes looking for alien life shut off,” <http://www.upi.com/Science_News/2011/04/25/Telescopes-looking-for-alien-life-shut-off/UPI-81201303770117/>, April 25, NS)

The ATA is a partnership between the SETI Institute, which built the telescope array, and the University of California, Berkeley, which is responsible for operating it. The non-profit SETI Institute, founded in 1984, relies mostly on private donations to support its research. A number of early SETI Institute projects had been funded by NASA, but Congress stopped NASA's short-lived SETI program in 1993. The SETI Institute has been working for more than two years to find new funding, Person said, and has even offered ATA's services to the U.S. Air Force to assist in tracking orbital debris that can endanger defense satellites.

SETI Institute is willing to use its resources to track orbital debris for the US Air Force

Sahagan, Pulitzer prize winning staff writer at the LA Times, 2011

(Louis, ” Hello? Anyone out there with a pen and a checkbook?; Telescope project's hunt for alien life hits budgetary black hole,” LA Times, p. 1, May 7, NS)

The nonprofit SETI Institute, the Bay Area organization that runs the Allen Telescope Array, is scrambling to keep the project alive. Proposals under consideration include helping the U.S. Air Force track space debris in return for operating funds, and a "citizen scientist" program that would enable people to link up with radio telescope receivers at a cost of about $5 per minute.

AT: Other Tracking Solves

The ATA provides the Air Force with a very large dish antenna at a cheaper cost, allows daytime observation

SETI Institute 9

(The SETI Institute , “AFSPC explores Allen Telescope Array for Space Surveillance,” 5-19, <http://www.seti.org/afspc> , 6-23-11,GJV)

The unique design of the Allen Telescope Array (ATA) is intriguing to the Air Force because it provides a similar sensitivity to a very large dish antenna, but at a cheaper cost for the same collecting area. This is known as a Large-Number Small-Diameter concept, and fits well with the Air Force’s goal of conducting its mission in a fiscally responsible manner. The AF working with the ATA may be a natural win-win relationship. Specifically, the AF requires additional sensors to observe orbiting objects during the daytime, because many of its Electric-Optical (EO) sensors are affected by light pollution during the day, which limits the observations that can be conducted at that time. The ATA's primary missions, searching for extraterrestrial life and scientific research, are most often conducted at night, because this gives them the best pointing stability and avoids decrease in the strength of narrow band signals due to scattering by the solar wind. Operating the ATA during the daylight hours for the AF allows the array to be more fully utilized while not detracting from its scientific and SETI goals, and may provide the AF with vital daytime observations. To be utilized as a viable long-term sensor for the SSN, the ATA has to demonstrate many characteristics besides accurately being able to observe orbiting satellites. Its data have to be consistent, timely, precise, sensitive, and have a throughput that makes it worth the cost of a long-term investment by the Air Force. If these factors demonstrate themselves, the ATA may be integrated into the SSN to help to ensure the safety of flight of objects in space.

The ATA can track satellites in daylight, which other sensors cannot do

The SETI Institute , 09

(The SETI Institute, “AFSPC explores Allen Telescope Array for Space Surveillance,” 5-19 , http://www.seti.org/afspc , 6-22-11,GJV)

Future tasks for the ATA will include demonstrating the capability to track objects besides GPS. Additionally, tasks such as tracking objects during the daylight hours, or with the sun or moon in field of view, will further demonstrate the capabilities of the ATA as a sensor for the SSN. These demonstrations are important because many of the current sensors have difficulty with light-pollution, which hampers observations. If the ATA can demonstrate its capability to precisely locate satellites in all orbits, during day or night, it increases it significance as a SSN sensor, and increases the overall safety of space.

AT: Manual Removal of Debris

Manual space removal technology is too expensive and the tech doesn’t exist

Ansdell , Graduate Student in the Master in International Science and Technology Policy program In Washington , 10

(Megan , Princeton University , “Active Space Debris Removal: Needs, Implications, And Recommendations For Today’s Geopolitical Enviorment,” <http://www.princeton.edu/jpia/past-issues-1/2010/Space-Debris-Removal.pdf>, 6-25-11 , GJV)

There are substantial technical, economic, political, and legal barriers to developing, deploying, and operating active debris removal systems. Many current concepts rely on unproven technology, which means they will require substantial time and money to develop and deploy. The quantity of time and money required will vary with each concept, and detailed estimations are not publicly available because of the nascent state of the ﬁeld. However, as a rough point of reference, it costs around $10,000 per kilogram to launch anything into orbit, making the cost of merely launching many of the aforementioned systems on the order of millions of dollars. Moreover, ﬂagship missions at NASA, depending on their size, take ﬁve to ten years to plan, develop, and launch. There is also a lack of clear policy on both national and international levels. Space-faring countries and the United Nations have only adopted mitigation guidelines and have not cited the development of active debris removal systems as part of their space policies. Moreover, there has been a lack of discussion about what entity is responsible for ﬁnancing and operating these systems. This is a complicated issue as some nations have created more debris than others, yet all space-faring nations and users of satellites services would beneﬁt from space debris clean up.

Manual space removal systems can be mistaken as space weapons

Ansdell , Graduate Student in the Master in International Science and Technology Policy program In Washington , 10

(Megan , Princeton University , “Active Space Debris Removal: Needs, Implications, And Recommendations For Today’s Geopolitical Enviorment,” <http://www.princeton.edu/jpia/past-issues-1/2010/Space-Debris-Removal.pdf>, 6-25-11 , GJV)

Another major concern is the similarities between space debris removal systems and space weapons. Indeed, any system that can remove a useless object from orbit can also remove a useful one. There is an extensive and ongoing debate over space weapons, and in particular how to deﬁne them (Moltz 2008, 42-43). As the decades-long debate has failed to even produce a clear deﬁnition of the term, it will be nearly impossible to actively remove space debris without the use of devices that could be classiﬁed in some way as potential space weapons. Thus, openness and transparency will be an important element in the development, deployment, and operation of any space debris removal system so that it is not seen as a covert ASAT weapon.

AT: ATA won’t work with Air Force satellites

The ATA is complimentary to the existing Air Force sensors.

The SETI Institute , 09

(The SETI Institute, “AFSPC explores Allen Telescope Array for Space Surveillance,” 5-19 , <http://www.seti.org/afspc> , 6-22-11,GJV)

The ATA has numerous unique capabilities for astronomy and SETI research, and because it is the first instrument of its type, some of its capabilities may enhance Air Force daylight space surveillance capabilities.

Heg Scenario Extensions

Air force satellites are key to U.S. hegemony

Albanesius, staff writer, experience in finance and technology for years, 11

(Chloe, worked for a year covering financial IT on Wall Street for Incisive Media, covered technology policy for The National Journal's Technology Daily in Washington, DC., graduated with a bachelor's degree in journalism from American University in Washington, D.C., May 9, “Air Force Launches Satellie for Missile Tracking, Warnings,” PCMAG, http://www.pcmag.com/article2/0,2817,2385092,00.asp) KA

The Air Force on Saturday successfully launched a satellite that will provide the government with a new missile warning system. The Space Based Infrared System (SBIRS) GEO-1 launched aboard a United Launch Alliance Atlas V vehicle at 2:10pm Eastern from Cape Canaveral Air Force Station in Florida, and separated from the booster 43 minutes later. It then completed a series of orbit maneuvers intended to propel it to geosynchronous orbit. When it reaches orbit, engineers will deploy the satellite's solar arrays and antennas and conduct several tests before putting it to work. "This launch success represents years of dedication and hard work by a broad team of government and industry professionals," Brig. Gen. Roger Teague, director of SMC's Infrared Space Systems Directorate, said in a statement. "We look forward to GEO-1 soon joining our constellation of overhead persistent infrared satellites and providing critical national security space capabilities." The launch was originally scheduled for May 6, but inclement weather prompted the team to push it to Saturday. The GEO-1 includes staring and scanning sensors, and can be used for missile warning, missile defense, and battlespace awareness. It can also provide data to deployed warfighters, national leadership, and U.S. allies. The Air Force said the launch "represents the dawn of a new era in overhead surveillance." "Our mission is just beginning, and we look forward to developing new capabilities that will expand the overhead persistent infrared missions to meet global emerging threats," said Col. Scott Larrimore, SBIRS Space Systems Division chief. This was the 26th launch for the Atlas V, which was provided by United Launch Alliance. ULA is a 50-50 joint venture between Lockheed Martin and Boeing, which was formed in 2006 to provide access to space for U.S. government missions. Lockheed partnered with the Air Force on this particular mission. "Throughout the development of this first-of-its-kind satellite, the SBIRS team has demonstrated an unwavering commitment to operational excellence," said Jeff Smith, Lockheed Martin's vice president and SBIRS program director. In March, ULA collaborated with the Air Force Rapid Capabilities Office (AFRCO) to launch a secret spy plane. The device, known as X-37B, departed via the Atlas V launch vehicle at from Cape Canaveral, flew itself across the country, and landed at Vandenberg Air Force Base in California. In November, the Air Force Air Force successfully launched the ULA Delta IV Heavy Rocket, which carried a classified National Reconnaissance Office (NRO) satellite. Several months later, the Delta IV Heavy launched again with a National Reconnaissance Office (NRO) spy satellite called NROL-49.

Heg Scenario Extension

Space debris will destroy satellites and make us vulnerable to ASAT technology

David, co-director of the Global Security Program and expert in defense weapons, 2009

(Wright, “Space Debris from Anti-Satellite Weapons,” Union of Concerned Scientists, April, NS)

Debris in low Earth orbit travels 30 times faster than a commercial jet aircraft. At these speeds, pieces of debris larger than 1 cm (half an inch) can severely damage or destroy a satellite, and it is not possible to shield effectively against debris of this size. The Chinese destruction of a relatively small satellite roughly doubled the debris threat to satellites in the most heavily used part of LEO. Fortunately, the debris threat to satellites is still relatively small, but continued testing of destructive ASAT weapons against satellites, or their use against several large satellites in a conflict, could result in a much higher risk. ASAT weapons could therefore significantly increase the cost of using space, and could hinder using regions of space that today are widely used for a range of purposes. Beyond that, the sudden loss of a satellite due to debris during a crisis could remove important capabilities, or could lead to dangerous reactions and the escalation of the crisis, especially if the adversary was known to have an ASAT capability.

Military satellites provide the necessary guidance to enable safe bomb and missile strikes that don’t harm civilians

Moore , research fellow with the Independent Institute , 09

(Mike , Post-Gazette.com , “Sunday Forum: Space Junk,” 2-22 , <http://www.post-gazette.com/pg/09053/950576-109.stm> , 6-24-11 , GJV)

Further, the United States' military-related birds permit the country to conduct "precision" war. For the first time in history, satellites provide the data and the guidance necessary to enable bombs and missiles to actually hit the targets they are fired at. That's a moral plus. If a war must be fought, it should be prosecuted in such a way that military targets are hit and civilians spared to the greatest extent possible. No other country can fight a conventional war as cleanly and humanely as the United States. Satellites make the difference.

Space Exploration Scenario

Space debris threatens robotic and human space missions

National Geographic News, 10

(“Space Junk Cleanup Needed, NASA Experts Warn,” p.1, October 28, NS)

Scientists say the orbital debris, better known as space junk, poses an increasing threat to space activities, including robotic missions and human space flight. "This is a growing environmental problem," said Nicholas Johnson, the chief scientist and program manager for orbital debris at NASA in Houston, Texas. Johnson and his team have devised a computer model capable of simulating past and future amounts of space junk. The model predicts that even without future rocket or satellite launches, the amount of debris in low orbit around Earth will remain steady through 2055, after which it will increase. While current efforts have focused on limiting future space junk, the scientists say removing large pieces of old space junk will soon be necessary. Researchers present an overview of the space junk problem in tomorrow's issue of the journal Science. Fast-moving chunks of space debris zipped uncomfortably close to the International Space Station twice in the past week — cosmic close calls that will likely become more common over the next several years, experts predict. For one thing, after 50 years of spaceflight there is just more junk up there than there used to be, sharing space with vehicles and their human crews. And this debris can snowball — as when satellites collide, spawning thousands of new pieces of orbiting junk.

Space exploration key to avoid human extinction

Foust, aerospace analyst, 6

(Jeff, , editor and publisher of The Space Review, Ph.D in planetary science, The Space Review, “New Strategies for Exploration and Settlement,” http://www.thespacereview.com/article/1860/1)

Spudis took issue with those who he believes have conflated exploration with science. “I think we’ve come in the last century to misunderstand the original meaning of exploration,” he said. Exploration enables science, he said, by making discoveries scientists then attempt to explain, but exploration is more than just science. “Fundamentally exploration is more important than science because it is broader and richer than science,” he said. “It includes both asset protection and wealth generation.”

That approach to exploration, he argued, should be applied to future human space exploration. The “ultimate rationale” for human spaceflight is the survival of the species, he said, noting the record of asteroid and comet impacts and the likelihood that eventually another large body will collide with the Earth, with devastating consequences for life on the planet. “If you want humanity to survive, you’re going to have to create multiple reservoirs of human culture,” he said, “and the way to do that is to expand human civilization off the planet.”

Space Exploration Extensions

Space debris forces emergency avoidance procedures that reduce mission efficiency

Space.com, 2011

(“Space Junk Threat Will Grow for Astronauts and Satellites,” April 6, NS)

Recent space junk scares The recent debris flybys at the space station are just the latest encounters between crewed spacecraft and space junk. Tuesday (April 5), a piece of debris spawned by a 2007 Chinese anti-satellite test threatened the station and its three-person crew. It takes about three days' notice to move the station out of the way in a so-called "debris avoidance maneuver," NASA officials said. This piece wasn't detected in time. So astronauts prepared to take shelter in their attached Soyuz spacecraft, which can serve as a sort of lifeboat. Spaceflyers have resorted to this strategy four or five times in the station's history, Stansbery said. In the end, tracking data indicated that the debris would miss the station, so the astronauts did not have to hunker down in the Soyuz. That debris encounter came four days after another close shave. On Friday (April 1), flight controllers moved the space station clear of a piece of space junk left over from a 2009 collision between two satellites. The orbiting lab has made a dozen such debris avoidance maneuvers since 1999, five of them in the last 2 1/2 years, Stansbery said. A growing problem Pieces of space trash — which may be defunct spacecraft, abandoned launch vehicles, or fragments from satellite collisions — zip around Earth at speeds up to 17,500 mph (28,163 kph). That's so fast that even orbiting paint flecks can damage a spacecraft. And there's a lot of this stuff — much of it larger and far more dangerous than paint flecks. There are more than 20,000 pieces bigger than a softball, for example, and more than 500,000 bigger than a marble, according to NASA officials. Researchers are tracking more than 22,000 chunks of space debris in Earth orbit, but they can't watch it all. The 2007 Chinese anti-satellite test added about 3,000 pieces of space junk to the orbiting population, NASA officials said. The 2009 collision — between a defunct Russian satellite and a U.S. Iridium communications satellite — contributed another 2,000 or so. Sun is waking up These 5,000 new fragments initially started out higher up in Earth orbit than the space station, which flies around the Earth about 220 miles (354 km) up. But they're starting to come closer to the station now, because solar activity is ramping up. The sun is emerging from an extended quiescent period, and increased solar activity is causing Earth's atmosphere to expand, Stansbery said. As a result, the drag on high-altitude space junk is increasing, causing the stuff to spiral lower and lower. "When the solar cycle is ramped up, that's typically when we get a lot of this rain-down from higher altitudes," Stansbery said. Since the peak of solar activity is not expected until 2012 or 2013, astronauts aboard the station could be in for some more close calls in the near future, he added. [Video: The Sun Woke Up on Valentine's Day]

Int’l Space Station Scenario 1/2

Orbital debris puts space missions and the ISS at risk

Leonard, senior space writer, 2007

(David, “China's Anti-Satellite Test: Worrisome Debris Cloud Circles Earth,” Space.com, February 2, NS)

Most prolific and serious fragmentation Johnson said that the debris cloud extends from less than 125 miles (200 kilometers) to more than 2,292 miles (3,850 kilometers), encompassing all of low Earth orbit. The majority of the debris have mean altitudes of 528 miles (850 kilometers) or greater, "which means most will be very long-lived," he said. The number of smaller orbital debris from this breakup is much higher than the 900-plus being tracked. NASA estimates that the number of debris larger than 1 centimeter is greater than 35,000 bits of riff-raff. "Any of these debris has the potential for seriously disrupting or terminating the mission of operational spacecraft in low Earth orbit," Johnson pointed out. "This satellite breakup represents the most prolific and serious fragmentation in the course of 50 years of space operations," he said. Also put in harm's way by the rain of junk from the Chinese ASAT test is the International Space Station (ISS).

