# Topicality – Shells & Definitions

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# Shells

## 1NC Beyond the Mesosphere

### Interpretation: Beyond the Earth’s mesosphere means you must develop in outer space

### The Mesosphere extends between 31 and 50 miles above the Earth’s surface

WC 11 (Weather Channel – Weather Glossary, “M”, <http://www.weather.com/glossary/m.html>)

MESOSPHERE The layer of the [atmosphere](http://www.weather.com/glossary/a.html#atmo) located between the [stratosphere](http://www.weather.com/glossary/s.html#strato) and the [ionosphere](http://www.weather.com/glossary/i.html#iono), where[temperatures](http://www.weather.com/glossary/t.html#temp) drop rapidly with increasing height. It extends between 31 and 50 miles (17 to 80 kilometers) above the earth's surface.

### And, Beyond is on past

AHD 11 (American Heritage Dictionary, “beyond”, http://education.yahoo.com/reference/dictionary/entry/beyond)

PREPOSITION: On the far side of; past: Just beyond the fence. Later than; after: beyond midnight. To a degree that is past the understanding, reach, or scope of: an evil beyond remedy. To a degree or amount greater than: rich beyond his wildest dreams. In addition to: asked for nothing beyond peace and quiet.

### And,“of” space refers that outer space must be the object

Bocksteigel 95 Research and invention in outer space: liability and intellectual property rights - ed: Mosteshar \* Director of the Institute of Air and Space Law and Holder of the Chair for International Business Law at the University of Cologne, Germany; Chairman of Council of the National German Space Agency (DARA); Chairman of the Space Law Committee of the International Law Association; Member of the Board of Directors of the International Institute of Space Law; Member of the Council of the ICC Institute of International Business Law and Practice. •• Originally presented at the Seminar organized by the IBA and the Institute of International Business Law of the ICC on 6 and 7 December 1990 (Paris).

 The official title of the Outer Space Treaty COST') mentions both exploration and use of outer space as the two 'activities of States' which one has to take into account and which are there- fore covered by the Outer Space Treaty. The same pair of terms appear again in the Preamble as well as further articles such as Article I and Article III of the Treaty. Other articles and other space treaties either take up only one of these two terms or use a general terms such as 'activities in outer space' (Art. VI, OST) or generally deal with 'objects launched into outer space' (Art. VII, Art. VIII, OST and the Registration Convention) or 'space objects' (Liability Convention) or finally 'activities of States on the Moon and other celestial bodies' (Moon Treaty). At first sight, the distinction between exploration and use may seem sufficiently clear. Indeed in connection with most space activi- ties there may be little doubt which of these two terms is applica- ble. First doubts appear, however, because the Outer Space Treaty speaks of exploration 'of outer space'. This wording could be interpreted to mean that space must be the object of the exploration.

### Violation: They do not build past the Mesosphere into space

### Standards-

### Limits- Explodes limits and makes anything that happens on Earth topical because it would either be exploration or development of Earth.

### Ground- We can’t gain links to Aff’s because all of our literature is talking about outer space and it would be impossible to find and research EVERYTHING that would happen on Earth. Most of the core DA’s are talking about why putting things out into space is bad.

### Resolutional Integrity- The original intent of the Resolution is the outer space beyond the Earth’s mesosphere not the mesosphere that is the mantle of the earth, they just happened to mix definitions up so that they can escape virtually any link.

### Voter for reasons of fairness, education, and jurisdiction

## 2NC – Beyond the Mesosphere

### Overview— Under The AFF’s interpretation, any exploration and development that occurs beyond the Earth’s crust is topical. This interpretation makes it possible to send People to mountains or oceans or making people with telescopes look up at the sky or even to the ground topical, making it almost impossible for The neg to research all possible aff’s and there is a topical version of their AFF because they could do it in Space.

### They don’t meet: They don’t develop in outer space, that’s Bocksteigel 95 card

### And prefer because

### Limits: Extend our limits that they explode the topic by making any exploration and development beyond the Earth’s crust topical and this is bad for the Negative because it explodes our research burden to going to China, Russia, even a rural area in Texas just because it is still exploring about the crust.

### Ground: Extend our ground claims there is absolutely no way we can gain any DA or K links because all of the core topic literature we’ve research has been specific to AFF’s that explore/develop outer space and this is better because it lets the Negative have an actual chance to link to a DA or K and have more variety of arguments and have a more equal chance to win the debate.

### Resoultional Integrity: Extend the integrity claims, the Framer’s intent was not for there to be an infinite number of AFF’s by making any Exploration/Development beyond the crust topical but rather the outer space beyond the Mesosphere and this is better for debate because it allows for more competitive debate because both the negative and affirmative would actually have to research Resolutional literature making it a more a fair and educational debate

### Voter for reasons of fairness, education, and jurisdiction

## 1NC – Beyond is Away From

### Interpretation- Our definition of “beyond” is “away from”, and in order for the affirmative to meet our definition of “beyond”, the would also have to meet our definition of Mesosphere, which is defined as 50 miles away from Earth.

### Violation-Beyond must mean away from the speaker, which would also be 50 miles above Earth’s surface.

### Beyond is defined as away from

**Talmey 5** Professor Emeritus of Linguistics University at Buffalo, State University of New York Visiting Scholar University of California, Berkeley From perception to meaning: image schemas in cognitive linguistics Ed. Beate Hampe, Joseph E. Grady

 The class designated as scene segmentation may include only one category, that of "major components of a scene"\*, and this category may contain only three member elements: the Figure, the Ground, and a Secondary Reference Object. Figure and Ground were already seen for the across schema. But schema comparison shows the need to recognize a third scene component, the Secondary Reference Object - in fact, two forms of it: one that is encompassive of Figure and Ground and one that is external to them. The English preposition near, as in (8a), specifics the location of the Figure {the lamp) only with respect to the Ground (the TV) - it could be anywhere roughly within a sphere centered on the TV provided the distance between them is relatively small. But localizing the Figure with the preposition above. as in (8b), requires knowledge not only of where the Ground object is. but also of the encompassive earth-based spatial grid, in particular, of its vertical orientation. Thus, **above requires recognizing three components within a spatial scene, a Figure, a Ground, and a Secondary Reference Object** of the encompassive type. (8) a. The lamp is near the TV. b. The lamp is above the TV. Comparably, the schema of past, as in (9a). only relates John as Figure to the border as Ground, An observer could felicitously say this sentence on viewing the event through binoculars from either side of the border. **But** (9b) with **the preposition beyond could be said only by an observer on the initial side of the border**, the side now opposite John. Hence, **the beyond schema establishes a perspective point at that location as a Secondary Reference Object** - in this case, one of the external type - in addition to its specifications for Figure and Ground. (9) a. John is past the border, b. **John is beyond the border.**

### Mesosphere is defined as 50 miles above Earth’s surface

**WC 11** (Weather Channel – Weather Glossary, “M”, <http://www.weather.com/glossary/m.html>)

MESOSPHERE

**The layer of the**[**atmosphere**](http://www.weather.com/glossary/a.html#atmo)**located between the**[**stratosphere**](http://www.weather.com/glossary/s.html#strato)**and the**[**ionosphere**](http://www.weather.com/glossary/i.html#iono)**, where**[**temperatures**](http://www.weather.com/glossary/t.html#temp)**drop rapidly with increasing height. It extends between 31 and 50 miles (17 to 80 kilometers) above the earth's surface.**

### Violation- The affirmative’s vague definition of “beyond” is is not defined as 50 miles from Earth’s surface

### Standards

### Limit- This allows the affirmative to manipulate, and explore from everywhere, excluding the mesosphere

### Ground- The affirmative’s aff destroys predictability. The negative is left ignorant of every possible definition of “beyond”. It also makes the debate unfair, because the negative is forced to research and insurmountable amount of definitions.