ISS is key to future tech breakthroughs.

**Hauser, VP Washington Operations, Research and Analysis and John**

**Research Analyst, at Space Foundation, 9**

(Marty and Mariel, “The International Space Station: Decision 2015”, Space Foundation, <http://www.spacefoundation.org/docs/ISS_Decision_2015.pdf>,)

Benefits to science from basic research advancements are only one aspect of how the ISS can contribute to technological innovation. The space program is one of the most well-known sources of advanced technological research in the country. In the process of researching and designing very complex space systems, advances are made that have benefits outside the space program. The NASA Innovative Partnerships Program helps transition these advances into the private sector, benefiting global competition and the economy. 30 Research associated with the development of the ISS, in particular, has contributed greatly to this phenomenon. For example, technology developed to recycle waste water on the ISS has led to the creation of a filtration system with the ability to purify water from the most challenging water sources. This could have important impacts in remote areas where well water is heavily contaminated by bacteria and it is already being used to purify the water supplies of hospitals in the developing world and dental practices in developed nations. 31 Other technologies derived from work on the ISS include air purifiers, biosensors, and advanced fire alarms. ISS-inspired technology can be found in the most unlikely places: wireless sensors developed for the program can now be found monitoring the structural integrity of three tunnels in the Netherlands. 32 The companies associated with these advances are often partnered with NASA as part of the agency’s Small Business Innovation Research (SBIR) program. The success of small businesses is essential to innovation and growth in the economy. Moreover, although some of these companies are based in states such as Texas, Florida, and California, which are often associated with the space program, others reside in a wide variety of states, including New York, Oregon, Virginia, Montana, Pennsylvania, Arizona, Georgia, Connecticut, Michigan, Colorado, Massachusetts, New Mexico, Maryland, Nevada, and New Hampshire. 33 The ISS has already proven to be an efficient engine for the creation of new, advanced technologies. The longer the program continues, the greater the likelihood that even more technologies will be developed to benefit the United States, and people worldwide.

Int’l Space Station 2/2

Innovation is key to hegemony

Martino, Senior Fellow at the Foreign Policy Research Institute, 7

(Rocco, “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.(FN1) 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.(FN2) 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 even be 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.

<Heg Impact>

Int’l Space Station Extension

Space debris has threatened the ISS 3 times in the past 6 months

Russia & CIS Military Newswire 11

(Russia & CIS Military: “Space debris has threatened ISS three times in past half a year - Russian Space Forces” Lexis 4-16-2011 MLF 6-25-11)

The Russian Space Forces have warned the space mission control three times in the past half a year about the danger of the International Space Station's collision with space debris, Space Forces Commander Maj. Gen. Oleg Ostapenko told journalists. "Three warnings about dangerous proximity between space objects and the International Space Station have been sent to the space mission control [outside Moscow]," Ostapenko said at an expanded meeting of the Space Forces' military council on Saturday. The space control system has monitored the placement of 30 spacecraft into orbit. "More than 20 Russian and foreign spacecraft have been tracked," he said. The system also detected 11 launches of domestic and foreign space rockets. The Russian Space Forces have taken part in the launches of 14 spacecraft, ten of them as part of the federal space program and the other four in the Defense Ministry's interests, from the fall of 2010 to April 2011.

**Economy Scenario**

**Space debris destroys satellites, collapses the economy and causes resource wars**

Moore, research fellow with the Independent Institute , 09

(Mike , Post-Gazette.com , “Sunday Forum: Space Junk,” 2-22 , <http://www.post-gazette.com/pg/09053/950576-109.stm> , 6-24-11 , GJV)

In a time of high tension, someone preemptively smashes spy satellites in low-Earth orbits, creating tens of thousands of metal chunks and shards. Debris-tracking systems are overwhelmed and low-Earth orbits become so cluttered with metal that new satellites cannot be safely launched. Satellites already in orbit die of old age or are killed by debris strikes. The global economy, which is greatly dependent on a variety of assets in space, collapses. The countries of the world head back to a 1950s-style way of life, but there are billions more people on the planet than in the '50s. That's a recipe for malnutrition, starvation and wars for resources.

Economy Scenario Extension

**Satellites are key to globalization**

Moore , research fellow with the Independent Institute , 09

(Mike, Post-Gazette.com , “Sunday Forum: Space Junk,” 2-22 , <http://www.post-gazette.com/pg/09053/950576-109.stm> , 6-24-11 , GJV)

"Orbital space" is a natural resource, as surely as land, air and water. It must be protected because it is home to nearly a thousand satellites put up by many countries -- communications, geo-observation, geopositioning, weather and other types. "Globalization" would not be possible without commercial satellites.

Commercial Satellite Scenario

Satellites are key to global communications

Akir, Director of Distance Learning, Washington State Community College , 04

(Ziad, Online Journal Of Space Education,“Space Security: Possible Issues & Potential Solutions,” <http://spacejournal.ohio.edu/index.html> , 6-25-11 , GJV)

Space communication, particularly satellite communication, is becoming an integral component of our overall global telecommunication infrastructure. Satellites are being used for communication, navigation, remote sensing, imaging, and weather forecasting. Satellites are also providing backup communication capabilities when terrestrial communication is interrupted in cases such as earthquakes or other natural (or unnatural) disasters. The September 11 th events in 2001 demonstrated the value of redundant satellite systems in supporting rescue efforts. 1 Many governments around the world, including the United States, rely on commercial satellite systems for communication, commerce, and defense. Commercial satellite systems include groundbased components such as earth station antennas, data terminals, and mobile terminals; and space-based components include satellites and other systems (e.g. space station and launching vehicles) now essential to global function.

Commercial satellites are vital to upholding U.S. hegemony

Akir, Ohio Univ. Doctoral Student, 3 (Ziad, “Space Security: Possible Issues and Potential Solutions,” accessed 5-7-11, <http://spacejournal.ohio.edu/issue6/pdf/ziad.pdf>)

Commercial space systems are vital in support of military and other governmental operations and activities. Military forces can often operate in environments with little or no existing communication infrastructure. Collecting information in the form of mapping and real-time movements of enemy forces is of crucial importance. Commercial satellite imagery systems are used by governments to achieve their national security interests.15 During the U.S. showdown with Iraq earlier this year, the U.S. government used satellites to track the movement of the Iraqi military as well as keeping track on the where-abouts of the Iraqi weapons.16 Failure in commercial satellite operation may have devastating consequences on the outcome of a military or political conflict.

Commercial Satellite Scenario Extension

Satellites are crucial both state and global, state and telecommunication services.

Jakhu , member of the Editorial Boards of the Annals of Air and Space Law , 07

(Ram , Astropolitics: The International Journal of Space Politics & Policy , pg. 173 – 208 , GJV)

Satellites are the best means for a rapid expansion of telecommunications services nationally and globally. However, the level of that expansion is greatly determined by the availability of the two indispensable tools for satellites, which are orbital positions and radio frequencies. Growing demand for geostationary orbital (GEO) slots and radio frequencies by a rapidly increasing number of commercial satellite operators and expanding dependence on satellites for military purposes give rise to shortage of slots and spectrum to allocate as well as an increase in satellite interference. Concurrently, increasing space activities and anti-satellite (ASAT) tests are generating man-made space pollution, particularly space debris, and consequently are making the use of outer space more expensive and dangerous. The problems shortage of appropriate orbital positions, satellite interference and space debris are serious. Unless resolved in a timely fashion, they would pose significant barriers and dangers to all (civilian, commercial and military) satellites and could result in denial of access to space in practice by all states. This paper first describes the current situation of shortage of GEO positions and increase in satellite interference. Secondly, current international regulatory regime governing the access to and use of these tools has been analyzed with a view to highlight the weaknesses therein. Thirdly, the problem of space debris is discussed with a view to show how difficult it is becoming to carry on space operations and how important and urgent it is to have an appropriate legal regime in place. Finally, a few recommendations are made emphasizing the need for international cooperation in order to strengthen the international regulatory regime so that the required telecommunication services remain readily available to all and outer space remain pollution-free environment to be used for and by all states.

\*\*\*Int’l Science Cooperation Adv.\*\*\*

SETI = International Cooperation

SETI even without results can be valuable for developing the research process and international cooperation

Chandler, science writer, 84

(David L., “Astronomy; Listening To The Stars Gets Respect,” Boston Globe, p. 1, June 25, NS)

The search for signals from intelligent beings in outer space may indeed be a roll of the dice but, after years of struggling to be taken seriously, it has become a respectable scientific endeavor. Its advocates now form an active worldwide network of scientists who have made some significant discoveries and developed techniques that could bear fruit in such diverse fields as telecommunications and theories of star formation. The idea of an organized scientific search for signals from beings on other worlds was first suggested by physicists Philip Morrison and Giuseppe Cocconi in a paper in Nature magazine. It was promptly denounced by many scientists as a science-fiction idea unworthy of serious consideration. Last week, 25 years after the exhortation, the first internationally recognized scientific organization dedicated to that search held its first formal gathering in Boston University's new science center. "This is now mainstream science," astronomer Carl Sagan said in an interview at the meeting, which was sponsored by the International Astronomical Union's commission on the Search for Extraterrestrial Intelligence (SETI). During this meeting, the commission adopted a new name for the field: bioastronomy. According to Cocconi - in a letter read at the meeting by Morrison - "The initial opposition was similar to that met by the pioneers of aviation: Why disturb the Angels?' " The opposition, Cocconi contends, was based on "skepticism, mixed with fear that success would jeopardize something in our lives." But such initial skepticism has slowly given way to the notion that real scientific analysis can be used on even such a speculative and wide-open question, and that the results of such efforts can have great value even if the premise turns out to be wrong. Even Sen. William Proxmire (D-Wis.), a longtime foe of expenditures for what he considers frivolous scientific research, has relented in his opposition to SETI. As recently as two years ago he was attacking the search for extraterrestrials. He even introduced an amendment to NASA's fiscal 1982 budget appropriation, which was passed by Congress, that prohibited the agency from spending any money on anything connected with such a project. Last year, however, after meeting with scientists who believe in the importance of SETI and after seeing a petition supporting the idea signed by 72 distinguished scientists from around the world (including seven Nobel laureates), Proxmire withdrew his opposition. As a result, NASA's SETI program is now funded at a rate of $2 million a year, and is expected to continue at that level for at least a decade. This search, using receivers capable of monitoring millions of channels at once, could begin its test phase as soon as this fall, and will be in full operation in two to three years. Within the scientific community itself, opinion seems to have swung around largely as a result of the careful methodology and useful research that have recently characterized SETI-related work. J. Mayo Greenberg of Huygens Laboratory in the Netherlands said last week that in the past, "I have been a cynic on this subject. I didn't think that SETI was a worthwhile project." But he is now convinced, he said, that even if it is not useful in any immediate sense it can in the long run be highly valuable to do such research. Greenberg's change of heart was partly the result of the formation of the IAU commission that sponsored the BU symposium. "This commission gives such research a viabilityit wouldn't otherwise have had," he said at the conclusion of the meeting. One area of investigation that has shown great progress in the past year, at least in part as a result of the interest of SETI researchers, is the detection of material around nearby stars. This material may be the first stage of the formation of planetary systems. The first such discovery was made last summer by the IRAS satellite, the first orbiting telescope able to search in detail for objects that emit infra- red light. But at last week's meeting, it was reported that analysis of IRAS data has shown that 80 nearby stars - about 25 percent of all those studied - may be surrounded by such clouds of particles. Other researchers reported similar discoveries of disk-shaped clouds, found by Earth-based telescopes. "It's a remarkable finding, a stunning finding," said Sagan, adding that it is likely to be of great significance to astronomers studying the origins of the solar system. Another value of the SETI endeavor was clear from last week's meeting: In the highly specialized world of scientific research it is rare to see such a diverse collection of disciplines represented, all interacting and bringing their differing perspectives to a single issue. As Sagan put it: "Where else would you find molecular biologists, paleontologists, anthropologists, radio astronomers, physicists and peoplefrom a variety of other disciplines meeting like this?" Until recently, SETI had been strongly dominated by the US and the USSR, and it has been the Russians, according to SETI pioneer Frank Drake of Cornell University, who have been responsible for some of the most original and creative ideas in the field. Several Russian scientists had been scheduled to attend this symposium, but cancelled at the last minute, apparently because of strained US-USSR relations. Other nations, however, were represented, including Japan, France, Australia, Canada, Belgium and Sweden. This increasingly international flavor of SETI efforts is another plus cited for such research.

International co-op solves climate change

Climate change requires international cooperative solution

Repower America, No Date (“Solving the Climate Crisis: Around the World”, <http://www.repoweramerica.org/solutions/policies/international-action/>, 6.23.11, SW)

Climate change is a global problem with impacts that are already visible around the world. No single country can solve this crisis by itself. Our task is to work together to confront the reality of climate change and build a global clean energy economy. From China to Indonesia and from the European Union to the Maldives, many nations are already taking important steps to reduce the pollution that causes global warming. Nations are also working toward a global agreement to reduce global warming pollution and adapt to the impacts of climate change. From world leaders to ordinary citizens, everyone can play a role in solving the climate crisis. We encourage you to visit The Climate Project to learn more about our efforts to educate and engage people around the world. Nations Taking Action International efforts to date have been inadequate given the scale and scope of the challenge. Nonetheless, many countries are forging ahead with national policies and investments that limit global warming pollution and promote our transition to clean, renewable energy. What follows are just a few of the actions taking place around the globe.

Lack of international co-op creates an enduring threat to humanity

Davidson, Department of Mechanical Engineering, University of Sierra Leone, 10

Ungandle, UNEP Risoe Centre, “Strategies to mitigate climate change in a sustainable development framework”, <http://uneprisoe.org/copenhagenconf/davidson.htm>, 12-27-10, 6.23.11, SW)

The consensus among scientists world-wide that global climate instability may occur if the current rate of greenhouse gas (GHG) emissions is not reduced is strong enough for taken national and international actions. This view has been confirmed by United Nations Intergovernmental Panel on Climate Change (IPCC,1992), and they have called for rapid and immediate actions. Continued GHG emissions on its current accumulated stock so increasing the concentration will result in warming of the earth leading to unprecedented rise in global temperatures. Despite the extent of this warming, its local, regional and global impacts are uncertain, the rapid actions called for by IPCC must be adhered to. These uncertainties which are mainly due to limited knowledge of the earth's absorptive capacity for GHG and the extent of possible feedbacks to the atmosphere are not enough to support in-action. Likely impacts of global warming such as sea level rise, changes in storm activity, in vegetation distribution and in agronomic conditions can be dangerous to human existence and trans-boundary in nature. The lifetime of GHG is very long, 50-200 years, hence this problem can persist for very long periods. All the more reason for actions to stabilize GHG emissions.

AT: No Warming

**There is a scientific consensus that anthropogenic global warming is occurring**

Oreskes, Professor of History and Science Studies at the University of California, San Diego, Adjunct Professor of Geosciences at the Scripps Institution of Oceanography,4

(Naomi,“The Scientific Consensus on Climate Change”, Dec 3, <http://www.sciencemag.org/cgi/content/full/306/5702/1686>

Policy-makers and the media, particularly in the United States, frequently assert that climate science is highly uncertain. Some have used this as an argument against adopting strong measures to reduce greenhouse gas emissions. For example, while discussing a major U.S. Environmental Protection Agency report on the risks of climate change, then-EPA administrator Christine Whitman argued, "As [the report] went through review, there was less consensus on the science and conclusions on climate change" ([1](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref1)). Some corporations whose revenues might be adversely affected by controls on carbon dioxide emissions have also alleged major uncertainties in the science ([2](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref2)). Such statements suggest that there might be substantive disagreement in the scientific community about the reality of anthropogenic climate change. This is not the case. The scientific consensus is clearly expressed in the reports of the Intergovernmental Panel on Climate Change (IPCC). Created in 1988 by the World Meteorological Organization and the United Nations Environmental Programme, IPCC's purpose is to evaluate the state of climate science as a basis for informed policy action, primarily on the basis of peer-reviewed and published scientific literature ([3](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref3)). In its most recent assessment, IPCC states unequivocally that the consensus of scientific opinion is that Earth's climate is being affected by human activities: "Human activities ... are modifying the concentration of atmospheric constituents ... that absorb or scatter radiant energy. ... [M]ost of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations" [p. 21 in ([4](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref4))].IPCC is not alone in its conclusions. In recent years, all major scientific bodies in the United States whose members' expertise bears directly on the matter have issued similar statements. For example, the National Academy of Sciences report, Climate Change Science: An Analysis of Some Key Questions, begins: "Greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise" [p. 1 in ([5](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref5))]. The report explicitly asks whether the IPCC assessment is a fair summary of professional scientific thinking, and answers yes: "The IPCC's conclusion that most of the observed warming of the last 50 years is likely to have been due to the increase in greenhouse gas concentrations accurately reflects the current thinking of the scientific community on this issue" [p. 3 in ([5](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref5))]. Others agree. The American Meteorological Society ([6](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref6)), the American Geophysical Union ([7](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref7)), and the American Association for the Advancement of Science (AAAS) all have issued statements in recent years concluding that the evidence for human modification of climate is compelling ([8](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref8)). The drafting of such reports and statements involves many opportunities for comment, criticism, and revision, and it is not likely that they would diverge greatly from the opinions of the societies' members. Nevertheless, they might downplay legitimate dissenting opinions. That hypothesis was tested by analyzing 928 abstracts, published in refereed scientific journals between 1993 and 2003, and listed in the ISI database with the keywords "climate change" ([9](http://www.sciencemag.org/cgi/content/full/306/5702/1686#ref9)). The 928 papers were divided into six categories: explicit endorsement of the consensus position, evaluation of impacts, mitigation proposals, methods, paleoclimate analysis, and rejection of the consensus position. Of all the papers, 75% fell into the first three categories, either explicitly or implicitly accepting the consensus view; 25% dealt with methods or paleoclimate, taking no position on current anthropogenic climate change. Remarkably, none of the papers disagreed with the consensus position. Admittedly, authors evaluating impacts, developing methods, or studying paleoclimatic change might believe that current climate change is natural. However, none of these papers argued that point. This analysis shows that scientists publishing in the peer-reviewed literature agree with IPCC, the National Academy of Sciences, and the public statements of their professional societies. Politicians, economists, journalists, and others may have the impression of confusion, disagreement, or discord among climate scientists, but that impression is incorrect.The question of what to do about climate change is also still open. But there is a scientific consensus on the reality ofanthropogenic climate change. Climate scientists have repeatedly tried to make this clear. It is time for the rest of us to listen.

AT: No Warming

Multiple studies prove warming is anthropogenic – no other explanation is possible

Scott, Hadley Center for Climate Prediction and Research, 3

(Peter, “Attribution of temperature changes to anthropogenic and natural causes”, July 16, http://www.geog.ox.ac.uk/~mnew/teaching/Online\_Articles/stott\_regional\_attribution\_GRL\_2003.pdf)

An increasing body of evidence indicates that global warming that has been observed over the course of the last century cannot be explained by natural externally forced or internal variability [Mitchell et al., 2001]. A number of recent studies [eg., Stott et al., 2001; Tett et al., 2002] have used optimal detection [Hasselmann, 1997], a form of linear regression [Allen and Tett, 1999], to estimate the contributions, with their uncertainties, of anthropogenic and natural forcings to recent temperature changes. Optimal detection studies consistently show that anthropogenic forcings were the dominant factor controlling global warming in the latter half of the 20th century, leading the IPCC to conclude in the Third Assessment Report that ‘‘most of the warming observed over the last 50 years is attributable to human activities’’. [3] Most detection studies investigating atmospheric temperature changes have considered global scale patterns of change. [Zwiers and Zhang, 2003] showed that the combined effects of greenhouse gases and sulfate aerosols may be detected on sub-global scales, and showed a detectable anthropogenic influence on warming in Eurasia and North America.

\*\*\*\*Additional Advantages\*\*\*\*

Competitiveness Advantage 1/2

SETI radio astronomy key to US competitiveness

National Radio Astronomy Observatory 6

(Staff produced report, Radio Astronomy: Contributing to American Competitiveness, October, http://www.nrao.edu/news/Technology\_doc\_final.pdf

Radio astronomy is an exemplary national resource that increases American competitiveness in many

ways. It contributes uniquely and significantly to our understanding of the universe, and has been a

catalyst for enhanced scientific training and basic research in many fields. Extreme distances, weak

signals, and vast amounts of astronomical data require instrumentation and processing that pushes the

state of the art to its limits. Radio telescopes, facilities, and instruments are developed on a scale that

requires collaborative effort and greater funding than a single organization can provide. These technical innovations lead to private sector investment in research and development that translates fundamental discoveries into the production of useful and marketable technologies, processes, and techniques that effect our lives each day.

Technical innovations developed or enhanced for radio astronomy are found in communication antennas, transistor design, cryogenic coolers, medical and scientific imaging, time and frequency standards, atomic clocks and GPS navigation, precision spacecraft navigation, location of cell phone 911 calls, laser rangefinders, and quasi-optical applications. Radio astronomy tracks solar flares that can cause disruption of earth-based communications, damage to orbiting satellites, and destructive surges on power grids. The vast amount of computing capacity required for Searches for Extraterrestrial Intelligence radio signal processing led to a unique grid computing concept that has been expanded to many applications.

Competiveness key to US economy

Council on Competitiveness 8 [“Rebound: Three Essentials to Get the Economy Back on Track,” November, http://www.compete.org/images/uploads/File/PDF%20Files/COC\_Rebound.pdf]

The balance sheets of many companies remain healthy, but business leaders are reluctant to invest in this uncertain, volatile environment. The net result is that tens of billions of dollars in planned capital investment are sitting idle. Enabling companies to expense immediately the full cost of new capital equipment and facilities investments could unlock corporate balance sheets, stimulating jobs and growth. For many companies, the retirement of older equipment and subsequent investment in more efficient machinery, vehicles and equipment will generate tremendous gains in energy efficiency and cost savings as well. The result is an incentive that expands capital investment while driving a higher level of energy productivity. America needs Next Generation Infrastructure to sustain its economic leadership in the global economy. The nation can fund those projects through a unique savings bond program called CompeteBond—tax-exempt, federally-guaranteed bonds available to any American who wants to contribute to our nation’s economic revitalization while raising the personal saving rate and reducing our dependence of foreign borrowing. The resulting capital would be transparently reinvested into projects that, for example, expand broadband access, provide greener public transportation systems and contribute to the development of a national electric transmission superhighway. These investments will result in greater energy and homeland security and lower carbon emissions—and they will produce hundreds of thousands of high-paying American jobs.

Competitiveness Advantage 2/2

US is the economic linchpin of the world

AP 5/20 (AP, Associated press, 2011, p. google news, http://www.google.com/hostednews/ap /article, OST)

It would be a "moral disaster" if the U.S. were to default on its debts and was unable to pay its obligations, PMorgan Chase & Co. CEO Jamie Dimon said at an appearance in Colorado Thursday evening. The U.S. is the financial linchpin of the world, and the economic effects of the U.S. defaulting could be "potentially catastrophic," he said at a dinner for the University of Colorado Denver Business School. "It will dwarf Lehman," Dimon said, referring to the 2008 collapse of the investment bank Lehman Brothers, which contributed to the beginning of a global financial crisis.

Extinction

Bearden 2k (Lieutenant Colonel in the U.S. Army, www.cheniere.org/techpapers/Unnecessary%20Energy%20Crisis.doc) ET

Bluntly, we foresee these factors - and others { } not covered - converging to a catastrophic collapse of the world economy in about eight years. As the collapse of the Western economies nears, one may expect catastrophic stress on the 160 developing nations as the developed nations are forced to dramatically curtail orders. International Strategic Threat Aspects History bears out that desperate nations take desperate actions. Prior to the final economic collapse, the stress on nations will have increased the intensity and number of their conflicts, to the point where the arsenals of weapons of mass destruction (WMD) now possessed by some 25 nations, are almost certain to be released. As an example, suppose a starving North Korea launches nuclear weapons upon Japan and South Korea, including U.S. forces there, in a spasmodic suicidal response. Or suppose a desperate China - whose long range nuclear missiles can reach the United States - attacks Taiwan. In addition to immediate responses, the mutual treaties involved in such scenarios will quickly draw other nations into the conflict, escalating it significantly. Strategic nuclear studies have shown for decades that, under such extreme stress conditions, once a few nukes are launched, adversaries and potential adversaries are then compelled to launch on perception of preparations by one's adversary. The real legacy of the MAD concept is his side of the MAD coin that is almost never discussed. Without effective defense, the only chance a nation has to survive at all, is to launch immediate full-bore pre-emptive strikes and try to take out its perceived foes as rapidly and massively as possible. As the studies showed, rapid escalation to full WMD exchange occurs, with a great percent of the WMD arsenals being unleashed . The resulting great Armageddon will destroy civilization as we know it, and perhaps most of the biosphere, at least for many decades.

Competitiveness – Adv Uniqueness

US Competitiveness is on the brink – we’ve dropped in global rankings, but now is key to promote economic growth.

Allen, CNBC Senior News Editor, 10 [Patrick, “US Falls Down Competitiveness League Table,” CNBC, 9/9/10)

The United States fell two places to fourth position behind Switzerland, Sweden and Singapore in this year's World Economic Forum's "Global Competitiveness Report." The US fell further in the competitiveness table, after losing the top spot last year. Having been knocked off top spot by the Swiss last year, a number of factors are making the US less competitive, according to the WEF. "In addition to the macroeconomic imbalances that have been building up over time, there has been a weakening of the United States' public and private institutions, as well as lingering concerns about the state of its financial markets," the report said. All the uncertainty is making life very difficult for governments and central banks, Klaus Schwab, the founder of the World Economic Forum which hosts its annual meeting in Davos every January, said. "Policy-makers are struggling with ways of managing the present economic challenges while preparing their economies to perform well in a future economic landscape characterized by uncertainty and shifting balances," Schwab said. "In such a global economic environment, it is more important than ever for countries to put into place the fundamentals underpinning economic growth and development," he said. Following the election of David Cameron's coalition government, the UK has gained one place to 12th and the major emerging markets continue to rise up the rankings. "The People's Republic of China at 27th continues to lead the way among large developing economies, improving by two more places this year, and solidifying its place among the top 30," the report said. Among the three other BRIC economies, Brazil (58th), India (51st) and Russia (63rd) remain stable. Politicians must not lose sight of competitiveness following three years of crisis, Xavier Sala-i-Martin, a professor of economics at Columbia University and a co-author of the report, warned. "For economies to remain competitive, they must ensure that they have in place those factors driving the productivity enhancements on which their present and future prosperity is built," Sala-i-Martin wrote. "A competitiveness-supporting economic environment can help national economies to weather business cycle downturns and ensure that the mechanisms enabling solid economic performance going into the future are in place," he said.

Competitiveness Key to Heg

Competitiveness key to heg

Khalilzad, director of the Strategy and Doctrine Program @ RAND, 95

(Zalmay, "Losing the Moment? The United States and the World After the Cold War," Washington Quarterly, Spring)

The United States is unlikely to preserve its military and technological dominance if the U.S. economy declines seriously. In such an environment, the domestic economic and political base for global leadership would diminish and the United States would probably incrementally withdraw from the world, become inward-looking, and abandon more and more of its external interests. As the United States weakened, others would try to fill the Vacuum. To sustain and improve its economic strength, the United States must maintain its technological lead in the economic realm. Its success will depend on the choices it makes. In the past, developments such as the agricultural and industrial revolutions produced fundamental changes positively affecting the relative position of those who were able to take advantage of them and negatively affecting those who did not. Some argue that the world may be at the beginning of another such transformation, which will shift the sources of wealth and the relative position of classes and nations. If the United States fails to recognize the change and adapt its institutions, its relative position will necessarily worsen. To remain the preponderant world power, U.S. economic strength must be enhanced by further improvements in productivity, thus increasing real per capita income; by strengthening education and training; and by generating and using superior science and technology.

Competitiveness key to heg

Galama, management scientist and Hosel, Senior Economist at RAND, 8

(Titus, James, “U.S. Competitiveness in Science and Technology “,RAND Corporation monograph series http://www.rand.org/pubs/monographs/2008/RAND\_MG674.pdf)

On October 20, 2005, House Science Committee Chairman Sherwood Boehlert took to the podium before his committee colleagues and made a dramatic pronouncement: “Complacency will kill us. If the United States rests on its withering laurels in this competitive world, we will witness the slow erosion of our pre-eminence, our security, and our standard of living. It’s a sobering message” (Boehlert, 2005). Boehlert was opening a hearing of the House Science Committee, titled “Science, Technology, and Global Economic Competitiveness.” He drew his grim warning from a report by the National Academy of Sciences (NAS) being unveiled that day titled Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Future (NAS, 2006). his document came to be the most well known of a wave of reports that had preceded—and which followed—it, all cautioning that the United States is at grave risk of being unable to compete in the 21stcentury global marketplace because of its steadily declining leadership in science and technology (S&T). Addressing their opening letter “To Leaders Who Care About America’s Future,” the authors of a 2005 Business Roundtable document warn: Today . . . [o]ne of the pillars of American economic prosperity— our scientiﬁc and technological superiority—is beginning to atrophy even as other nations are developing their own human capital If we wait for a dramatic event—a 21st-century version of Sputnik—it will be too late. here may be no attack, no moment of epiphany, no catastrophe that will suddenly demonstrate the threat. Rather, there will be a slow withering, a gradual decline, a widening gap between a complacent America and countries with the drive, commitment and vision to take our place.” (Business Roundtable, 2005) Other reports bear such disquieting titles as Tough Choices or Tough Times (he New Commission on the Skills of the American Workforce, 2007), he Looming Workforce Crisis (National Association of Manufacturers, 2005), he Knowledge Economy: Is the United States Losing Its Competitive Edge? (Task Force on the Future of American Innovation, 2005), and Oﬀshore Outsourcing and America’s Competitive Edge: Losing Out in the High Technology R&D and Services Sector (Oﬃce of Senator Joseph I. Liebermann, 2004). Coming from multiple corners—the private sector, academia, government, and policy think tanks—they provide an abundance of data all pointing to the same conclusion: the eﬀects of globalization, 1 combined with an erosion of the nation’s domestic S&T enterprise, may spell serious trouble for the United States.