### This is a voter for fairness and education

## 1NC- Substantial – 50%

### A. Interpretation- Substantial means at least 50% increase

### Substantial increase, in the context of space, is 50%

Shifrin 1987 [Carole, Space Technology, “Soviets Consider Possible Mars Rover, Sample Return Missions”, Lexis]

Allen cited the space station science program and Earth and ocean sciences as areas in which there are sound programs that are not adequately budgeted. "It is clear that to do the sound plan that NASA already has, at a reasonable pace, would require a very substantial increase in the NASA budget, perhaps as much as 50%," he said. "But that seems somewhat unlikely, under the kind of budget pressures that existed in the past."

### B. Violation- The aff does not increase enough to be considered substantial as they do not increase the budget at 50% or more

### C. Standards

### 1. Neg ground- Under their interpretation the neg can’t link to any disadvantages because to the aff being small. Our interpretation allows for more comprehensive affs that have a strategy behind them.

### 2. Limits- Under the affs interpretation we could send any little thing into space under an incredibly low budget. The aff is so small it encompasses almost anything having to do with space and explodes the topic allowing infinite affs.

### 3. No Brightline- the affs interpretation is vague and makes it impossible to tell whether or not the plan is topical. Prefer our interpretation because it gives a specific quantifier as to why the aff is non-topical.

### D. Topicality is a voting issue for reasons of fairness and education.

## 2NC – Substantial = 50%

### Extend our interpretation that substantial means 50%

### This interpretation is good for debate because it makes it possible to have a clear view of whether or not a case is topical.

### It makes sure that the aff case is a large enough change to be relevant. While allowing a finite number of cases.

### They don’t meet our interpretation

### NASA is a huge national organization that has lots of spaced based projects, the aff is just a drop in the bucket compared to everything else and is not large or expensive enough to be considered a 50% increase.

### Standards

### Extend our neg ground argument- Under their interpretation we can’t get links to disadvantages because there is not a substantial amount of money invested in the plan, we can’t link to things like debris, because under the affs interpretation we could just be sending any one random thing into space which wouldn’t have an impact.

### Extend our limits argument- Under their interpretation anything having to do with space is topical and aff plans could so many cases that it would be impossible for the neg to research all of them. Under their interpretation we could do something like launch a baseball into space. Prefer our interpretation which allows for a reasonable, but finite number of cases.

### Extend our no brightline argument- because of their vague definition of substantial prevents anyone from being able to determine whether or not a case is topical.

## 1NC- Increase doesn’t = create

### Interpretation - Increase requires pre-existence

**Ripple, 87** (Circuit Judge, Emmlee K. Cameron, Plaintiff-Appellant, v. Frances Slocum Bank & Trust Company, State Automobile Insurance Association, and Glassley Agency of Whitley, Indiana, Defendants-Appellees, 824 F.2d 570; 1987 U.S. App. LEXIS 9816, 9/24, lexis)

Also related to the waiver issue is appellees' defense relying on a provision of the insurance policy that suspends coverage where the risk is increased by any means within the knowledge or control of the insured. However, the term "increase" connotes change. To show change, appellees would have been required to present evidence of the condition of the building at the time the policy was issued. See 5 J. Appleman & J. Appleman, Insurance Law and Practice, § 2941 at 4-5 (1970). Because no such evidence was presented, this court cannot determine, on this record, whether the risk has, in fact, been increased. Indeed, the answer to this question may depend on Mr. Glassley's knowledge of the condition of the building at the time the policy was issued, see 17 J. Appleman & J. Appleman, Insurance Law and Practice, § 9602 at 515-16 (1981), since the fundamental issue is whether the appellees contemplated insuring the risk which incurred the loss.

### This means that the affirmative cannot topically create a new program.

###  Violation – plan doesn’t increase, they create. They create a new program that hasn’t existed before.

### Standards-

### Predictable limits – history should limit the topic- we limit debate to current space policy, there is not aff and neg literature on hypotheticals. We should limit the topic to an area where literature exists on both sides.

### Ground- There is no literature for our off case args because no one has written against things that haven’t been tried yet. So there is no possible way we can research the topic and be well prepared.

### T is a voter for fairness and education, it is critical to check abuse and preserve the integrity of debate.

## 2NC- Increase doesn’t = create

### Ext. our Interpretation - Increase requires pre-existence Ripple, 87 something has to have a physical condition and exist to increase

### Standards-

### Predictable limits –We should limit the topic to an area where literature exists on both sides. The neg’s def provides a more widely understood def of the word increase, since we have a distinction in the words “increase” and “create” in the real world. The fact that they make any programs topical that are exploring beyond the Earth’s mesosphere means that the aff could literally create an asteroid stopping space society, create purple space stations to explore the moon.

### Ground- This means that the neg would have to have access to literature on anything theoretical they could come up with to develop and/ or explore beyond the Earth’s mesosphere. The aff abuse has already happened, it happened when we weren’t able to get links to our spending DA.

### T is a voter for-

### Fairness- By limiting the topic to a predictable increase, the neg allows for both the aff and the neg to have a fair debate. If they can create their own concept for space, the neg would not only be “kept on their toes” they would be off the ground, literally. If we can’t have predictability, the neg ground is stolen right out from under them, allowing the aff to get away with tons of abuse.

### Education - This search for the best policy option and use of the neg interpretation leads to specific education in the most relevant areas of the topic, increasing education.

### Reasonability – reasonability is arbitrary, competing interpretations allows us to evaluate the best option, rather than determine if something is just “acceptable.”

## 1NC – “Its” Excludes International

### A. Interpretation- OUR INTERPRETATION IS THAT “ITS” REFERS TO THE USFG, WHICH MEANS THE SPACE DEVELOPMENT AND EXPLORATION MUST BE POSSESSED BY THE USFG.

### Grammatically, this refers solely to U.S. activities

Manderino 73 (Justice – Supreme Court of Pennsylvania, “Sigal, Appellant, v. Manufacturers Light and Heat Co”., No. 26, Jan. T., 1972, Supreme Court of Pennsylvania, 450 Pa. 228; 299 A.2d 646; 1973 Pa. LEXIS 600; 44 Oil & Gas Rep. 214, Lexis)

On its face, the written instrument granting easement rights in this case is ambiguous. The same sentence which refers to the right to lay a 14 inch pipeline (singular) has a later reference to "said lines" (plural). The use of the plural "lines" makes no sense because the only previous reference has been to a "line" (singular). The writing is additionally ambiguous because other key words which are "also may change the size of its pipes" are dangling in that the possessive pronoun "its" before the word "pipes" does not have any subject preceding, to which the possessive pronoun refers. The dangling phrase is the beginning of a sentence, the first word of which does not begin with a capital letter as is customary in normal English [\*\*\*10]  usage. Immediately preceding the "sentence" which does not begin with a capital letter, there appears a dangling  [\*236]  semicolon which makes no sense at the beginning of a sentence and can hardly relate to the preceding sentence which is already properly punctuated by a closing period. The above deviations from accepted grammatical usage make difficult, if not impossible, a clear understanding of the words used or the intention of the parties. This is particularly true concerning the meaning of a disputed phrase in the instrument which states that the grantee is to pay damages from ". . . the relaying, maintaining and operating said pipeline. . . ." The instrument is ambiguous as to what the words ". . . relaying . . . said pipeline . . ." were intended to mean.