Competitiveness – AT: Alternate internal links

Radio astronomy funding is the best internal link to competitiveness

National Radio Astronomy Observatory 6

(Staff produced report, Radio Astronomy: Contributing to American Competitiveness, October, http://www.nrao.edu/news/Technology\_doc\_final.pdf

It is clear that radio astronomy is a valuable national resource that not only increases our fundamental knowledge of the universe, but also contributes significantly to American competitiveness. Radio astronomy programs are unique, and are on a scale that requires collaborative effort and greater funding than a single organization can provide. Only a few endeavors lead to a wide variety of useful and marketable technologies, processes, and techniques, and at the same time, stir the imagination of young and old minds alike. Radio astronomy is one of them.

Tech Innovation Advantage

**SETI leads to advanced technology spinoffs & innovation**

National Radio Astronomy Observatory 6

(Staff produced report, Radio Astronomy: Contributing to American Competitiveness, October, http://www.nrao.edu/news/Technology\_doc\_final.pdf

The contribution of radio astronomy to other applications has been more than the basic technology transfer from one discipline to another. In addition to the greater understanding of the physical processes in the universe gleaned from radio astronomy that has been a catalyst for basic and applied research in other fields, the technical requirements driven by the construction of radio astronomy instruments has both driven new technological advances and pushed existing technologies. Sometimes, requirements of radio astronomy for technology that did not exist have been the impetus for basic and applied engineering development. In other cases, new technology developed for other applications had the potential to support radio astronomy, but did not meet the stringent requirements demanded by radio astronomy, and thus the existing technologies were pushed to greater levels of performance. Radio astronomy development projects are usually quite large in scope, and large sources of funds are necessary to support the technical developments that might not have been started without radio astronomy financial support.

The US must invest in technology to maintain US hegemony

Rosenberg, staff writer in technology and policy, 11

(Jeff, June 13, “The US must invest more in science and technology,” MN Publius, http://mnpublius.com/post/6491523747/the-us-must-invest-more-in-science-and-technology) KA

Today, the United States’ supremacy when it comes to science and technology is unquestionable. As the importance of technology in the global economy grows and grows, it is crucial that we maintain that edge. To that end, here’s some great tech news: Researchers at I.B.M. said Thursday that they’ve managed to create high-speed circuits from graphene, a nano-material that is almost transparent and is capable of coping with higher temperatures than the material in the current generation of silicon chips. But I couldn’t help but notice this paragraph further into the article: The European Union, South Korea and Singapore all have major research efforts into graphene underway, he reports. The efforts underway in the United States are more modest. Part of I.B.M.’s research was funded by the Pentagon’s Defense Advanced Research Projects Agency. We’re making advances in graphene research. But in the face of international competition, can we stay on top, even if we underfund our efforts? This isn’t just about Graphene. Government support for scientific research has fallen. We have failed to offer serious support for biotech research that could revolutionize medicine. And we’re leaving investment in broadband infrastructure up to the private sector, for whom scarcity is a business model. We’re technology leaders right now. But given our dwindling investments in technology research and infrastructure, how long can we maintain that? It’s time we got serious about fields that are going to form the basis of our economy for decades.

<Heg Impact>

Tech Adv. Extensions

**SETI spurs tech spinoffs**

**Shostak, Senior Astronomer at the SETI Institute, 10**

(Seth, [American](http://en.wikipedia.org/wiki/United_States) astronomer, earned his [physics](http://en.wikipedia.org/wiki/Physics) degree from [Princeton University](http://en.wikipedia.org/wiki/Princeton_University) and a [Ph.D.](http://en.wikipedia.org/wiki/Ph.D.) in [astronomy](http://en.wikipedia.org/wiki/Astronomy) from the California Institute of Technology, 2004 winner of the [Klumpke-Roberts Award](http://en.wikipedia.org/wiki/Klumpke-Roberts_Award) awarded by the [Astronomical Society of the Pacific](http://en.wikipedia.org/wiki/Astronomical_Society_of_the_Pacific) in recognition of his outstanding contributions to the public understanding and appreciation of astronomy, November 2010, “Closing in on E.T.,” Ebsco,) KA

Our optimism stems from the fact that SETI experiments are becoming exponentially faster, thanks to better technology. Modern radio searches rely on large dollops of digital number crunching: after all, the receivers must paw through billions of narrowband channels, scanning each one for excess signal power that easily stands above the galaxy’s broadband radio noise. If experimenters can get their hands on faster computers, they can increase the number of channels observed at a single go, thereby shortening the time needed to check out a stellar target. Well, digital electronics double in speed (at any given price point) each 18 months, a fact well known to readers who find themselves trading in perfectly good laptops every few years. If you check out the pace of SETI experiments in the last half-century, you’ll realize that they’ve kept up with this frenetic technological gallop. While SETI has examined fewer than 1,000 stars for faint radio signals, that number should grow to a million in the next 25 years. A million could be enough to garner success, if our galaxy’s tally of transmitting civilizations is 10,000 or more. For this reason, SETI scientists grow misty-eyed about new instruments such as the Allen Telescope Array (ATA), which can take advantage of this crescendo of computer power. The SETI Institute and the University of California, Berkeley’s Radio Astronomy Lab are collaborating to build the ATA — a new kind of array that can greatly speed the search for alien signals.

SETI has developed spinoff technology such as multichannel spectrum analyzers may have other applications in industry and medicine

Chandler, science writer, 1984

(David L., “ASTRONOMY; LISTENING TO THE STARS GETS RESPECT,” Boston Globe, p. 1, June 25, NS)

For one thing, the fundamental problem faced in SETI attempts is trying to extract faint, unknown signals from a barrage of background noise. SETI scientists, including Paul Horowitz of Harvard, creator of Project Sentinel, have devised multichannel spectrum analyzers to deal with that problem. Such devices are already beginning to find uses in radio communications here on Earth. And some companies are beginning to apply the same methods to industrial test equipment. Bernard Oliver, director of the NASA's SETI project and former vice president of Hewlett-Packard Corp., predicts that SETI-derived computerized signal processors could be applied even to such things as interpreting electro-encephalograms that are used to detect brain disease. "It may allow people to detect patterns in those messy brain-wave scans," Oliver says.

SETI research results in spin-off – technology in processing, collecting, and analyzing data, radio telescopes, signal process architecture

Meech and Ivine, associate astronomer at the UH Institute for Astronomy; professor in astronomy and solar system physics, 9

(K.J. and W.M., *Bioastronomy 2007: Molecules, Microbes and Extraterrestrial Life ASP Conference Series*, Vol. 420, proceedings of a workshop held 16-20 July 2007 in San Juan, Puerto Rico. Edited by Karen J. Meech, Jaqueline V. Keane, Michael J. Mumma, Janet L. Siefert, and Dan J. Werthimer. San Francisco: Astronomical Society of the Pacific, 2009., p.3) KA

1. The SETl@home Project at UC Berkeley SETT@home is a distributed computing project harnessing the power from mil­lions of volunteer computers around the world (Anderson 2002). Data collected at the Arecibo radio telescope via commensal observations are filtered and cal­ibrated using real-time signal processing hardware, and selectable channels arc recorded to disk. These disks are shipped to UC Berkeley, where the data arc distributed over the Internet in the form of "work units" to volunteers who use spare cycles on their computer to search for patterns in the recorded noise. Processed work units are returned to UC Berkeley and stored in databases for further statistical analysis in the search for signals indicative of extra-terrestrial intelligence. While the direct product of this research has been a series of null results, the technology developed for this project is widely applicable, and has spun off several derivative projects based around the real-time signal processing archi­tecture used at the telescope (and other radio telescopes worldwide), the dis­tributed computing architecture used for off-line data processing, and the expensive archives of survey data collected for analysis. We illustrate the foundations of this research in the SETI@home project, and present several applications of the technology SETI@home has developed and generalized for widespread use.

Astrobiology Advantage 1/

Astrobiology research declining now

DeVore, Deputy CEO of SETI, 6

**(Edna, “Astrobiology research threatened at nasa”, March 30, SETI Institute,** <http://www.seti.org/page.aspx?pid=777>**) PG**

**Science is suffering,** and scientists, studentsand the public are not going to quietly accept the cancellation of nearly completed missions. Nor will they tolerate the starvation of fundamental research programs. In Astronomy and Astrophysics Division, the Stratospheric Observatory For Infrared Astronomy (SOFIA) and Dawn Missions were originally scheduled for cancellation in the ’07 budget. The Space Interferometry Mission is delayed, and Terrestrial Planet Finder has been pushed beyond the future budget horizon, the equivalent of cancellation. Both SOFIA and Dawn have now been reviewed. This week Administrator Griffin [reinstated Dawn](http://www.spaceref.com/news/viewpr.html?pid=19372), overturning Mary Cleave’s abrupt cancellation of the mission. The results of the SOFIA review have not yet been announced. [SOFIA is virtually complete](http://http://www.space.com/searchforlife/seti_sofia_devore_060209.html), and it makes no sense to cancel this mission as several members of the House of Representatives—including Rep. Ralph Hall (R, Texas), Rep. Mike Honda (D, CA)--both pointed out to NASA administrators in Congressional hearings on the NASA budget. **Astrobiology is the core science of space exploration, and it’s proposed for a 50% cut. The 2005 budget was approximately $65 million. For 2006 and forward, Cleave cut the program to $32.5 million.**

Allen Telescope Array crucial to astrobiology research

Welch, former director of the Radio Astronomy Lab at U.C. Berkeley, 10

(William J., “The allen telescope array as a tool for seti and astrobiology research”, Astrobiology Science Conference 2010, http://www.lpi.usra.edu/meetings/abscicon2010/pdf/5437.pdf)

The ATA [1] is a multielement array of radio telescope antennas which is especially well suited for surveys such as for SETI and for important biomolecuules. The individual antennas are small, which provides a very large instantaneous field of view. It operates over a very large bandwidth, covering most of the transparent window in the earth’s atmosphere at radio wavelengths. As an extended array, it is effective in rejecting man-made interference. Multiple beams within the field of the individual antennas can be formed, enabling searches toward multiple target stars. The large number of antennas provides high sensitivity for the search. It is designed to operate in a commensal mode so that SETI searaches can be conducted at the same time as other astronomy searches. This makes essentially full time available for the SETI searches.

Astrobiology key to US science leadership

Manichelli, SETI Institute PI, 6

**(Rocco, Space.com, March 6, “Destroying Astrobiology would be a disaster”,** <http://www.space.com/2135-commentary-destroying-astrobiology-disaster.html>**) PG**

**Astrobiology sets an agenda for inspiring the next generation of planetary explorers** and stewards to sustain the NASA vision and mission. **Astrobiology has generated orders of magnitude more results, visibility, and above all, more sources of** [**education**](http://www.space.com/2135-commentary-destroying-astrobiology-disaster.html) **to the young than any space science discipline ever before.**  **If** the **cuts come to pass, it will be devastating.  Consequences will include: The loss of** [**cutting-edge**](http://www.space.com/2135-commentary-destroying-astrobiology-disaster.html) **science and the loss of the US leadership while, in comparison**, Europe and other countries are increasing their research grants in related domains and broadening their programs. **The loss of hundreds of scientists who will be left without funding, the same scientists who are currently world-leaders in their research areas and are making headlines worldwide today**, as they have been at an increasing pace over the past 10 years because of the quality and results of their research. **The loss of an entire generation of young researchers who just defended their Ph.D. thesis in astrobiology-related subjects and will have nowhere to go.  The US has invested millions of dollars in the formation of this young and strong elite to ensure the future of the US leadership in space sciences.** This will be a total waste. **Everyone has a stake in astrobiology.  Destroying astrobiology will be a national disaster to an extent that the United States is unlikely to recover from it.  It will have enduring consequences on the country's science leadership in the world.** The astrobiology budget cuts will destroy the foundation of this leadership by annihilating an entire generation of researchers, their research, and the new generation they were forming.

Public Engagement Advantage

SETI encourages public engagement in science

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 28, 21 July 2011) SW

Advanced preparation should include educational programs for preparing people for the possibility of contact. SETI provides a wonderful “hook” for engaging people in science. Properly designed educational programs can enhance people’s understanding of astronomy and life sciences, as well as acquaint them with SETI and its possible aftermath. The SETI Institute’s “Social Implications” report (Billingham et al., 1999) devoted close attention to this and looked to broad partnerships including planetaria and libraries as well as schools, colleges, and universities. This report also described how SETI scientists could work with the news and entertainment media to educate people and help shape public opinion. A multimedia approach can help, for example, by using the visual arts to make the extraterrestrial presence real but in nonthreatening ways. Several education efforts are already underway. The SETI Institute’s “Life in the Universe” curriculum is noteworthy in part because it is under translation into different languages to make it more accessible to the world’s population. The SETI Australia Centre also has a large educational component. Relevant also are the websites and outreach programs maintained by the NASA-Ames Astrobiology Institute. Specific target populations include the media, opinion leaders, and children. The media must be highly informed so that it can provide high-quality coverage even in the event of rapidly unfolding developments. Politicians, scholars, business magnates, military officers, and other opinion leaders must be informed, because they will help shape the reactions of the many people who look to them for guidance. Children are important because it is they who will carry on the search, and their generation may be the first to experience the full impact of contact. As a useful spin-off, educational efforts aimed at children will help them separate science and fiction, and nudge them toward careers in science and technology. In addition to reaching individuals, we need to reach organizations and institutions that will have much to do with managing contact and its aftermath. These include intelligence-gathering organizations, legislative and regulatory bodies, the military, the media, and professional organizations of all sorts.

Science engagement key to democracy

Kuhn, creator of Closer to the Truth: Science, Meaning, and The Future, 3

(Robert, American Scientist, “Science as a Democratizer”, <http://www.americanscientist.org/issues/pub/science-as-democratizer/1>) PG

I'll start with an observation. In general**, countries that have stronger sciences have stronger democracies**. And in countries where science has little strength and scientific ways of thinking have no apparent impact, governments tend to range from undemocratic to totalitarian. This is quite obviously correlation, not cause—and even if cause, the direction of the causation arrow is unclear. **A democratic country might foster science, perhaps as a second-order effect of the prosperity and high literacy conventionally coincident with democracy, just as logically as a scientific country might foster democrac**y. How might **science engender democracy**? I'd like to suggest two mechanisms: first, **by changing the way people think**; **second, by altering the interaction among those who make up the community. The more scientifically literate people become, the more they will expect, even demand to participate in the political process, and the more effective they will be at it.** Such social evolution may be slow, nonlinear and chaotic, and periodically may even reverse course, but it is probably also inexorable, as the recent history of the former Soviet Union and other Communist countries in Europe shows.

Democracy solves nuclear and biological warfare, genocide, and environmental destruction

Diamond, Hoover Institution, Stanford University 95

(Larry, December, Promoting Democracy In The 1990s, 1p.http://www.carnegie.org//sub/pubs/deadly/diam\_rpt.html )

Nuclear, chemical and biological weapons continue to proliferate. The very source of life on Earth, the global ecosystem, appears increasingly endangered. Most of these new and unconventional threats to security are associated with or aggravated by the weakness or absence of democracy, with its provisions for legality, accountability, popular sovereignty and openness. The experience of this century offers important lessons. Countries that govern themselves in a truly democratic fashion do not go to war with one another. They do not aggress against their neighbors to aggrandize themselves or glorify their leaders. Democratic governments do not ethnically "cleanse" their own populations, and they are much less likely to face ethnic insurgency. Democracies do not sponsor terrorism against one another. They do not build weapons of mass destruction to use on or to threaten one another. Democratic countries form more reliable, open, and enduring trading partnerships. In the long run they offer better and more stable climates for investment. They are more environmentally responsible because they must answer to their own citizens, who organize to protest the destruction of their environments. They are better bets to honor international treaties since they value legal obligations and because their openness makes it much more difficult to breach agreements in secret. Precisely because, within their own borders, they respect competition, civil liberties, property rights, and the rule of law, democracies are the only reliable foundation on which a new world order of international security and prosperity can be built.

Public Engagement Ext. – SETI Key

SETI Institute = education

Harison, Phd, 97 (Albert A., After Contact, Google Books, 1997) PG

We might expect that a scientiﬁcally literate public that understands SETI and is resistant to rumours, pseudoscience and alternative history will be better prepared for the discovery than a poorly informed and gullible public. As Carol Oliver [18] points out, from its inception, SETI has **maintained strong programmes of education and outreach.** **The SETI Institute takes a multi-pronged approach including a website, publications, teacher education materials and public appearances in person and in the media.** NASA Ames Research Center is among the organizations that sponsors education and outreach efforts in the broader ﬁeld of astrobiology. SETI@Home captured public interest and informed thousands of people who volunteered their home computers to help analyse mounds of raw data.

SETI is key to research projects for students

Cowen, award for sustained achievement in space journalism, 90

(Robert C., Christian Science Monitor, November 28, “Low Cost SETI Program Promises Awesome Discoveries”, p13, Lexis)

Considering other demands on the national budget, is SETI really just a trivial hobby for deluded romantics? It's hard to believe it is, considering its scientific and popular interest. The International Astronomical Union considers SETI an important aspect of modern astronomy. Several other nations have SETI programs under way. As for public interest, **the Planetary Society has raised enough private money to maintain the largest SETI program now running**. There are two major reasons for supporting this research. First, **it is an effort to develop important scientific knowledge**. People have wondered for millennia if we are alone in the universe. Now, for the first time, the search for an answer can go beyond philosophical speculation and religious dogma. We are gaining the means to pursue the search scientifically. And radio technology is one of the best tools available. Second, SETI research encourages development of sophisticated means for detecting and analyzing microwave emissions. The new technology can be useful for many purposes. **SETI also provides interesting research projects for science and engineering students.**

Public Engagement Ext.

Public involvement in space development is good—three key reasons

Dickson, Director of the Science and Development Network, 4

(David, SciDev, “The need to increase public engagement in science”, November 30, <http://www.scidev.net/en/editorials/the-need-to-increase-public-engagement-in-science.html>) PG

**There are three main arguments that favour an increased democratic engagement with the practice of science.** The first, as indicated above, is that much of **science is directly financed from the public purse.** For that reason alone, scientists who benefit have a direct responsibility to ensure that their work aligns with the priorities of the public that supports them. **This responsibility only increases in a political era that requires greater transparency and accountability** from all those who receive public funding. A second reason is more explicitly political. **The alternative to direct public engagement in setting the research agenda is to allow this to be done by the requirements of the market-place.** This has certainly been the dominant philosophy in the way that science has been funded in most developed countries over the past 20 years. During this time, both university laboratories and government research institutes have been increasingly required to mould their research agendas to the demands of market forces, in the name of promoting rapid economic growth. **The direct outcome of investment in market-oriented research has been the explosive growth of the so-called knowledge economy.** And this in turn has certainly given rise to technologies that have benefited rich and poor alike. Those who criticise corporate control of the research agenda need to take account of the way that the mobile telephone — perhaps one of the most iconic outcomes of this trend — is now almost as widely used in developing as in developed countries. **The third factor encouraging greater public engagement in science is perhaps the most pressing. Without such engagement, the current widespread distrust in science is only likely to increase. And this in turn is likely to translate into a lack of the political support that is so vital if the full potential offered by science for achieving both social and economic progress is to be achieved.**

Public involvement of space fosters the crucial critical appreciation of science

Dickson, Director of the Science and Development Network, 4

(David, SciDev, “The need to increase public engagement in science”, November 30, <http://www.scidev.net/en/editorials/the-need-to-increase-public-engagement-in-science.html>) PG

Of course, the statement that "science, like art, is not a democratic activity" has an important element of truth to it. **Science** does not evolve through either consensus or majority voting. Rather, it **requires a judicious combination of experiment and validation, both of which involve the exercise of specialist skills. A prime example of this is the peer review process by which research results are judged appropriate for publication**. Those who claim that all scientists should be allowed to present their work directly to the public — and that peer review acts as a form of censorship that eliminates uncomfortable conclusions — frequently ignore its vital role in ensuring that the science that is published is relatively robust and reliable. **Such assurance is vital, particularly if the science in question is to be used as the basis of public policy.** Yet reducing the debate about public engagement to the issue of whether scientific hypotheses should be decided by the ballot box is to do a disservice to the many powerful arguments in favour of greater engagement than is currently encouraged. A common complaint of many developing countries, for example, is that their scientific communities remain locked in a mind-set inherited from the colonialist past, where universities remain ivory towers whose research agendas are deliberately cut off from the surrounding world. **The proper response to the increasing domination of research by market factors (including the pursuit of private profits) is not to reinforce this ivory tower mentality. Rather it is to explore new ways (for example, through technology assessment initiatives or so-called consensus conferences) through which public engagement can be encouraged.** This must be done in a way that includes an adequate appreciation by those on all sides of the debate of the importance of ensuring that individual scientists can work as creatively and imaginatively as possible**. If this critical appreciation can be achieved, it will have established the foundation on which a truly democratic science can be built, without distorting the practice of science in the process.**

Colonization Advantage

SETI key to colonization

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 10, 21 July 2011) SW

There are strong justifications for continuing, indeed accelerating, the search. Professional astronomers have, in essence, a commission to keep an eye on the universe. Even as astronomers are obliged to inventory stars and the rest of the physical universe, they must now join with a variety of other disciplines to survey the biological universe (Dick, 1996). Their responsibilities include looking for evidence of cosmic life in all of its forms, ranging from fossilized single- celled organisms through technologically advanced civilizations. During the next millennium we may not only establish a permanent human presence throughout our solar system, but also begin interstellar migration. As we prepare to move beyond our solar system over the next few centuries, it will be essential to understand the nature and distribution of life within our part of the galactic neighborhood. Depending on what we find, our discoveries could be crucial for averting disasters ranging from backcontamination and disease through conflict with extraterrestrial spacefarers. The sheer discovery of any form of life would have profound effects on philosophy, science, and religion. The ability to communicate freely with a technologically and perhaps spiritually advanced civilization would intensify and augment those effects, altering our culture in both straightforward and subtle ways.

Only colonization can avoid inevitable extinction

Baum, and scholar at Columbia University's Center for Research on Environmental Decisions 10

(Seth D., Ph.D in Geography from Pennsylvania State University and M.S. in Electrical Engineering from Northeastern University, “Cost–Benefit Analysis Of Space Exploration: Some Ethical Considerations”, Space Policy Volume 25, Issue 2, May, pg 75-80, http://www.sciencedirect.com/science/article/pii/S0265964609000198)

Another non-market benefit of space exploration is reduction in the risk of the extinction of humanity and other Earth-originating life. Without space colonization, the survival of humanity and other Earth-originating life will become extremely difficult – perhaps impossible – over the very long term. This is because the Sun, like all stars, changes in its composition and radiative output over time. The Sun is gradually converting hydrogen into helium, thereby getting warmer. In some 500 million to one billion years, this warming is projected to render Earth uninhabitable to life as we know it [25] and [26]. Humanity, if it still exists on Earth then, could conceivably have developed technology to survive on Earth despite these radical conditions. Such technology may descend from present proposals to “geoengineer” the planet in response to anthropogenic climate change [27] and [28].2 However, later – around seven billion years later – the Sun will lose mass that spreads into Earth's orbit, causing Earth to slow, be pulled into the Sun, and evaporate. The only way life could survive on Earth would be if, by sheer coincidence (the odds are on the order of one in 105 to one in 106 [29]), the planet happened to be pulled out of the Solar System by a star system that was passing by. This process might enable life to survive on Earth much longer, although the chances of this are quite remote. While space colonization would provide a hedge against these very long-term astronomical threats, it would also provide a hedge against the more immediate threats that face humanity and other species. Such threats include nuclear warfare, pandemics, anthropogenic climate change, and disruptive technology [30]. Because these threats would generally only affect life on Earth and not life elsewhere, self-sufficient space colonies would survive these catastrophes, enabling life to persist in the universe. For this reason, space colonization has been advocated as a means of ensuring long-term human survival [32] and [33]. Space exploration projects can help increase the probability of long-term human survival in other ways as well: technology developed for space exploration is central to proposals to avoid threats from large comet and asteroid impacts [34] and [35]. However, given the goal of increasing the probability of long-term human survival by a certain amount, there may be more cost-effective options than space colonization (with costs defined in terms of money, effort, or related measures). More cost-effective options may include isolated refuges on Earth to help humans survive a catastrophe [36] and materials to assist survivors, such as a how-to manual for civilization [37] or a seed bank [38]. Further analysis is necessary to determine the most cost-effective means of increasing the probability of long-term human survival.

Colonization Adv. Extension – SETI Key

New planetary findings can be detected from SETI exploration

Tarter, Director of the Center for SETI Research at the SETI Institute, 2001

(Jill, Annual Review of Astronomy and Astrophysics, 39, EBSCO, “SETI”,) PG

Because life as we know it is a planetary phenomenon, the search for extrasolar planets, a better understanding of how the Earth and our own solar system formed, and whether our system is typical are all relevant to the question of life elsewhere in the universe. Therefore, efforts are aimed not only at detecting planets (particularly terrestrial planets) close to home so we can probe them for potential biomarkers, but also at making a census of planets and solar systems associated with large populations of **stars.** Given sufﬁcient angular resolution and methods for dealing with the extreme contrast ratio of stellar light to reﬂected planetary light in the visible or infrared— adaptive optics, speckles, and nulling interferometers—any planets around the nearest stars may be directly imaged.Other methods of detection are indirect. It is possible to measure the reﬂex motion of the star about the planetary system’s center of mass owing to the gravitational tug of its orbiting planets. One can also measure the diminution of stellar luminosity as a planet transits, or the magniﬁcation of the light of a distant star by a properly aligned planet (sitting near the Einstein ring at a distance RE from the foreground parent star), creating a short-lived gravitational microlensing event**.**

Radio telescopes can be used to find “Earth-like” planets

Doyle, SETI Institute Principal Investigator 05

(Laurance ,The SETI Institute, “Detecting Other Worlds VIII: Radio Detection” ,5-2, <http://www.seti.org/page.aspx?pid=798> ,6-21-11,GJV)

We have discussed to date seven methods for detecting extrasolar planets in this series. During that time another two dozen extrasolar giant planets have been discovered, and the Kepler Mission, which will detect Earth-like planets around Sun-like stars, has been accepted by NASA as a Discovery Program. Within the next decade, therefore, we should have an idea if other "Earths" exist. Could there be a more exciting time than the beginning of such a Renaissance in our perspective of our place in the universe? This is the final article in the Detecting Other Worlds series. **Today we will discuss the detection of extrasolar planets using radio telescopes. Jupiter, for example, puts out radio signals due to its huge magnetic field. An extremely simplified model of magnetic fields requires two components: a metallic core and movement. Jupiters hydrogen core is metal-like and the planet itself rotates about twice as fast as the Earth, giving it a magnetic field that can, for example, deliver 5 million amps of electric current to its nearest large moon, Io. It is interesting that, at a radio frequency of about 10 Megahertz, energetic particles in Jupiters magnetosphere can outshine the quiet (i.e. starspot inactive) Sun!** Thus the possibilities of imaging a star with a Jupiter-like planet might not be that difficult even though their brightness ratios are significantly different. (See the Rayleigh criterion discussion in my essay on Direct Imaging.) In the infrared, Jupiter is, of course, a billion times fainter than the Sun. **So how might one go about detecting "Jupiters" around other stars by their radio emissions? Several authors have suggested that an array of about 100 eight-meter antennas - in particular, millimeter-wave telescopes - located in the very dry east Antarctic Plateau could detect "Jupiters" at a wavelength of about 1 millimeter (300 Gigahertz frequency), and at a distance of about 4 parsecs (about 13 light years) in a matter of days. Unlike the radio velocity method, the farther from their parent star the "Jupiters" are, the more easily detected (resolved) they would be. The detection of such "Jupiters" would be interesting since such a large mass in another solar system may be needed to clear it of comets (see my essay on Circumstellar Habitable Zones). For example, if Jupiter were not in our Solar System, we would have a large cometary impact on Earth every few ten-thousand years, as opposed to every tens-of-millions of years. As far as detecting evidence of exobiology, radio is a very good candidate**. Of the various methods (weve talked about ozone detection, albedo changes due to forests, and so on), the most unequivocal for the remote detection of exobiology remains the SETI (search for extraterrestrial intelligence) method. The main endeavor, of course, is to detect narrow-band radio signals from another civilization.

No Contact = Colonization

Finding no intelligent life promotes colonization

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 11, 21 July 2011) SW

If the search continues for centuries, perhaps to the dawn of the next millennium, then we will live with the implication that we are alone in the universe. We will conclude that the circumstantial evidence assembled during the 20th century was misleading. Ben Finney suggests that if we do not find ETI, we ourselves may be encouraged to spread the universe with intelligent life: However sobering [no confirmation would be] for cosmic evolutionists, those interested in human space expansion would certainly take the apparent absence of extraterrestrials in our galactic neighborhood as a green light for humanity spreading throughout that region. Let us further imagine that through learning how to settle in and around various planets and smaller bodies of our solar system and the development of powerful space drives and multigeneration spaceships, humans would eventually be able to migrate to nearby star systems and found viable communities there. Then frustrated would-be students of independently evolved extraterrestrials would have the opportunity to study how our descendants evolve culturally and biologically as they scatter through space… (Finney, 1999) Would we ever concede that we are alone in the universe? Given that beliefs in extraterrestrial life have persevered for centuries, it is doubtful that all citizens of our solar system would accept this conclusion. As new generations are born, as new search rationales are developed, and as new search technologies come on line we might expect sporadic searches into the indefinite future.

\*\*\*Solvency\*\*\*

Government Funding Key

Without government support, SETI does not have funds for operation

Mckie, science editor of The Observer, 2010

(Robin, “First Contact,” Sydney Morning Herald, Health and Science p.19. February 25, NS)

For starters, Shostak says, hunting for aliens has been stymied - until recently - by lack of resources and equipment. With the consistent refusal by governments to fund SETI programs, its practitioners have had to borrow time on astronomical radio telescopes, usually for only a few days at a time. At best, they have been able to look at a few promising stars over a range of a few radio frequencies. Shostak compares it to "like trying to do medical research when you have to go next door to borrow a microscope for a couple of hours at most".

SETI cannot thrive without funding

Eldridge, reporter, 1992

(Earl, “Congress Mars Search for Alien Signal,” Chicago Sun Times, p. 6, June 17, NS)

"If we are ever going to balance the budget, we must start cutting somewhere, and a low priority program like SETI is one budget item that is just going to have to take a back seat until the budget is balanced," Bryan said. Tom Pierson, executive director of SETI, said NASA has completed construction of the devices needed for the scanning and is now "debugging" them. The schedule calls for SETI to make the first attempts to detect alien communications on Oct. 12, 12 days into the new federal fiscal year. But without the funding, it may not.

Funding cuts hurt SETI activity

Holden, professor of environmental policy on leave science, 2011

(John, “Space telescope on the trail of ET,” Science Today, p.13, June 23, NS)

Seti has also become the umbrella term for any activity people engage in to search for evidence of extraterrestrial life. The Seti Institute in California was first established to consolidate this activity by taking a more structured and scientific approach. Microsoft co-founder Paul Allen has donated around $30 million (EUR 20.87m) to the project over the years, but US government spending cuts earlier this year have made it impossible to keep the search for ET alive. Yet even as Seti activity in the US declines, interest is building across Europe thanks to the development of some kick-ass science and public interest in space exploration.