### And --- its IS a term of exclusion

Frey 28 (Judge – Supreme Court of Missouri, Supreme Court of Missouri,

320 Mo. 1058; 10 S.W.2d 47; 1928 Mo. LEXIS 834, Lexis)

In support of this contention appellant again argues that when any ambiguity exists in a will it is the duty of the court to construe the will under guidance of the presumption that the testatrix intended her property to go to her next of kin, unless there is a strong intention to the contrary. Again we say, there is intrinsic proof of a  [\*1074]  strong intention to the contrary. In the first place, testatrix only named two of her blood relatives in the will and had she desired [\*\*\*37]  them to take the residuary estate she doubtless would have mentioned them by name in the residuary clause. In the second place, if she used the word "heirs" in the sense of blood relatives she certainly would have dispelled all ambiguity by stating whose blood relatives were intended. Not only had  [\*\*53]  she taken pains in the will to identify her own two blood relatives but she had also identified certain blood relatives of her deceased husband. Had it been her intention to vest the residuary estate in her blood relatives solely, she would certainly have used the possessive pronoun "my" instead of the indefinite article "the" in the clause, "the above heirs."its is geographical

### B. Violation- The plan text of the affirmative includes the exploration and development of another country’s space program as well.

### C. Standards

### 1. LIMITS- ALLOWING THE AFFIRMATIVE TO RUN PLANS THAT ARE NOT WITHIN THE GROUNDS OF THE RESOLUTION RESULTS IN THE EXPLOSION OF AFFS LIKE ZIMBABWE OR NEW ZEALAND COOP. THIS EXPLODES THE NEG GROUND MAKING NEG RESEARCH IMPOSSIBLE.

### 2. PREDICTABLE GROUND- THE USFG IS THE ONLY THING THE NEG KNOWS THE AFF PLAN WILL DO FOR SURE. IF THEY ARE ALLOWED TO INCLUDE OTHER COUTRIES THIS LEADS TO COMPLETELY UNPREDICTABLE AFFS THAT THE NEG CAN NEVER BE PREPARED FOR. WHEN THE AFF CAN USE INTERNATIONAL ACTORS, THEY STEAL NEG GROUND LIKE CP’S.

### 3. DESTROYS GRAMMAR- BECAUSE THEY ARE INCLUDING ANOTHER COUNTRY, IT MEANS THEY ARE DISREGARDING THE “USFG” PART OF THE RESOLUTION. AND AS OUR MANDERINO CARDS SAYS IF THERE IS NOT A NOUN BEFORE “ITS” THAN IT IS NOT GRAMMATICALLY CORRECT. THIS LOWERS EDUCATION. AND LOSS OF GRAMMAR ALSO LOWERS PRECISION, WHICH RESULTS IN LESS PREDICTABILITY.

### D. This is a voter for fairness and education.

## 2NC – “Its” excludes International

### A. Prefer our interpretation: the space exploration and development has to be American and cannot include international actors. Prefer our interp because it comes from the Supreme Court of Pennsylvania and Missouri two very credible sources.

### C. Standards:

### Limits: We do not limit aff ground. We still allow for EVERY other aff such as SPS, constellation, and asteroids. All we do is make the limits fair for both the aff and neg. A topical version would be to claim good relations as advantage, not fiat it.

### Predictable: Do not let the aff say that they are predictable. The resolution clearly says “ITS” space exploration and development, not another countries’. Also do not let them claim that they are increasing education because depth is better than breadth. Depth is better than breadth because it is better to know a lot about a few things than to know literally one or two facts about a lot of random things. Also they hurt neg fairness because by running affs that don’t abide by the resolution they make neg research.

### They also steal major neg ground by taking away the international actors CP’s.

### Grammar: They take away the educational value of the round by inferring incorrect grammar. Also by using incorrect grammar they are reducing precision, which results in unpredictability.

### This is a voter for fairness and education.

## 1NC “Its” excludes Private Sector

### Interpretation: Its means all exploration and development must be done by the federal government.

### ‘Its’ is possessive

English Grammar 5 (Glossary of English Grammar Terms, <http://www.usingenglish.com/glossary/possessive-pronoun.html>)

Mine, yours, his, hers, its, ours, theirs are the possessive [pronouns](http://www.usingenglish.com/glossary/pronoun.html) used to substitute a [noun](http://www.usingenglish.com/glossary/noun.html) and to show possession or ownership. EG. This is your disk and that's mine. (Mine substitutes the word disk and shows that it belongs to me.)

### Violation: The Affirmative uses private companies to implement the plan—not topical

### Private contractors are distinct from the federal government

 **Barbier 7** (Carl, US District Judge, TIEN VAN COA, ET AL VERSUS GREGORY WILSON, ET AL CIVIL ACTION NO: 07-7464 SECTION: J(1) UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF LOUISIANA 2007 U.S. Dist. LEXIS 87653)

However, in their motion to remand, Plaintiffs argue that as an *independent contractor,* P&J is not an employee of the federal government, and consequently does not enjoy derivative immunity and cannot invoke the FTCA. Plaintiffs cite United States v. New Mexico in support of the notion that private contractors, whether prime or subcontractors, are not government employees nor are they agents of the federal government. [455 U.S. 720, 102 S. Ct. 1373, 71 L. Ed. 2d 580 (1982)](http://www.lexisnexis.com.proxy.uchicago.edu/lnacui2api/mungo/lexseestat.do?bct=A&risb=21_T10427521803&homeCsi=6323&A=0.4336064238087415&urlEnc=ISO-8859-1&&citeString=455%20U.S.%20720&countryCode=USA). According to the Court, "[t]he congruence of professional interests between the contractors and the Federal Government is not complete" because "the contractors remained distinct entities pursuing private ends, and their actions remained  [\*4] commercial activities carried on for profit." [Id. at 740](http://www.lexisnexis.com.proxy.uchicago.edu/lnacui2api/mungo/lexseestat.do?bct=A&risb=21_T10427521803&homeCsi=6323&A=0.4336064238087415&urlEnc=ISO-8859-1&&citeString=455%20U.S.%20720,%20740&countryCode=USA); see

also[Powell v. U.S. Cartridge Co., 339 U.S. 497, 70 S. Ct. 755, 94 L. Ed. 1017 (1950)](http://www.lexisnexis.com.proxy.uchicago.edu/lnacui2api/mungo/lexseestat.do?bct=A&risb=21_T10427521803&homeCsi=6323&A=0.4336064238087415&urlEnc=ISO-8859-1&&citeString=339%20U.S.%20497&countryCode=USA).

### Standards:

### Limits—a strict interpretation of “it’s” prevents explosion of the topic. They would allow anyone working with the government, like China or Google, to be topical, which is unpredictable.

### Ground—Private actors and international organizations are CP ground. The aff doesn’t test whether the USFG should implement or not.

### Extra-t—even if they include things that the gov’t owns, they have other actors to put things in space.

### Voters for education and fairness.

## 2NC – “Its” Excludes Private Sector

### If limits aren’t in place, affs such as:

### The Google competition

### US with GM, Coca-Cola, Hasbro, Apple, Android, Wal-Mart, etc.

### The negative should not have to be prepared to debate all of these types of affs.

### AND WE DON’T OVERLIMIT, there are multiple cases the aff can run—Project Constellation, etc.

### Nasa does tons of missions – limits are especially important on this topic

NASA 10[National Aeronautics and Space Administration, “About NASA” <http://www.nasa.gov/about/highlights/what_does_nasa_do.html>, 2/1/10]

NASA Today NASA conducts its work in four principal organizations, called mission directorates: Aeronautics: pioneers and proves new flight technologies that improve our ability to explore and which have practical applications on Earth. Exploration Systems: creates capabilities for sustainable human and robotic exploration. Science: explores the Earth, solar system and universe beyond; charts the best route of discovery; and reaps the benefits of Earth and space exploration for society. Space Operations: provides critical enabling technologies for much of the rest of NASA through the space shuttle, the International Space Station and flight support. In the early 21st century, NASA's reach spans the universe. Spirit and Opportunity, the Mars Exploration Rovers, are still studying Mars after arriving in 2004. Cassini is in orbit around Saturn. The restored Hubble Space Telescope continues to explore the deepest reaches of the cosmos. Closer to home, the latest crew of the International Space Station is extending the permanent human presence in space. Earth Science satellites are sending back unprecedented data on Earth's oceans, climate and other features. NASA's aeronautics team is working with other government organizations, universities, and industry to fundamentally improve the air transportation experience and retain our nation's leadership in global aviation. The Future NASA is making significant and sustained investments in: Transformative technology development and demonstrations to pursue new approaches to space exploration, including heavy-lift technologies; Robotic precursor missions to multiple destinations in the solar system; U.S. commercial spaceflight capabilities; Extensions and increased utilization of the International Space Station; Cross-cutting technology development in a new Space Technology Program; Climate change research and observations; NextGen and green aviation; and Education, including focus on Science, Technology, Engineering and Math (STEM).

### Studies prove – depth is better than breadth.

**Arrington ‘9** (Rebecca, UVA Today, “Study Finds That Students Benefit From Depth, Rather Than Breadth, in High School Science Courses” March 4)

A recent study reports that high school students who study fewer science topics, but study them in greater depth, have an advantage in college science classes over their peers who study more topics and spend less time on each. Robert Tai, associate professor at the University of Virginia's Curry School of Education, worked with Marc S. Schwartz of the University of Texas at Arlington and Philip M. Sadler and Gerhard Sonnert of the Harvard-Smithsonian Center for Astrophysics to conduct the study and produce the report. "Depth Versus Breadth: How Content Coverage in High School Courses Relates to Later Success in College Science Coursework" relates the amount of content covered on a particular topic in high school classes with students' performance in college-level science classes. The study will appear in the July 2009 print edition of Science Education and is currently available as an online pre-print from the journal. "As a former high school teacher, I always worried about whether it was better to teach less in greater depth or more with no real depth. This study offers evidence that teaching fewer topics in greater depth is a better way to prepare students for success in college science," Tai said. "These results are based on the performance of thousands of college science students from across the United States." The 8,310 students in the study were enrolled in introductory biology, chemistry or physics in randomly selected four-year colleges and universities. Those who spent one month or more studying one major topic in-depth in high school earned higher grades in college science than their peers who studied more topics in the same period of time. The study revealed that students in courses that focused on mastering a particular topic were impacted twice as much as those in courses that touched on every major topic.

### Voters for education and fairness—

### Education is increased tenfold by limiting the aff to predictable plans, and the purpose of debate is to increase education. If the aff is decreasing education, the purpose of debate is ruined.

### Predictable limitation is the only way to ensure fairness for the neg., especially with the infinite prep time the aff receives.

## 1NC - Space Exploration must be Physical

### A: Interpretation - “Space Exploration” is the physical traveling to areas in space.

Columbia Encyclopedia 8 "space exploration." The Columbia Encyclopedia, Sixth Edition. 2008. Encyclopedia.com. 9 May. 2011 <http://www.encyclopedia.com>.

<http://www.encyclopedia.com/topic/space_exploration.aspx>

 With over 51,000 entries The Columbia Encyclopedia (Sixth Edition) is an authoritative and exhaustive reference guide. Each entry is thorough and clear, the result of over 200 editors and academic advisors striving for depth and accuracy in the oldest, most venerable English language encyclopedia in the world. space exploration the investigation of physical conditions in space and on stars, planets, and other celestial bodies through the use of artificial satellites (spacecraft that orbit the earth), space probes (spacecraft that pass through the solar system and that may or may not orbit another celestial body), and spacecraft with human crews. Satellites and Probes Although studies from earth using optical and radio telescopes had accumulated much data on the nature of celestial bodies, it was not until after World War II that the development of powerful rockets made direct space exploration a technological possibility. The first artificial satellite, Sputnik I, was launched by the USSR (now Russia) on Oct. 4, 1957, and spurred the dormant U.S. program into action, leading to an international competition popularly known as the "space race." Explorer I, the first American satellite, was launched on Jan. 31, 1958. Although earth-orbiting satellites have by far accounted for the great majority of launches in the space program, even more information on the moon, other planets, and the sun has been acquired by space probes.

### B: Violation – The Affirmative doesn’t actually “explore” they need to physically be there

### C: Standards –

**1 - Limits:** We need to limit the topic to physical exploration of space, if we don’t do this then other affs can claim that looking through a telescope, this allows for affirmatives that just deploy a telescope to look at the moon. You can “explore” your room by looking at it!

**2 – Ground**: Major neg ground steal, we can never predict what exploration will mean round-to-round and whether or not we actually travel somewhere. We lose links on DA’s that rely on the perception of actually touching space

**3 – Education**: Without physically exploring space we can’t really understand the question of whether or not we should explore it, we need to know if human expansion in space is a good idea – Key to Topic Education.

### D: Topicality is a Voter –

* Fairness: Need T to check unpredictable affs
* Education: Need T to make sure affs stay on Topic, otherwise there is not point to having a resolution
* Competing Interpretations: Without this it is up to the judge and judge only on whether or not the aff is “topical”. Need to compare our interpretations to make us logically understand who’s interpretation is better.

## **2NC – Space Ex must be physical Space**

**A: Prefer our Interpretation: Our interpretation is that the aff must PHYSICALLY explore space. Meaning that instead of looking through telescopes to see parts of space we must actually GO there.**

* Limits: Affs that just let random telescopes look at space and be considered “exploration” is neither physical or human. You would never interpret “Exploring Mt.Everest” as just starting at its picture on Google, this doesn’t make any sense.
* Ground: Neg loses HUGE ground in this debate, without humans being sent to space we can’t link with Perception DA’s, the most important DA’s on the topic because they consider International Relations and how this space expansion would affect this.
* Education: Aff can’t claim we take education when we can’t even get links to DA reliant on a human presence in space, we actually learn something about the impact of human expansion into space .

### T is a voter:

* + Fairness: is the biggest reason to vote on T, especially on an Aff that doesnnt even put anything into space! Vote fairness on above reasons of limits and ground, without these aff will win every debate.
	+ Competing Interpretations: DO NOT BUY this reasonability argument, their interpretation is NOT REASONABLE, if you allow reasonability over competing interps then you vote on letting the judge choose who wins every round without considering other issues.

## 1NC - SETI is not Space Expo

### A: Interpretation – “Space Exploration” is the physical traveling to areas in space.

Columbia Encyclopedia 8 "space exploration." The Columbia Encyclopedia, Sixth Edition. 2008. Encyclopedia.com. 9 May. 2011 <http://www.encyclopedia.com>.

<http://www.encyclopedia.com/topic/space_exploration.aspx>

 With over 51,000 entries The Columbia Encyclopedia (Sixth Edition) is an authoritative and exhaustive reference guide. Each entry is thorough and clear, the result of over 200 editors and academic advisors striving for depth and accuracy in the oldest, most venerable English language encyclopedia in the world. space exploration the investigation of physical conditions in space and on stars, planets, and other celestial bodies through the use of artificial satellites (spacecraft that orbit the earth), space probes (spacecraft that pass through the solar system and that may or may not orbit another celestial body), and spacecraft with human crews. Satellites and Probes Although studies from earth using optical and radio telescopes had accumulated much data on the nature of celestial bodies, it was not until after World War II that the development of powerful rockets made direct space exploration a technological possibility. The first artificial satellite, Sputnik I, was launched by the USSR (now Russia) on Oct. 4, 1957, and spurred the dormant U.S. program into action, leading to an international competition popularly known as the "space race." Explorer I, the first American satellite, was launched on Jan. 31, 1958. Although earth-orbiting satellites have by far accounted for the great majority of launches in the space program, even more information on the moon, other planets, and the sun has been acquired by space probes.