Should Triple the Funding

Should tripe support for SETI – finding ET’s good for human civilization

Tough PhD Professor at the University of Toronto ’02

(Allen, “Post Biological Implications For SETI” 4-28-02 <http://ieti.org/tough/articles/post.htm> MLF 6-21-11)

First, our society's total support for SETI should be immediately tripled. Tapping into the extraordinary body of alien knowledge and wisdom could bring beneficial new perspectives and capacities to our human civilization. Because these benefits could be so valuable, our society should put plenty of effort and resources into finding a one-way message from ETI or, even better, achieving a scientific and philosophical dialogue. The SETI field should be funded generously from the public scientific purse as well as from private donors. Triple today's total level of funding for SETI would be just a good beginning. What other field of science has the potential to bring such advanced, fresh, valuable knowledge to human civilization?

USFG Funding Sources

National Science Foundation or Air Force could fund

Lemonick, Senior Writer at Climate Central, 4-28-11

(Michael: “ET, Call Us — Just Not Collect” 4-28-11 <http://www.time.com/time/health/article/0,8599,2067855,00.html> MLF 6-24-11)

By rights, SETI — the search for extraterrestrial intelligence — should be entering its golden age. After decades of begging or borrowing time on other people's telescopes to scan the skies for repetitive radio signals suggesting intelligent life, SETI scientists finally got their own equipment a few years ago: the Allen Telescope Array (ATA) in California. The Kepler satellite, which has found more than 1,200 possible planets around other stars so far, has handed the ATA a bonanza of promising new targets, with more to come. And there is no shortage of powerful electronics and computers to analyze any incoming data — information-processing muscle that SETI pioneer Frank Drake couldn't have imagined when he first started listening to the heavens back in 1961. So it was especially distressing to SETI fans when a letter went out a couple of days ago from Tom Pierson, CEO of the SETI Institute in Mountain View, California. "Effective this week," he wrote, "the ATA has been placed into hibernation due to funding shortfalls for operations of the Hat Creek Radio Observatory (HCRO) where the ATA is located." Admits Jill Tarter, the Institute's research director, "We've been in better shape." (See a brief history of intergalactic warfare.) It's not the first time SETI has faced funding challenges. In the early 1980's, Wisconsin Senator William Proxmire ridiculed the whole idea of looking for ET and forced NASA to stop funding the project. In the end, a personal visit by Carl Sagan got him to reverse course. But then in 1993, Nevada Sen. Richard Bryan did it again, pointing out (weirdly) that "not a single Martian has yet been found." Since then, SETI searches have relied mostly on private money — notably, on the nearly $25 million donated by Microsoft co-founder Paul Allen to help build the ATA, on the grounds of the University of California's Hat Creek Observatory. But Allen's donation, along with money from the SETI Institute, were sufficient only for the construction of the array, not for its ongoing operations. That responsibility went the University of California — and like most public institutions in California, the University is more or less broke (it's gotten so bad that astronomers at Berkeley have been known to vacuum their own offices because so many maintenance workers have been let go). Thanks to the disastrous economy, meanwhile, private donations to the SETI Institute have dropped off. And the National Science Foundation, which also helps fund Hat Creek, is suffering along with every other institution that depends on the federal budget. (Read a Q&A with Ray Bradbury.) "If you think of SETI as not just research but exploration," says SETI Institute Senior Astronomer Seth Shostak, "this is like sending Captain Cook to the South Pacific but not giving him any food or supplies." (Shostak, who seems to have nautical analogies to burn, told the San Jose Mercury News that the suspension is like "the Nina, Pinta and Santa Maria being put into dry dock.") But Shostak insists that all is not yet lost. "ATA is in hibernation," he says, "not embalmed." A skeleton staff is maintaining the array's 42 radio dishes, computers and other electronics so that if new funding does come through, the search will be ready to resume. The SETI Institute has issued new pleas for private donations to help make that happen, and it's conceivable — though not overwhelmingly likely — that the National Science Foundation will somehow find some money stashed away. "We're hoping," says Tarter, "that the public will speak up about how important SETI is." A better bet is the Air Force, which is considering buying time on ATA for use as a monitoring station to keep tabs on orbital space debris that could threaten satellites. While ATA is the most important SETI installation, it isn't the only one, and that keeps alien hunters from despairing completely. The public often assumes "SETI" and "The SETI Institute" are one and the same, but the former is an entire field of astronomy, while the latter is just one institution. There's an ongoing SETI search using the giant Arecibo radio telescope in Puerto Rico, and Harvard astronomer Paul Horowitz is looking for aliens that might communicate with lasers rather than radio beams. "The Italians have a pretty good SETI search going on as well," says Shostak, "and there's a lot of interest in China as well." Still, the shutdown is a blow to those who care about whether we're alone in the universe. "It's really frustrating," says Tarter. "We're here with 1,235 gorgeous new exoplanets from Kepler. This is the first time ever we've been able to say 'we know good places to look, we're not just guessing about which stars might have planets.'" It's even better than that: Kepler is almost certain to find not just planets, but planets of about the size and temperature of Earth. That doesn't necessarily guarantee life, let alone intelligent life, let alone intelligent life that happens to use lasers or radio waves to communicate between the stars. But as MIT physicists Philip Morrison and Giuseppe Cocconi observed in a 1959 Nature paper that laid the intellectual groundwork for SETI, "The probability of success is difficult to estimate," they wrote, "but if we never search, the chance of success is zero.

Allen Telescope Array Solves

The ATA means that we will encounter ETI soon

Shermer, Columnist Scientific American, 11

(Michael, June, Scientific American, Volume 304, Issue 6, p86-89, EBSCO, “The Myth of the Evil Aliens”) PG

With the Allen Telescope Array run by the SETI Institute in northern California, the time is coming when we will encounter an extraterrestrial intelligence (ETI). Contact will probably come sooner rather than later because of Moore's Law (proposed by Intel's co-founder Gordon E. Moore), which posits a doubling of computing power every one to two years. It turns out that this exponential growth curve applies to most technologies, including the search for ETI (SETI): according to astronomer and SETI founder Frank Drake, our searches today are 100 trillion times more powerful than 50 years ago, with no end to the improvements in sight. If E.T. is out there, we will make contact. What will happen when we do, and how should we respond?

AT: Other Telescopes Solve

Only ATA solves communication with unique tech

Pescovitz, writer and researcher for UC Berkeley, 4

(Dec. 23, 2004, David, writer and researcher for UC Berkeley, “Scientists: 'We'll detect an extraterrestrial transmission within 20 years”, [**http://www.physorg.com/news2493.html**](http://www.physorg.com/news2493.html), 6.27.11, SWolff)

The SETI Institute predicts that we'll detect an extraterrestrial transmission within twenty years. If that turns out to be true, it'll probably be the folks at UC Berkeley's Hat Creek radio observatory who will have heard the call. Right now, the Allen Telescope Array of more than three-hundred dishes is under construction at Hat Creek five hours north of San Francisco. Within a year, the first thirty dishes will be operational, forming the basis of a giant ear that listens for intelligent beings in space while simultaneously gathering data for groundbreaking astronomy research. Ads by Google Welch Allyn Diagnostics - Discount Diagnostic Sets, Otoscopes ophthalmoscopes/stethoscopes/parts - www.steeles.com Image: Three prototype radio dishes now in place at Hat Creek Observatory in northern California. By 2007, 350 of these 6.1-meter-diameter dishes will be assembled to form the Allen Telescope Array, the largest radio array in the world. (courtesy Radio Astronomy Laboratory) William "Jack" Welch, UC Berkeley professor of electrical engineering and astronomy, has been a driving force in the design and construction of the Allen Telescope Array (ATA) since the project first got off the ground five years ago as a joint effort between UC Berkeley and the SETI Institute. Named for major donor Paul Allen, co-founder of Microsoft, the array will eventually consist of 350 6.1-meter radio dishes electronically networked together into a radio telescope with unprecedented sensitivity. Precisely distributed across 2.6-acres on the Hat Creek grounds, the combined dishes will have far greater sensitivity than much more expensive 100-meter telescopes. The SETI project scours millions of radio channels for narrow-band signals, indicative of intelligent origin. It's like listening for a station as you twist your car radio's tuning knob past all the static. Until now, SETI has used limited time from myriad radio telescopes around the world, limiting the number of stars that can be observed. However, the ATA will be dedicated to the project, speeding up the SETI search by a factor of 100. Meanwhile, the unique design of the system enables astronomers to monitor a huge range of wavelengths to observe other cosmic phenomena simultaneously with the SETI search. "SETI is admittedly a long-shot," says Welch, holder of UC Berkeley's first Chair in the Search for Extraterrestrial Intelligence. "I don't have the patience to do only that, so it appeals to me to have a steady flow of other data for us to study as well." For example, Welch and his colleagues will use the array to make a cosmological map of atomic hydrogen, the most abundant element we know of. Indeed, the visible universe may be composed of up to ninety-percent hydrogen. Determining its spatial distribution in nearby galaxies could provide insight into the evolution of the cosmos and the mysteries of dark matter. "We'll be able to look halfway back to the beginning of the universe," Welch says. "The ability to observe that far back into time is limited right now." To crank up the telescope's sensitivity, Welch and his colleagues devised a bit of ingenious antenna technology. In traditional pyramid-shaped antennas like those used in the ATA, the signal is picked up at the tip of the structure, called the feed, and runs down wires to the receiver. The problem, Welch explains, is that much of the signal gets lost along the way. To keep the signal as pure as possible, the Berkeley researchers shoehorned the receiver components inside the feed itself. "It's just one new wrinkle for technology that was originally developed in the 1950s, but it enables our feed to essentially have no limitation on bandwidth," Welch says. Right now, just three prototype dishes are being put through their paces at Hat Creek. In the next few months though, the researchers will install more than two-dozen others, nearly one dish a day. By Summer, Welch hopes this first small array will be scanning stars many light-years away. Whether ET is intelligent enough to call remains to be seen, or rather heard, but Welch is convinced that there's something out there. "The recent discovery of planets around many nearby stars is a strong argument that our solar system isn't really unique at all," he says. "That in itself makes it almost certain that there are nearby planets with some kind of life on it."

Other telescopes have to run on borrowed time

Mckie, science editor of The Observer, 2010

(Robin, “First Contact,” Sydney Morning Herald, Health and Science p.19. February 25, NS)

For starters, Shostak says, hunting for aliens has been stymied - until recently - by lack of resources and equipment. With the consistent refusal by governments to fund SETI programs, its practitioners have had to borrow time on astronomical radio telescopes, usually for only a few days at a time. At best, they have been able to look at a few promising stars over a range of a few radio frequencies. Shostak compares it to "like trying to do medical research when you have to go next door to borrow a microscope for a couple of hours at most".

Radio Telescopes Solve Best

Radio experiments are better than observational experiments – less energy cost

Shostak, Radio Astronomer at SETI Institute, 1

(Seth, April, Vol. 101, Issue 4,Sky & Telescope, EBSCO, “The Future of SETI”) PG

Radio works. And 30 years ago, researchers were convinced it works best -- better than light, for instance. The argument was twofold. **Microwaves handily penetrate interstellar dust, whereas visible light is blocked**. But a subtler point is that **radio requires less energy per bit of information**, which ought to make it the communication medium of choice for any alien engineers. In the radio regime, **the minimum background noise you'll encounter is the faint,** 2.7 degrees Kelvin afterglow of the Big Bang. In the microwave part of the spectrum this means **you typically need to receive just 50 photons per bit to stand out from the noise.** No problem. But at higher, optical frequencies, a photon is more energetic and expensive. Even a single infrared photon packs 5,000 times more punch than the group of 50 necessary to send one bit at microwave frequencies. So higher frequencies mean higher energy costs.

Radio experiments are improving—an ideal radio experiment is feasible

Shostak, Radio Astronomer at SETI Institute, 1

(Seth, April, Vol. 101, Issue 4,Sky & Telescope, EBSCO, “The Future of SETI”) PG

Radio SETI may no longer be the only game in town, but it's still the game to which most researchers belly up. That's because the odds of a jackpot, though quite unknown, **are unquestionably getting better all the time -- because the instruments are growing more capable by leaps and bounds. The ideal SETI radio telescope** can only be imagined. It **would monitor every point on the sky, in every radio channel from one end of the microwave window to the other** (about 1,000 to 11,000 megahertz), all the time -- a true Omnidirectional Search System, or OSS. Unfortunately, **this ideal** is a very long way off. But **it's no longer impossible to work toward.** The STWG team considered what it would take to build a reasonable interim OSS. They were seduced by the thought of a telescope able to find powerful but intermittent signals, the kind that none of the current large SETI experiments has a hope of detecting.

AT: False Signals

SETI scientists can identify ET signals definitively

Folger, Editor at Discover, 11

(Tim, January, Scientific American, Volume 304, Issue 1, p40-45, EBSCO, “Contact the Day After”) PG

**SETI SCIENTISTS** THINK they **know, in broad terms, what an ET signal will look like. To stand out as obviously artificial against a background of natural cosmic radio emissions, the signal would have to be narrow, with a lot of energy packed into a few frequencies. Natural phenomena, such as pulsars and interstellar gases, spew out radio emissions at many different frequencies**. If an observatory ever receives a narrowband signal coming from an astronomical distance, the source would almost certainly be artificial.

SETI good—prevents false alarms

Harrison, Professor Emeritus, University of California, Davis, 97 (Albert A., After Contact, Google Books, 1997) PG

Policy development and advocacy, science education and information control are among the strategies proposed for guiding humanity through the search process and its aftermath. Over the years**, SETI committees of the International Academy of Astronautics**, along with other groups, have **developed policies intended to prevent false alarm**s (by insisting on careful veriﬁcation) and to release information to beneﬁt all humankind. Logsdon & Anderson [40, p. 89] hoped to frame the initial announcement in such a way as ‘to minimize confusion, anxiety, fear, and perceptions of threat among the general population’. They sought precedents in strategies for announcing earthquakes, nuclear accidents and other disasters. They found that actual announcements (as in the case of the Chernobyl nuclear meltdown) tended to fall short from the ideal.

\*\*\*Answers to CPs\*\*\*

Private CP

Privatization of SETI raises questions of evidence authenticity

Shuch, executive director of the SETI league, 1999

(Paul, *Seti League*, “Standards of Proof for the Detection of Extra-Terrestrial Intelligence,” August 6, <http://www.setileague.org/articles/proof.htm>, June 20, 2011, NS).

A related problem is that non-professional involvement in SETI science increases the opportunity for the perpetration of hoaxes. The SETI League, Inc. has already been peripherally involved in three separate false claims of ETI contact. Two were simple cases of mistaken identity, easily rectified. But the third was an elaborate hoax perpetrated by an internet hacker who broke into our closed signal verification list. It is small consolation to us that this hoaxter was not a member of The SETI League at all. In fact, in analyzing and refuting this claim, our members comported themselves admirably. Responsible science demands that we attempt to prove the null hypothesis -- that is, to try our level best to disprove any claimed contact. Only if we fail in our very best efforts to discredit a signal can we begin to contemplate its validity. The claimed detection from EQ Pegasi was easy to discredit. The screen dumps which were posted to the internet were cut-and-paste masterpieces. They proved the power of our software -- not of our signal processing software, but of a graphics program called Paint Shop Pro. Even though the fraudulent nature of the claims signed "anon1420" was instantly evident to knowledgable SETIzens, the press chose to imply that the SETI community was covering up some great discovery. Such claims call for a prompt but measured response, so as not to subject the SETI community to charges of complicity in conspiracy or cover-up activities. Thus we have a dilemma: how to encourage grass-roots participation while avoiding association with fraudulent and pseudo-scientific claims? Standards of Proof. Which brings us to the issue of what constitutes incontrovertible proof of ETI contact. The question is complicated by the fact that the general public (from whom the Project Argus constituency is largely drawn) may make only a vague distinction between proof and faith. The spectrum of human skepticism vs. gullibility encompasses a wide range of extremes, characterized by diverse viewpoints ranging from "of course they exist -- we couldn't possibly be alone!" to "I'll believe in the existence of intelligent extra-terrestrials only when one walks up and shakes my hand." We must take pains to prevent such declarations of faith from clouding the judgment of our SETIzens. We start by acknowledging that one can never conclusively prove the negative, but that it takes only one counter-example to disprove it. Conservative experimental design demands that we frame our research hypothesis in the null form: "resolved that there are no civilizations in the cosmos which could be recognized by their radio emissions." Now a single, unambiguous signal is all it takes to disprove the null hypothesis, and negate the notion of humankind's uniqueness. But what constitutes an unambiguous signal? A popular definition holds it to be one which could not have been produced by any naturally occurring mechanism which we know and understand. But this is an insufficient condition.