### B: Violation – Affirmative classifies SETI as space exploration, space exploration is specifically NOT SETI

Lyall 98 Professor of Public Law. Member IISL. University of Abderdeen Acta Astronautica, Volume 42, Issues 10-12, May-June 1998, Pages 661-665

 Under the general concept of state sovereignty it is for a state to regulate what is done within its jurisdiction. On that basis it is for municipal law to determine the lawfulness of SETI activity, and, for its own purposes to regulate what is done. Passive SETI, if I may so call the simple reception and analysis of signals, could be classified as a matter lying wholly within the jurisdiction of a state. Can one argue that it is an activity in outer space, which is the gravamen of the UN treaties? I think not. However, one could say that it crawls into the international arrangements as being part of the “exploration” of space which is dealt with internationally. However, if that is the case then visual astronomy must also qualify. Certainly astronomy has an interest, for space debris, not to mention space art, can affect astronomers. I would not consider this enough to sweep astronomy into the activities subject to the Outer Space Treaty.

### C: Standards -

### 1 - Limits: Under the affirmative interpretation they justify affirmatives like “Give Timmy a Telescope to look at the Moon” ….you can’t just explore Mt.Everest by looking at it on Google

### 2 – Ground: When the aff can just put something on the ground to LOOK into space we lose major ground like Space Debris and Space Mil DA’s.

### 3 – Education: We don’t really learn anything when the aff just funds a land-based telescope that doesn’t really change when its funded, basically the aff isn’t changing any function just saying how awesome things are currently.

### D: Topicality is a Voter –

### Fairness: Need T to check unpredictable affs

### Education: Need T to make sure affs stay on Topic, otherwise there is not point to having a resolution

### Competing Interpretations: Without this it is up to the judge and judge only on whether or not the aff is “topical”. Need to compare our interpretations to make us logically understand who’s interpretation is better.

## **2NC SETI is excluded**

**A: Prefer our Interpretation:** Our interpretation is that affs must physically be exploring space, not through telescopes. This allows for the most aff and neg ground and allows for EVERY other major affs, SPS, He3, Colonization

* Limits: We need to limit out affirmatives like the 1AC where the aff merely fund something on earth and doesn’t actually GO to space. Under the affirmatives interp we can do anything that has anything to do with space and it would be consider Topical.
* Ground: If you think neg still has ground under aff interp your wrong, we basically get generic DA’s and CP’s. The affs interp takes away EVERY DA DEALING WITH SPACE. How can you say we steal aff ground when we already have none.
* Education: We win this argument, the aff doesn’t really change anything IN space. They just want to look at the sky, this is exactly why their interpretation is inherently NOT educational. How can you say “exploration” is the same as “looking”.

### T is a voter:

* + Fairness: is the biggest reason to vote on T, especially on an Aff that doesnnt even put anything into space! Vote fairness on above reasons of limits and ground, without these aff will win every debate.
	+ Competing Interpretations: DO NOT BUY this reasonability argument, their interpretation is NOT REASONABLE, if you allow reasonability over competing interps then you vote on letting the judge choose who wins every round without considering other issues.

## **1NC - Space Exploration Must Be Humans**

### A: Interpretation – Space Exploration must include physical exploration by People

Faith 8/31/9 <http://www.thespacereview.com/article/1456/1> “ Giving NASA a clear mission “ G. Ryan Faith is an adjunct fellow at the Center for Strategic and International Studies (CSIS).

 Giving NASA a clear mission If neither technology-oriented nor destination-oriented objectives seem able to provide a sense of direction to guide the nation’s efforts in space, then what can? To approach this question, it is useful to ask why President Kennedy’s challenge to go to the Moon was so effective in providing NASA with leadership. The critical element of this challenge that, although never explicit, was so important to NASA’s health and growth during this period was the transformation—at least in fact, if not in law—into an exploration agency. If we wish to see NASA act effectively as a space exploration agency, then the most direct way to do this is to amend the Space Act to explicitly task the agency with the job of space exploration. However, before we do so, we must define what space exploration actually is. Space exploration is the expansion of human influence in space. This definition of exploration is inherently one of capacity building. Human influence in space is a measure of our ability to do useful things beyond the Earth’s surface. In order to do something useful, there has to be some sort of human presence, either humans themselves or their robotic proxies. Once some measure of human influence has been established at some destination in space, there are two ways a space exploration agency can expand that influence. One, the agency can decrease the costs and increase the benefits of human influence at a given location until such influence becomes sufficiently useful that it is economically self-sustaining, at which point continued use of agency resources is unnecessary. Alternately, human influence can be extended to some new place that may in future become home to some form of self-supporting human influence. The key element is that such a mandate compels each step to build on past accomplishments and lay the groundwork for future missions.

### B: Violation – Affirmative doesn’t use humans in their exploration

Logsdon 9 <http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20100025875_2010028362.pdf> Dr. Logsdon is Professor Emeritus of Political Science and International Affairs at George Washington University’s Elliott School of International Affairs. Prior to his leaving active faculty status in June 2008, he was on the faculty of the George Washington University for 38 years; before that he taught at the Catholic University of America for four years. He was the founder in 1987 and long-time Director of GW’s Space Policy Institute. From 1983-2001, he was also Director of the School’s Center for International Science and Technology Policy. He is also a faculty member of the International Space University. During the 2007-2008 academic year, he was a Distinguished Visiting Professor at MIT’s Science, Technology and Society Program on a part-time basis. He holds a B.S. in Physics from Xavier University (1960) and a Ph.D. in Political Science from New York University (1970).

 Many believe that the only sustainable rationale for a government-funded program of human spaceflight is to take the lead in exploring the solar system beyond low-Earth orbit.20 The MIT white paper provides an insightful definition of exploration: Exploration is a human activity, undertaken by certain cultures at certain times for particular reasons. It has components of national interest, scientific research, and technical innovation, but is defined by none of them. We define exploration as an expansion of the realm of human experience, bringing people into new places, situations, and environments, expanding and redefining what it means to be human. What is the role of Earth in human life? Is human life fundamentally tied to the earth, or could it survive without the planet? Human presence, and its attendant risk, turns a spaceflight into a story that is compelling to large numbers of people. Exploration also has a moral dimension because it is in effect a cultural conversation on the nature and meaning of human life. Exploration by this definition can only be accomplished by direct human presence and may be deemed worthy of the risk of human life.21 In the wake of the 2003 Columbia accident that took the lives of seven astronauts and the report of the Columbia Accident Investigation Board that criticized the absence of a compelling mission for human spaceflight as “a failure of national leadership,”22 the United States, in January 2004, adopted a new policy to guide its human spaceflight activities. The policy directed NASA to “implement a sustained and affordable human and robotic program to explore the solar system and beyond” and to “extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations.”23 This policy seems totally consistent with the definition of exploration provided in the MIT white paper.

### C: Standards -

**1 - Limits:** Under the aff’s interpretations we can send 1 probe out into space and call it topical, this allows for miniscule affirmatives, you won’t be able to “explore” something without going there yourself

**2 – Ground**: When the aff is allowed to look at space with robots it moots Neg links, we need all exploration to be done by humans or we lose perception DA’s that are key to the topic

**3 – Education**: When we don’t send humans we don’t learn about the effect we physically have on the universe, this is key to topic education

### D: Topicality is a Voter –

* Fairness: Need T to check unpredictable affs
* Education: Need T to make sure affs stay on Topic, otherwise there is not point to having a resolution
* Competing Interpretations: Without this it is up to the judge and judge only on whether or not the aff is “topical”. Need to compare our interpretations to make us logically understand who’s interpretation is better.