Private CP

Plan is always already a public-private partnership

Grossman Science Journalist at wired.com 6-21-11

(Lisa Science Journalist at wired.com: “Help Bring Back the Alien-Hunting SETI Telescopes” <http://www.wired.com/wiredscience/2011/06/setistars/> 6-21-2011 MLF 6-25-11)

The world’s only telescopes devoted to searching for aliens went dark two months ago because of a lack of funds. Now you can help bring them back. This morning, SETI launched a website called SETIstars to try to gather funds to resurrect the Allen Telescope Array (ATA), which some astronomers call our greatest hope for finding ET. The ATA, a joint project between the non-profit SETI Institute and the University of California, Berkeley, has been scanning the skies for signs of life (among other things) since 2007. The original plan was to build 350 dishes in a specific pattern over the volcanic plains of the Hat Creek Radio Observatory in Northern California, which could cover more of the sky more efficiently than a single dedicated dish. To date, only 42 dishes have been built — and right now they’re lying dormant. SETIstars opens with a concrete goal: Raise $200,000 in 40 days to bring the ATA back online. Donors can choose an amount between $5 and $500 to go directly toward the array’s operating costs, and have their photos and a brief bio featured on the site. That initial $200,000 won’t cover everything; the telescope needs a total of $2.5 million per year. SETI is looking into other sources of funding, such as collaborating with the US Air Force to use the telescopes to track space debris. But the scientists hope lots of small donations from SETI enthusiasts can help fill in funding gaps so the telescope never has to lie silent again. “We’ve long believed, and I hope that we will prove to be correct, that individuals around the world would be willing to donate small amounts of money,” said SETI Institute director Jill Tarter. “If it worked for Obama, crowdfunding should work for us.” Once the ATA is up and running again, it also has a clear goal: Aim directly at potentially habitable planets to see if anyone’s there. Just before the telescope shut down, SETI laid out plans for a two-year program to observe exoplanets discovered by NASA’s Kepler spacecraft that could support liquid water, and maybe life. Future SETIstars projects may involve buying data processing time by the minute, and watching the data stream in on your phone, Tarter said. But ultimately, the project is aimed at uniting the worldwide community of people who care about the search for extraterrestrial intelligence. “We imagine it as their own version of Facebook, to connect and discuss these sorts of things,” Tarter said. “People are always asking me how they can help. Here’s a way. We’re serious about changing the world, changing the way we do SETI, allowing the world to participate. This is a piece of it.

METI CP

Sending messages are redundant and they are unlikely to be intercepted

Kazan, editor of the Daily Galexy, 2010

(Casey, “The Eerie Silence: Should We Be Sending Messages Into Space?,” *The Daily Galexy*, January 30, NS)

After a half-century of scanning the skies for intelligent extraterrestrial life, astronomers have little to report but an eerie silence, eerie because many scientists are convinced that the universe is teeming with life. The problem could be that we've been looking in the wrong place, at the wrong time, and in the wrong way. At this week's conference at London's prestigious Royal Society, Paul Davies, astrophysicist and Director of the Beyond Center for Fundamental Concepts in Science and Co-Director of the Cosmology Initiative at Arizona State University, discussed a new roadmap for the future of SETI, arguing that we need to be far more expansive in our efforts, by questioning existing ideas of what form an alien intelligence

might take, how it might try to communicate with us, and how we should respond if we ever do make contact. There has also been controversy recently over attempts to contact intelligent aliens, where instead of hiding in the corner and listening real hard, some astronomers beamed intense directional messages up up and away. Critics decried these actions as dangerous, though their fears reveal more about us than any eventual ETs. They assume that they would be similar to humanity, so their first response to finding a more primitive culture would be to exploit the hell out of it. While such a fate might be pleasingly ironic (for anyone who isn't human, at least), others contend that any species that can make the journey here has advanced to a point where their goals are rather higher-minded than "Shoot us". Dr Alexander Zaitzev, of the Institute of Radio Engineering and Electronics at the Russian Academy of Sciences, doesn't think much of these worries either way. A proponent of METI (Messaging to Extra-Terrestrial Intelligence), in a recent paper he shows that the odds of one of the METI messages being detected is a millionth of that due to powerful radar pulses regularly used in astronomical investigation. Though whether writing a paper saying "This METI thing we're doing has only a tiny chance of working" is overall a good idea remains to be seen. An important point is that METI represents an intentional will to make contact, rather than the accidental alien interception of some random radiation from Earth - the difference between saying "Hello!" and just being a suspicious strange noise late at night. Most of the objections to contacting aliens are weak under close examination. We can't suddenly decide to hide after fifty years of pumping electromagnetic radiation into space without rhyme or reason - in fact, we'd better hope that an advanced civilization doesn't catch an episode of "American Idol" and just vaporize us outright.

Actively transmitting for messages is dangerous

Folger, Editor at Discover, 11

(Tim, January, Scientific American, Volume 304, Issue 1, p40-45, EBSCO, “Contact the Day After”) PG

**SOME SETI PROPONENTS suggest we should do more than passively wait for a signal**. They believe we should transmit messages and let anyone who might be listening know that we are here. Last spring, in a Discovery Channel series, **Stephen Hawking of the University of Cambridge said that transmitting messages without knowing what is out there could be dangerous**. He warned of the possibility of predatory aliens ravaging the resources of world after world**. "If aliens visit us," he said, "the outcome would be much as when Columbus landed in America, which didn't turn out well for the Native Americans."**

AT: Consult

Protocol requires international consultation for response

Vakoch, Center for SETI Research, SETI Institute 10

(Douglas A., Department of Clinical Psychology. California Institute of Integral Studies. Center for SETI Research, SETI Institute, January 7, “Responsibility, capability, and Active SETI: Policy, law, ethics, and communication with extraterrestrial intelligence,” www.elsevir.com/locate/actaastro) KA

2. Responsible policies: protocols and Active SETI In response to the advances in SETI programs and the prospect in the near future that we may be faced with the detection of evidence that we are not alone in the universe, since the 1980s, under the auspices of the International Academy of Astronautics (IAA) and the International Institute of Space Law (11SL), legal experts, scientists, and technologists have devoted significant attention to legal and policy issues relevant to SETI [6]. This discussion has drawn upon precedents from space law and other legal principles to provide guidance about the transmission of messages from Earth to any extraterrestrial intelligence that might be detected in the course of SETI research, summarized as so-called "post detection protocols." Some have argued that essentially the same legal and policy considerations apply whether one is replying to a signal from an already detected civilization, or whether one is transmitting without prior knowledge that an extraterrestrial civilization exists. Others suggest that decisions about whether to transmit from Earth de *novo.* prior to detecting extraterrestrial intelligence, may require a different deliberative process than traditional. Passive SETI. Guillermo Lemarchand and Donald Tarter, for example, have analyzed the protocol called the "Declaration of Principles Concerning Activities Following the Detection of Extraterrestrial Intelligence" [7]. Some have observed that, based on this document, there should be no transmissions of any sort prior to broad-based international consultation. Specifically, they highlight Article 8. which reads "No response to a signal or other evidence of extraterrestrial intelligence should be sent until appropriate international consultations have taken place." In contrast, Lemarchand and Tarter argue that "the existing SETI protocol does not specifically prohibit active predetection search strategies. It is, after all, a 'post detection' protocol." (p. 140). By time of the 200G International Astronautics] Congress, held in Valencia. Spain, the international SETI community had moved to a point at which there was widespread support for the view that the existing SETI protocols should not be construed to apply to *de novo* transmissions. An editorial in *Nature* [8] maintained that "the Valencia meeting voted against trying to set up any processes for deliberating over the style or content of any spontaneous outgoing messages." (p. 60S) though it would be more accurate to say that the group that met in Spain simply proposed that the current SETI protocols remain silent on the issue of Active SETI, given the different circumstances of replying to a signal from another civilization and of transmitting without prior knowledge that the hoped recipient actually exists. At that same congress, though independent of these discus­sions of the lAA's SETI Permanent Study Group. Kicky Lee's [9] review of legal and policy issues related to SETI included the recommendation that the existing protocols should be modified to distinguish "between a commu­nication sent by the Earth that is directed at a known alien civilisation and a general attempt at creating commu­nications with such unknown alien civilisations..." (p. 5).

AT: Joint/Cooperation CP

If an E.T. signal is real, it will be verified and replied to internationally

Highfield, Editor of New Scientist, 5

(Roger, October 5, The Daily Telegraph, “’The greatest discovery of all time’ The chances are there’s life out there, but any message could be thousands of years old and indecipherable. Roger Highfield reports, Lexis) KA

Unlike the events shown in the film Contact (in which Jodie Foster portrays the celebrated Seti researcher Dr Jill Tarter), "there will be no Eureka moment," according to Dr Shostak. Instead, there will follow a painstaking process of checking and verification to discern a hello from the crackle of cosmic radio waves. There have been many false alarms. In 1977, the "Wow signal" was picked up by researchers at Ohio State University, and so named after a professor scribbled the exclamation next to a printout of the signal. No one has heard it since. Another set of rapid pulsing signals caused great excitement, until they were shown to come from a hitherto unrecognised class of super-dense rotating neutron stars now known as pulsars. Other emanations have been traced to automatic garage doors, satellites and a host of other gadgets. And, of course, there are hoaxes. Prof Davies points out that, if a signal is shown to be authentically alien, it is most likely from a civilisation that is stupendously advanced compared with our own: by the time we receive it, it is highly likely that the transmitting civilisation will be millions of years in advance of us - if it still survives, of course. To date, unfortunately "there has been nothing to set the pulse racing". But if he does suffer palpitations, the protocol says that the team that discovered the signal should telegram the International Astronomical Union and the secretary-general of the UN (as well as their own government). The International Telecommunications Union in Switzerland should also be alerted; it has the power to stop transmissions and would be asked to clear the frequency band that the aliens were using. The discoverer, the protocol says, should make the announcement "promptly, openly and widely through scientific channels and public media". Dr Shostak emphasises there will be no "X-Files-style cover-up", or pressure from authorities to classify the discovery. But, of course, there will be endless hand wringing over how to manage the announcement and what to do about leaks to the media. Then comes the question of whether to reply to ET. In April 1989, the trustees of the International Academy of Astronautics approved a protocol that declared finally: "No response to a signal or other evidence of extraterrestrial intelligence should be sent until appropriate international consultations have taken place."

The SETI Institute won’t respond to E.T. without international cooperation

Shostak, alien hunter at the SETI Institute, 11

(Rachel Saslow - Interviewer, Staff Writer for the Washington Post – specializes in Health and National issues, June 21, Washington Post, “Q-and-A with 'alien hunter' Seth Shostak Q and A with 'alien hunter' Seth Shostak,” Lexis, http://www.lexisnexis.com/hottopics/lnacademic/) KA

How are we going to respond if we do get a signal? There are some protocols. You would verify the signal, make sure it's extraterrestrial and not some prank. Then you would tell everyone, but the protocol says you won't respond without international consultation. I don't think the aliens would care what our response would be. To begin with, if you pick up the signal, it's coming from hundreds of light years away and it would take that long for the response to reach them. So there's no hurry to grab the microphone.

\*\*\*Answers to Ks\*\*\*

AT: any K…

Aliens know your kritik best, let’s ask them

Tough, Professor Emeritus at the University of Toronto, ’00

(Allen, *Foundation for the Future*, 2000, “When SETI Succeeds: The Impact of High-Information Contact”, www.futurefoundation.org/documents/hum\_pro\_wrk1.pdf , p. 16, 21 July 2011) SW

Post-contact humanity may be privy to partial or full answers to questions about such things as the origin and fate of the universe and the course of evolution and of civilization. We dream of learning “comparative cosmologies,” contrasting theories of the ultimate origin of the universe. We dream also of learning the mathematical theory unifying all known forces of nature, or perhaps a theory of the superstrings or a unified theory of science of a type that we have not yet conceived. Ben Finney points out that one of the reasons that the social sciences lack the maturity of the physical sciences is that so far we have had only one opportunity to study the development of consciousness, intelligence, and culture (Finney, 1999). That is the opportunity available on Earth. He points out that astronomy, for example, would have not progressed very far if astronomers had been forced to develop a theory of planetary evolution based solely on knowledge of our own planet. We need extraterrestrial civilizations “to introduce us to an array of possibilities and variations beyond our experience, and also to shock us out of such parochial views as regarding ourselves as the summit and final goal of evolution….” Information about other civilizations would confer opportunities for comparative scientific studies of cultures, life forms, and psychologies. By the year 3000, under an information-rich detection scenario, we may have assembled a database containing hundreds, perhaps thousands of societies that endured from decades to millions or billions of years. We might have, for tomorrow’s social scientists, the equivalent of anthropology’s Human Relations Areas Files that facilitate cross-cultural studies for anthropologists. Historians would be able to do quantitative research on comparative civilizations. Multiple opportunities, notes Finney, could move us in the direction of consilience, or the unification of knowledge (Wilson, 1998). So far, only physics and chemistry have achieved consilience to any appreciable degree. The chance to study extraterrestrial civilizations may help us build bridges among the physical sciences, natural sciences, social sciences, and humanities. Finney adds that SETI is one of the endeavors led by physical and natural scientists that has welcomed the participation of social scientists and humanists.

Contact leads to new metaphysics

Harrison PhD Professor at UC Davis and Dick Served as Chief Historian at NASA 2000

(Albert is a PhD Professor of Psychology at UC Davis and Steven Served as Chief Historian at NASA When SETI Succeeds: The Impact of High-Information Contact Edited by Allen Tough “Contact: Long-Term Implications for Humanity” p. 16 http://ieti.org/tough/books/succeeds/sectII.pdf MLF 6-22-11)

Contact with ETI may expose us to new metaphysics and epistemologies. Post-contact humanity may be privy to partial or full answers to questions about such things as the origin and fate of the universe and the course of evolution and of civilization. We dream of learning “comparative cosmologies,” contrasting theories of the ultimate origin of the universe. We dream also of learning the mathematical theory unifying all known forces of nature, or perhaps a theory of the superstrings or a uniﬁed theory of science of a type that we have not yet conceived. Ben Finney points out that one of the reasons that the social sciences lack the maturity of the physical sciences is that so far we have had only one opportunity to study the development of consciousness, intelligence, and culture (Finney, 1999). That is the opportunity available on Earth. He points out that astronomy, for example, would have not progressed very far if astronomers had been forced to develop a theory of planetary evolution based solely on knowledge of our own planet. We need extraterrestrial civilizations “to introduce us to an array of possibilities and variations beyond our experience, and also to shock us out of such parochial views as regarding our selves as the summit and ﬁnal goal of evolution….”