## **2NC Space Ex must be humans**

**A: Prefer our Interpretation:** Our interpretation is that affs must use Humans to physically go into space and explore, otherwise the aff can be anything about space. We still allow for the biggest affs on the topic, Moon Mining and Colonization

* Limits: Affs that just let random telescopes look at space and be considered “exploration” is neither physical or human. You would never interpret “Exploring Mt.Everest” as just starting at its picture on Google, this doesn’t make any sense. We need to go there as humans physically for this to be considered exploration.
* Ground: Neg loses HUGE ground in this debate, without humans being sent to space we can’t link with Perception DA’s, the most important DA’s on the topic because they consider International Relations and how this space expansion would affect this.
* Education: Aff can’t claim we take education when we can’t even get links to DA reliant on a human presence in space, we actually learn something about the impact of human expansion into space .

### T is a voter:

* + Fairness: is the biggest reason to vote on T, especially on an Aff that doesnnt even put anything into space! Vote fairness on above reasons of limits and ground, without these aff will win every debate.
	+ Competing Interpretations: DO NOT BUY this reasonability argument, their interpretation is NOT REASONABLE, if you allow reasonability over competing interps then you vote on letting the judge choose who wins every round without considering other issues.

## 1NC - Space Exploration – Deep Space

### A: Interpretations - Must explore past Earth’s Orbit with Humans

nasa.gov 6/16

Lind, Rocky, and Sarah Loff. "NASA - Human Space Exploration." *NASA - Home*. 16 June 2011. Web. 23 June 2011. <http://www.nasa.gov/exploration/home/index.html>. mes

This is the beginning of a new era in space exploration where we will build the capabilities to send humans deeper into space than ever before.

### **B: Violation – Affirmative just puts something into orbit around the Earth, this isn’t exploration**

Harrison Schmitt, 2003 Chairman Of Interlune-Intermars Initiative Astronaut before the Senate Commerce, Science, and Transportation Committee's Subcommittee on Science ,“Testimony on the Commercial Development of Lunar Resources”, 2003

The term "space exploration" implies the exploration of the Moon, planets and asteroids, that is, "deep space," in contrast to continuing human activities in Earth orbit. Human activities in Earth orbit have less to do with exploration and more to do with international commitments, as in the case of the Space Station, and prestige and technological development, as in the case of China and Russia. There are also research opportunities, not fully recognized even after 40 years, that exploit the opportunities presented by being in Earth orbit.

### C: Standards –

**1 - Limits:** If we don’t make affs go past Earth’s orbit it allows for crazy affs that may only put a telescope in low-earth orbit or a weather balloon aff.

**2 – Ground**: We lose all our DA’s, every DA relies on putting something up past the Earth’s orbit, their interpretation doesn’t allow for this.

**3 – Education**: If we don’t actually go past the Earth’s orbit we aren’t actually in space – this ios literally the most important educational aspect of the entire resolution. We must be in space!

### D: Topicality is a Voter –

* Fairness: Need T to check unpredictable affs
* Education: Need T to make sure affs stay on Topic, otherwise there is not point to having a resolution
* Competing Interpretations: Without this it is up to the judge and judge only on whether or not the aff is “topical”. Need to compare our interpretations to make us logically understand who’s interpretation is better.

## 2NC A2 Reasonability

This is just like saying “we’re almost topical” THIS IS NOT FAIR. Makes sure neg loses every T debate when aff need only say their interp is reasonable, which just means the judge chooses

### Reasonability as an answer is bad

Kupferbreg (Eric, 1987 - Latin American Politics: The Calculus of Instability, ),

University of Kentucky “Limits the Essence of Topicality”

Resolutions themselves began to change with these changes in perspective, and soon many of them could not be rationally or intellectually defended in the abstract "The United States should significantly increase its foreign military commitments" and "The United States should significantly change its foreign trade policy" being two recent examples. The number of plans broadened with these broader topics, as did the number of proposals defended that were of tangential or tenuous relationship to the resolution. Such plans, charmingly dubbed "squirrels," raised the blood pressure of many negative debaters, spurring them to challenge the connection between plan and resolution. Often these challenges sprang from a dearth of other salient arguments, but equally often there was a valid question to be asked. Unfortunately, in the early days of the topicality boom, it was all too easy for affirmatives to postulate their frequently bizarre definitions, and blithely dismiss negative objections to them with the incantation, "We need only be reasonable:"

## 1NC Space development = Human Colonization

### Interpretation- Space development is the expanding of human civilization to other plants, and the development of an interstellar space flight capabilities.

### Space development means expanding human civilization

I A Crawford 1995 based at the Department of Physics and Astronomy, University Col- lege London, Gower Street, London, UK, Space development: social and political implications SPACE POLICY November 1995 219

In this essay I wish to explore some of the social and political issues likely to lie behind any large-scale future programme of space exploration and development. For the purposes of this discussion, I intend 'large-scale' to mean a programme of space development on a scale sufficient to make possible, over the next few centuries, the economic utilisation of the Solar System, the colonisation of other planets, and, eventually, the development of an interstellar spaceflight capability. I am aware that many self-styled 'realists' will react against such an apparently utopian agenda but it seems to me that something along these lines must be the ultimate aim of any meaningful future human space programme. After all, we already have most of what we need for satellite communications, earth resource surveys, and space astronomy, so discussion of major new technical and institutional initiatives makes sense only if we acknowledge that the ultimate aim of space development is something much more ambitious - the expansion of human civilisation into the Solar System and beyond.

**Violation- The aff does not expand human civilization to other planets.**

**Reasons to prefer-**

1. **Predictable limits- Our interpretation limits the topic to affs that only expand to other planets. This is better because then there is no question on any other word in the resolution. Their interp allows for anything that goes beyond the mesosphere.**
2. **Neg ground- Under their interp the neg isn’t able to run specific case arguments because we cannot predict their aff. We can’t get links to things like colonization, frontier K, and exploration. They just claim doing “stuff” in space.**

**Voters- T is a voter for education and fairness. Competing interpretations should be the lens in which you evaluate topicality, because it is more objective.**

## 2NC Space development = Human Colonization

### Extend our Interpretation- Space development is the expanding of human civilization to other planets, which means that the aff must colonize a planet other than earth to be topical, and the development of an interstellar space flight capabilities, which means being able to fly between stars.

**Reasons to prefer-**

1. **Extend Predictable limits- creates clash in the round. Because, when we are ready for the arguments that they will run, we can have a more in depth debate then we would if we had no idea what arguments would arise in the round.**
2. **Extend Neg Ground- Under their interpretation we are unable to get links to things like the frontier K, or colonization bad. Their definition is extremely vague. This explodes the negs research burden, because we now have to defend ANYTHING in space beyond the mesosphere.**

**Topicality is a voting issue for education and fairness. We increase both of those the most because of in depth the debates- that’s education. And because of a fair and even research burden- that’s fairness.**

## 1NC Development = Commercial Space

### Interpretation- Space development is the expansion of commercial space projects as well as a substantial increase, that is at least 7% of NASA’s budget.

### Space development is expansion of commercial space projects

Eric Westling, guest on the space show 9/11/07, http://www.thespaceshow.com/guest.asp?q=298//jchen

Eric Westling is a science writer, pundit on science, technology, and economics. He is the co-author of "The Space Elevator” with Dr. Brad Edwards . In addition, Mr. Westling is retired and is a former Army officer and helicopter pilot, civilian Airline Transport Pilot (ATP), former consultant to many small companies regarding engineering, computer, and business troubleshooting. His most recent papers are on Solar Power Satellites, Economics of the Space Elevator, Energy and time lag in the 21st century , and Eric’s axioms (a list of principles of science, technology and economics). Mr. Westling stats that “Space Development is the only long term answer to the, just starting, energy shortage; which will otherwise continue until we have an economic collapse.” He believes that no-one is doing space development . Instead, we have space technology, not development. NASA has no TRL 10 – therefore no plans to develop space . He defines space development as the rapid expansion of manned commercial projects in space.