AT: Disposable Earth

SETI provides information to help protect earth’s environment

**Chyba, Environmental Sciences Professor-Stanford, 2003**

**(**Christopher, Space Policy in the Twenty-First Century, ed. W. H. Lambright, p. 199)

NASA has identified the search for life beyond our solar system as a priority. In this light, it is remarkable that the scientific Search for Extraterrestrial Intelligence (SETI) has been altogether absent from the NASA program. SETI is a natural component of any balanced investigation of the origin, evolution, and distribution of life in our galaxy – that is, of astrobiology. There are areas where appropriate private-public partnerships in this field could be of mutual benefit. There is a natural alliance between planetary exploration and the protection of Earth’s environment. Comparative planetology helps us to understand the Earth and therefore the context for Earth’s biosphere and our own civilization. Astrobiology helps us to understand the origin and evolution of life itself. Great harm could be done to this alliance were planetary protection issues to be handled with anything other than forthrighteness and transparency.

Even if ETs don’t exist, simply the search for alternate forms of sentient life allows acceptance of the other and an inclusive politics

Regis, Department of Philosophy, Howard University 87 [Edward, 1987,  He specializes in books and articles about science, philosophy and intelligence. His topics have included nanotechnology, [transhumanism](http://en.wikipedia.org/wiki/Transhumanism) and [biological warfare](http://en.wikipedia.org/wiki/Biological_warfare), Extraterrestrials: science and alien intelligence, p.14-15]

Thinking about and even hoping to find extraterrestrial civilizations, however, sharpen our search for and appreciation of the peculiar virtues and vices of the only form of life we know. Exobiology and other exo-sciences cannot proceed merely by generalization from terrestrial experience; they must construct models of a more abstract nature of which terrestrial life and society are specifications. In that way hypotheses about extraterrestrial situations may throw light on the terrestrial, while the illumination of the extraterrestrial by hard facts about life on earth is at best dim and wavering. What Peter Winch has said about anthropology, we may say about exo-sociology: ‘Seriously to study another way of life is necessarily to seek to extend our own - not simply to bring the other way within the already existing boundaries of our own .... ”' Even if the exo-sciences fail to attain their prime goal, here is a valuable by-product. The quest for other. and better, forms of life, society, technology, ethics, and law may not reveal that they are actual elsewhere; but it may in the long run help us to make some of them actual on earth. Yet after all there is some glimmer of hope for an answer. As long as it exists - and I think it will exist as long as we do - it would be a mistake to let niggardliness. skepticism, and despair inhibit the search. Many more harmful things can be done with our technology than listening for another civilization. lf it should be successful. probably nothing is more worth using it for. So we have to ask. how should we proceed, and what shall we do if we succeed? To the first, there are two simple and prudent answers. Let us give more thought to possible worlds so as to prepare ourselves to interpret any evidence we get that they are actual. Here is work for disciplined science-fiction writers, astronomers. biologists, psychologists, sociologists. and linguisticians. l venture to believe that even philosophers might be of some help. Second. let there be world-wide sharing of resources of radio observatories. If all appropriate observatories devote some time to a systematic project of this kind. the costs in other more efficient research can be equitably spread.” But it must be remembered that the search is not worth undertaking unless it is planned to last decades, centuries, or even forever. Such cooperation would be a small stop in bringing about the discovery of how much enlightened intelligence there is on one planet at least, our own.

AT: Disposable Earth/Anthro

SETI represents the final frontier of anthropocentrism – ETI can finally end dominant understandings of humanity and its relationship to the universe

Dick, U.S Naval Observatory 93

(Steven, U.S Naval Observatory, Space Science Reviews, Peer Reviewed Journal, The Search for Extraterrestrial Intelligence and the Nasa High Resolution Microwave Survey (HRMS): Historical perspectives, http://www.springerlink.com/content/m862ww373v388075/]

In the context of the history of science, SETI stands in the tradition of one of the most persistent and elusive problems in the history of Homo sapiens: the quest for humanity’s place in the Universe. For two millennia after Aristotle (4th century BC), that place was defined by the geocentric cosmology of heavenly spheres. This concept of a Universe with the Earth at its center was superseded in the 16th century by the Copernican theory that the Sun was central in the planetary system. Until the twentieth century, anthropocentrists could still harbor hope that at least our solar system was central in the Galaxy of stars of which our Sun is a part, and indeed at the turn of the century many eminent scientists, including Kapteyn (1908) and Wallace (1904), still held such a view (E-igure 1) based on empirical argument. But by 1918 Shapley (1918) had shown that our solar system was at the periphery of the Milky Way galaxy, and was an insignificant conglomeration of matter by comparison to the billions of other suns that composed the Galaxy (Berenzden et al., 1976; Bok, 1974; Smith, 1982). The Galaxy in turn was soon dwarfed by the billions of other galaxies subsequently discovered surrounding it. In physical terms the Earth and the solar system have been successively decentralized since the scientific revolution initiated by Copernicus, leaving no doubt of our unexceptional location in the geography of the Universe. Photographs of M31 (Figure 2), a galaxy similar to our own, symbolically represent the new universe, and are often used in SETI literature to depict graphically the insignificant nature and peripheral position of our solar system. The concept of extraterrestrial life represents, in its broadest sense, the biological dimension to the debate over the status of humanity in the Universe. Even if the Earth were not physically central, the question remains whether it is in any sense biologically central. Science since the 17th century had demonstrated that physical law was universal; the question remained whether ‘biological law' might also be universal. In the broad context of intellectual history, it is imponant to understand that the extraterrestrial life debate - especially the Search for Extraterrestrial Intelligence - represents the last battle over anthropocentrism. It is this aspect that both confers its universal interest and incites such passionate arguments by proponents and opponents.

\*\*\*Answers to DAs\*\*\*

SETI - Republican Support

Republican supports for SETI funding

Bates, CEO of Creation Ministries International-US, 4

(Gary, Alien intrusion, p.77, google books)

This is not what many really want to hear. It might be prudent for SETI to learn a few marketing tips from NASA — and indeed they have — the public's fascination for extraterrestrial life, and also its involvement via the SETI<S>home project, has proved to be SETIs savior. Incredibly, SETI recently received a boost in funding from an unexpected source — its former critic, NASA. Why did NASA so radically change its policy toward something formerly deemed a waste of money — especially since nothing changed as far as evidence was concerned? The answer seems obvious, even though NASA denies that anything in its approach to space exploration has changed. NASA's Origins program has captured public interest and loosened the public purse, and SETI's ET focus certainly does no harm to NASA's stocks. Lamar Smith, a member of the U.S. House of Representatives, confirmed that SETI was more popular than it was given credit for, when he said:

Funding should match public interest ... and I don't believe it does/

SETI – No Opposition

SETI isn’t controversial anymore

**Kaufman**, staff Washington Post, **11** (Marc, “Search for extraterrestrial life faces setback with SETI telescope ‘hibernation’,” , 4-27, Washington Post, <http://www.washingtonpost.com/national/search-for-extraterrestrial-life-faces-setback-with-seti-telescope-hibernation/2011/04/27/AFZ8O3yE_story.html>)

SETI has long had passionate supporters and an army of critics. Congress specifically banned any funding for SETI in 1993 at the urging of then-Nevada Sen. Richard Bryan. Those restrictions were lifted by NASA and the National Science Foundation toward the end of the Bush administration, when officials concluded SETI and its Allen array offered high-quality science.

No Link—funding for SETI won’t cause congressional backlash

Triplett, Washington reporter, 01 (William, “Search for alien life reasserts its credibility,” Nature, 7-19, p. ProQuest)

The much-maligned Search for Extraterrestrial Intelligence (SETI) programme is slowly rebuilding its credibility in Washington, where some law-makers would like to see NASA restore links with it. Congress stopped all public funding for SETI in 1994, after some members ridiculed it as squandering taxpayer’s money on a quest for “little green men”. But the project has made considerable headway since then with private funds, and on 12 July a congressional committee heard testimony on it, as part of an overview hearing on research into whether life exists beyond Earth. Leaders of the project, which is organized by the SETI Institute in Mountain View, California, say they are not seeking a restoration of government funds. But Christopher Chyba, one of the institute’s directors, told the hearing of the space and aeronautics subcommittee of the House Science Committee that the project would like to overturn the current ineligibility of SETI proposals to compete for peer-reviewed grants from NASA’s astrobiology programme. “These grants should be open to SETI researchers to apply for in a peer-reviewed way just as they are for anyone else,” says Chyba. He adds that SETI, by searching for other intelligence, is addressing one of astrobiology’s central questions. Since losing its federal funding in 1994, SETI has not only survived but has grown through philanthropic donations, primarily from wealthy technology pioneers such as William Hewlett, David Packard, Gordon Moore, Paul Allen and Barney Oliver. Michael Meyer, a senior scientist at NASA’s astrobiology programme, says that as a result of the congressional language used in removing SETI from the federal budget, the agency is effectively prohibited from funding SETI-specific activities even through grants, which are awarded only to proposals involving “good science”. SETI critics have argued in the past that SETI does not constitute good science. But Lamar Smith (Republican, Texas), whose enthusiasm for the project led to the hearing taking place, noted that SETI’s track record has improved markedly in recent years. Indeed, Chyba points out that successive decadal reviews of astronomy by the National Academy of Sciences have endorsed SETI. The most recent one singled out the project for pioneering new technology that will have other useful applications. But whether NASA is ready to offer astrobiology grants to SETI is another matter. “The SETI Institute has been very successful and they do some good stuff,” says Meyer. “But there’s the issue of once burnt, twice shy. We’re growing an astrobiology programme that seems to be fantastically popular with not only the public but with the White House Office of Management and Budget and with Congress and even within NASA. But there could be concern that if we include SETI in this, while intellectually it fits within the programme, all of a sudden the enthusiasm you had gets turned back into why are we looking for little green men?” But Smith told the hearing: “The discovery of life in the Universe would be one of the most astounding discoveries in human history. Funding should match public interest and I don’t believe it does.” He was backed up by Zoe Lofgren (Democrat, California). According to one congressional staff member, Congress is moving slowly towards an acceptance, if not an embrace, of SETI. “There’s really no groundswell for restoring a federal funding line for SETI right now,” says the staffer. “Then again, there’s no real opposition to it, either.”

No government opposition to SETI

Kaufman, The Washington Post, 9

(Marc, December 22, pHE01, LexisNexis,“Hello, again. Anybody out there?; Official endorsements boost the search for extraterrestrial life”) PG

The dishes also represent a coming-of-age for **SETI** Institute enthusiasts and its sometimes hailed, sometimes ridiculed mission. While their effort was long associated with UFOs, over-excited researchers and little green men, it **is now broadly embraced as important and rigorous science, and astronomers and astrobiologists in an increasing number of nations have become involved in parallel efforts.** "This is legitimate science, and **there's a great deal of public interest in it**," said Alan Stern, a former assistant administrator at NASA who, in 2007, decided that proposals for extraterrestrial search programs should not be banned from the agency, as they had been since the early 1990s. The National Science Foundation had come to a similar decision a few years before.

SETI Popular - Public

SETI is popular with the public

Oliver , Member, Editorial Board of COSMIC SEARCH , 04

(Bernard M. , “Editorial: Let's Get SETI Through Congress,” Cosmic Search, Vol. 1 , No. 2 , 9-21 , pg. 15, GJV)

SETI has enormous popular appeal. Its inclusion as a NASA program would be hailed by the voting taxpaying public who, in general, care little about the scientific discoveries space has produced, but who are enormously interested in the prospect of other intelligent life. Unscientific motion pictures and fraudulent books about extraterrestrial life enjoy unprecedented popularity today. Surely a soundly based, scientific program would be accepted. In fact, most laymen assume that a SETI program is already going on. Isn't it time NASA lived up to this popular belief? SETI has withstood two decades of scientific scrutiny. Each passing year finds scientists more convinced of the abundance of life in the universe, and engineers more pessimistic about the possibility of economically feasible interstellar travel. The only practical way to discover this other intelligent life is to search for radio (or other) signals it radiates. Existing radio telescopes could detect their counterparts anywhere in the Galaxy, but this will never happen unless we search in a systematic way. It is important that we begin now while there are empty bands in the microwave spectrum where we can listen without man-made interference. If we do not pre-empt some of these windows for SETI we will forever blind ourselves to the mainstream of life and end up as Galactic recluses. The real problem may be that our Senators and Congressmen need a little SETI fan mail. People tend to write their representatives to condemn rather than to support, and SETI no doubt has elicited letters of condemnation and derision. Would you help tip the scales the other way? Tell your Congressmen and Senators that you'd be happy if one dollar of your taxes annually went to SETI. Think what a magnificent search program $50 million per year would support!

The public is interested in SETI’s search for ETI

Penny, SETI Institute Principal Investigator, 11

(Alan, Wiley Online Library, “SETI: peering into the future,” <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-4004.2011.52121.x/full> , 6-24-11 , GJV)

SETI has two main aims. There is the expanding exploration of that phase space, always with the possibility of “contact” and the leap forward in our understanding of life in the universe and in many other fields of science and culture that would result. But SETI also addresses the future of humankind, looking for other civilizations that have trodden this path before us. If we find them, then we will know there is a possible way forward. If a particular SETI search comes up with a negative result, then we know that our future may not include the path that that search would have revealed. SETI activity has other components. It involves studies of: how evolution leads from the origin of life to intelligence; the rise and nature of technological civilizations; the problems of communications with fundamentally different entities; the possibilities of interstellar travel. It provides a logical extension to the growing field of astrobiology. Like all high-tech work, it has spin-offs, such as the Berkeley BOINC system of grid computing, originally designed to deal with the flood of SETI data from the Arecibo telescope with the SETI@home project, and which is now used in many fields, including medicine, molecular biology and climatology. And SETI provides a powerful forum for engaging with the public on the nature of scientific studies, using a subject in which the public is already interested.

AT: Spending

We have a moral obligation to fund SETI activities

**Haerendel, Fellow-Max Planck Institute, 2009, (**Gerhard umans in Outer Space – Interdisciplinary Odysseys, ed. L. Codignola, and K. Schrogl, p. 33

Arguments against investments in a full-fledged SETI activity would then mainly be of economical nature, the costs being regarded as too high in view of the low likelihood of success. On the other hand, the enormous philosophical relevance of the question of whether we are or are not alone in the universe is a strong argument. In the long run we cannot be satisfied by just evaluating the Drake equation over the long term. Therefore, I regard it as a moral obligation of humankind to work out a good cost-efficient strategy for continuously searching for signals and sending messages, for the realization and maintenance of such activities, which are to be adapted to the progress in science and technology for the next millenniums. The costs are likely to be much lower than those for human exploration of the solar system.

Only costs 2.5 million

MX Newspaper 4-28-11

(An Australian newspaper: “ET search postponed OFF SETI”, Lexis 4-28-2011, MLF 6-23-11)

The search for alien life was put on hold today after US government budget cuts forced the shutdown of 42 telescopes at the Hat Creek Radio Observatory in northern California. The telescopes were forced into ``hibernation'' because of a $2.5 million funding shortfall, according to SETI (Search for Extraterrestrial Intelligence) Institute astronomer Jill Tarter. The telescopes monitor distant space to pick up any random radio noise.

AT: Brain Drain

Attracting high tech workers for SETI key to US competitiveness

National Radio Astronomy Observatory 6

(Staff produced report, Radio Astronomy: Contributing to American Competitiveness, October, http://www.nrao.edu/news/Technology\_doc\_final.pdf

Building a highly qualified workforce in the U.S. results in increased American competitiveness. Astronomy is an extremely powerful stimulus for attracting students, and radio astronomy naturally lends itself to educational outreach. The mysteries of the universe and the excitement of space exploration are of great interest to many students who will consider making astronomy a career. Astronomy students also study mathematics, physics, chemistry, and engineering. Even if astronomy is not the final career choice for a student, studying astronomy results in a highly qualified workforce for a large cadre of technical occupations, with flexible skills that can adapt to changes in the labor market, and with abilities at levels where most of the jobs exist. Furthermore, well-funded and publicized astronomy programs in the U.S. attract international students who often remain here to work in technical careers in American companies.

<competitiveness key to Heg, o/w impact to Brain Drain>