### A substantial increase in Nasa Budget Is 7%

**Alexander 07**

[Amir Alexander, Writer for the Planetary Society, “ NASA Mars Program Threatened by Senate Funding Bill” <http://planetary.org/news/2007/0703_NASA_Mars_Program_Threatened_by_Senate.html> July 3rd, 2007

Note: I had to do math for the percentage]

The Senate bill proposes these severe cuts to the Mars program despite the fact that overall it provides for a substantial increase in NASA funding. If approved, the bill will allocate NASA a total of $17.46 billion, $1.2 billion more than the agency’s 2007 budget, and $150 million more than the administration’s request for 2008. The proposal was crafted by the Senate Subcommittee on Commerce, Justice, and Science, and cleared the Senate Appropriations Committee on June 28, 2007.

### Violation- The aff does not expand commercial space projects, nor is it substantial in increasing NASAs budget by 7%.

### Reasons to prefer-

### A. Predictable limits- Inclusion of monuments explodes the limits of the topic. Our interp creates clash, increasing education. It’s better for us to focus on a fewer number of affs that we could learn a lot about, rather than having a superficial overview of lots of affs.

### B. Neg ground- Our interpretation has the best division of ground, because we allow a fair amount of affs. Theirs allows for an aff putting floss on the moon, which is not substantial. We can never get links on Ks, or Politics, because they don’t assume putting a monument in space exploding the research burden.

### Voters- Topicality is a voter for fairness and education. Competing interpretations should be the lens in which you evaluate topicality, because it is more objective.

## 2NC Development = Commercial Space

### Extend our interpretation- Space development is the expansion of commercial space projects, which means that a monument would not be development. Commercial space projects imply not by the federal government. And, even if they are development, they aren’t substantial. Substantial must be a 7% increase of NASA’s current budget.

### In the context of USFG space policy development is commercial. Prefer our evidence it provides a substantial caselist based on empirical examples.

Eligar Sadeh 2002 Assistant Professor in the Department of Space Studies at the University of North Dakota where he directs the Space Policy track for the Department. Sadeh also serves as a Research Associate with the Space Policy Institute at George Washington University. Dr Sadeh has developed graduate level courses in Space Politics and Policy, Public Administration of Space Technology, Space Law, and Space and the Environment. Eligar Sadeh is President of Astroconsulting International and Editor of the journal Astropolitics: The International Journal of Space Politics and Policy Space politics and policy: an evolutionary perspective (Google eBook) p 213-4

EVOLUTION OF COMMERCIAL SPACE POLICY Policy statements encouraging commercial space development began appearing in the Carter Administration, but the first real attempts at a comprehensive US government policy toward space commerce came in the 1980s. This was driven by technology maturation, market demand for satellite communications and launch services, and expectations of profits in new areas such as remote sensing and materials processing. Policies addressing different segments of the commercial space sector have already been discussed, but the Reagan Administration's 1988 National Space Policy was the first presidential directive to recognize space commerce as a distinct sector of space activity and to establish guidelines for supporting it. The Bush (89) and Clinton Administrations later adopted much of the same wording, with minor embellishments. The essential elements of presidential guidance since the late 1980s direct the US government to: support and enhance US economic competitiveness in space activities; purchase commercially available space goods and services to the fullest extent feasible; refrain from activities with commercial applications that preclude or deter commercial space activities, except for reasons of national security or public safety; pursue commercial space objectives without the use of direct federal subsidies; supervise or regulate commercial space activities only to the extent required by law, national security, international obligations, and public safety; facilitate commercial-sector access to US government space-related hardware, facilities, and data; enter into appropriate cooperative agreements while protecting the commercial value of intellectual property; identify portions of US laws and regulations that unnecessarily impede the commercial space sector, and propose amendments or elimination; provide for timely transfer of government-developed space technology to the private sector, including protection of its commercial value and retention of data rights by the private sector; and support trade policies that encourage a competitive international environment for space commerce. Many of these ideas were codified into congressional law with the passage of the Commercial Space Act of 1998, Public Law 105-303. This act calls for the US government to encourage the development of a commercial space industry in a number areas ranging form the commercialization of the International Space States (ISS); removal of barriers to applications of GPS; treatment and acquisition of space science data as a commercial item; and requirements for government procurement of commercial space transportation services. In response to this Act, NASA has developed plans for commercializing ISS and strategies for developing space commerce.

###  Predictable limits- creates more clash, because when we are able to use specific links we can argue more in depth on the topic, which increases education. Limits are good because of fairness, because it decreases the research burden on generic links, and increases it on more specific ones as well as case args.

### Neg ground- their interpretation severally limits neg ground, because we aren’t able to get links on things like politics or ks, because authors don’t assume monuments in space, due to the fact that they aren’t substantial.

### Brightline- We set a clear interpretation, of what is substantial, and what is not. Our definition is specific to a percentage. Theirs in extremely vague. As well as we state specifically commercial space projects are development.

### Topicality is a voting issue, for education and fairness. Our interpretation allows for a more educating debate because predictable limits, and makes it more fair by increasing neg ground so we can get links to their topic.

## 1NC – Space Development is Exploitation

### 1. Interpretation: Space development includes the exploitation of resources in space

### Space development is only used for exploiting outer space

SDPA 5 (Space Development Promotion Act of the Republic of Korea, Journal of Space Law, 33, 5-31, <http://www.spacelaw.olemiss.edu/library/space/Korea/Laws/33jsl175.pdf>)

Article 2 (Definitions) Definitions of terms used in this Act are as follows: (a) The term “space development” means one of the following: (i) Research and technology development activities related to design, production, launch, operation, etc. of space objects; (ii) Use and exploration of outer space and activities to facilitate them; (b) The term “space development project” means a project to promote space development or a project to pursue the development of education, technology, information, industry, etc. related to space development; (c) The term “space object” means an object designed and manufactured for use in outer space, including a launch vehicle, a satellite, a space ship and their components; (d) The term “space accident” means an occurrence of damage to life, body or property due to crash, collision or explosion of a space object or other situation; (e) The term “satellite information” means image, voice, sound or data acquired by using a satellite, or in formation made of their combination, including processed or applied information.

### 2. Violation: The aff just puts something in space without developing space’s resources

### 3. Standards:

### A. Predictable limits: Their interpretation explodes the limits of the topic. Their interpretation allows them to claim development as long as they send anything in space, they can send a TV and food into space and develop it into a super bowl party under their interpretation, which would be unpredictable and extremely abusive to the neg. Limits is also key to clash, without it we would have superficial debates with generic links and not gain any education.

### B. Neg Ground: Their interpretation destroys all neg ground because all critical literature and politics links are based off the assumption that they exploit space for its resources. The aff will win every round on a no link argument. This destroys competition, and without competition everyone leaves debate.

### C. Brightline- Our definition sets a clear interpretation of what is and what is not topical.

### 4. T is a voter for fairness and education and should be evaluated under a framework of competing interpretations

## 2NC – Space Development is Exploitation

### 1.Extend Our interpretation: Space development includes the exploitation of resources in space

### Extend SDPA 5 Which **says that the only use of space development is only used for exploiting space**

### Prefer our interpretation:

### **2. Extend our violation, the aff just puts things in space without exploiting the resources of space**

### **3. Standards**

### **A. Predictable limits: Their interp explodes the limits of the topic. They can claim development for sending anything in space and squirm out of all of our kritiks and disads because of the unpredictability of their aff. Limits are good because they decrease the number of affirmatives the aff can run on a topic, which in turn creates more in depth debates based on strategy and advocacy, instead of depending on surprising the other team. Their interpretation allows them to shoot garbage into the sun to develop it into a new dump, which would be unpredictable and impossible to garner any offence or specific links on. Limits is also the only way to achieve clash, because without them we would be forced to read generic links and arguments that probably won’t link anyway, because they can read abusive and untopical affs like (insert their aff here).**

### **B. Neg Ground: Their interpretation destroys all neg ground and makes it impossible to be neg. In order to have proper debate over the development of space we need to have a fair definition of what does and does not include development. We allow a fair amount of ground on both sides, because we allow them to exploit any celestial object in space, while we still can garner specific links and run various kritiks such as Cap K and can run politics disads. Under their interp they gain too much ground and isolates the neg into a tiny box where we can run two small disads, which kills competition and causes everyone to leave.**

### **C. Aff ground: The affirmative team still gets to run all of their core arguments such as mining asteroids, creating SPS, mining the moon, commercializing space, and many other affs. We do not make it impossible to be aff, they still have most of their aff ground, we just gaint he ground to run some kritiks. Also our definition is known as a more common definition, so it should be preferred because development usually means using reasources of an area, such as space.**

### **D. Brightline: We are the only people with a clear interpretation of what includes and excludes development, because their interp is vague so that their aff can fit it.**

### 5. Prefer competing interps over reasonability, you should weigh topicality like a disad. Also, reasonability is arbitrary and causes judge intervention, which is bad. T- is a voter for fairness and education.

# Substantial

## Substantial Increase = Double

### Substantial increase is double

Rosenthal 1989 [Harry, AP, “Space Council Wants Permanent Base on Moon, Mars Landing”, Lexis]

The National Space Council, working on "a major new space initiative," is focusing on an American return to the moon, establishing a permanent base and proceeding from there to Mars. But it will be expensive, warns Rep. Robert Walker, R-Pa., who was among a group of congressmen briefed Thursday on several options being considered by the council. Any of the options, Walker said, will require "a substantial increase in resources available to NASA - it will require doubling the size of NASA and the NASA budget." The council, headed by Vice President Dan Quayle, favors the moon-Mars scenario over other courses being considered, Walker said, but no final decision has been made. Quayle, NASA Administrator Richard H. Truly and Mark Albrecht, executive secretary of the space council, conducted the briefing.

### Substantial increase, in the context of space, is 50%

Shifrin 1987 [Carole, Space Technology, “Soviets Consider Possible Mars Rover, Sample Return Missions”, Lexis]

Allen cited the space station science program and Earth and ocean sciences as areas in which there are sound programs that are not adequately budgeted. "It is clear that to do the sound plan that NASA already has, at a reasonable pace, would require a very substantial increase in the NASA budget, perhaps as much as 50%," he said. "But that seems somewhat unlikely, under the kind of budget pressures that existed in the past."

## Substantially Increase DoD = 13%

### Increase in DOD R&D is 13%

AAAS 2k[ American Association for the Advancement of Science, “ DOD Basic Research Rises 13 Percent; Congress Allocates $9.4 Billion for S&T”, <http://www.aaas.org/spp/rd/dod01c.htm>, July 19th, 2000]

Congress is ready to send to President Clinton a final FY 2001 Defense appropriations bill providing substantial increases for Department of Defense (DOD) R&D. On July 17, a House-Senate conference committee released a conference report (final version) of the Defense appropriations bill (HR 4576) reconciling differences between the House and Senate versions of the bill. The final Defense bill adds even more money to the substantial increases contained in the House and Senate bills for most DOD R&D programs, in contrast to the cuts requested by the Pentagon and the Clinton Administration. Assuming that the Senate approves and the President signs the bill, both of which are likely, DOD's R&D in FY 2001 will total $41.9 billion, $3.4 billion more than the President's request and $2.6 billion or 6.6 percent more than FY 2000 (see Tables A and B). [The Senate approved the conference report on July 27, and President Clinton signed the bill into law on August 9.] The final Defense bill boosts DOD funding of basic research ("6.1") by $152 million or 13.1 percent to $1.3 billion. The final increase is above the House proposed increase of 11.5 percent and the Senate proposal of 10.5 percent. Applied research ("6.2") also increases substantially by 7.9 percent to $3.7 billion. Including DOD's medical research programs, DOD S&T (["6.1" through "6.3" programs, representing DOD's investment in basic and applied research and technology development, plus medical research contained in other accounts]) will increase by 8.3 percent to $9.4 billion, considerably more than the requested level of $7.6 billion.

## Substantially Increase NASA = 7%

### A substantial increase in Nasa Budget Is 7%

Alexander 07[Amir Alexander, Writer for the Planetary Society, “ NASA Mars Program Threatened by Senate Funding Bill” <http://planetary.org/news/2007/0703_NASA_Mars_Program_Threatened_by_Senate.html> July 3rd, 2007

Note: I had to do math for the percentage]

The Senate bill proposes these severe cuts to the Mars program despite the fact that overall it provides for a substantial increase in NASA funding. If approved, the bill will allocate NASA a total of $17.46 billion, $1.2 billion more than the agency’s 2007 budget, and $150 million more than the administration’s request for 2008. The proposal was crafted by the Senate Subcommittee on Commerce, Justice, and Science, and cleared the Senate Appropriations Committee on June 28, 2007.

## Substantially Increase DoC = 28.9%

### Increase in Department of Commerce Programs is over 28.9%

AAAS 2K[ American Association for the Advancement of Science, “ R&D in Selected Agencies” <http://www.aaas.org/spp/rd/chap14.htm> 2000]

Department of Commerce would see its R&D budget increase by 7.0 percent to $1.1 billion in FY 2001 due to an expanded intramural research program at the National Institute of Standards and Technology (NIST), a substantial increase for the Advanced Technology Program (ATP), and a new Institute for Information Infrastructure Protection (IIIP). There would also be a substantial increase in Technology Opportunity Grants aimed at developing new technologies to improve public access to information technologies (see Table II-14). · R&D in the Department of the Interior would increase by 2.9 percent to $590 million in FY 2001. Interior's lead science agency, the U.S. Geological Survey (USGS), would receive 7.3 percent more for its R&D programs for a total of $539 million. USGS would place a high priority on geographic and biological research (see Table II-16). The Department of Transportation's (DOT) R&D in FY 2001 would increase substantially by $172 million or 28.3 percent to $778 million (see Table II-15) for aviation, highway, and traffic safety R&D. The budget proposes to finance much of the increase with additional highway trust fund revenues, but a similar proposed increase was rejected by Congress last year. The Environmental Protection Agency's (EPA) R&D budget would increase 4.0 percent to $673 million (see Table II-17). Research on clean air, ecosystems, risk assessment, and emerging risk issues would be high priorities in the request. Department of Commerce The FY 2001 R&D request for the Department of Commerce totals $1.1 billion, a $75 million or 7.0 percent increase over FY 2000 (see Table II-14). Most of the increase is due to three R&D programs in the National Institute of Standards and Technology (NIST): the Measurement and Standards Laboratories (MSL), the Advanced Technology Program (ATP), and a new Institute for Information Infrastructure Protection. The MSL program funds NIST's intramural R&D at its Colorado and Maryland laboratories. NIST's labs provide U.S. industry with industrial standards and measurement technologies, and aim to bridge the gap between industrial R&D in company laboratories and the more basic research conducted in university and government labs. After several years of small requested increases, MSL R&D would jump by $33 million or 14.0 percent to $269 million. The increases would go toward the areas of manufacturing engineering, chemical sciences, physics, computer sciences, and applied mathematics to assist the semiconductor and electronics industries; to support expanded use of e-commerce by U.S. businesses; and to contribute to the Administration's nanotechnology initiative. The ATP would receive $148 million for its R&D activities in FY 2001, a 28.9 percent increase. ATP provides cost-shared, precompetitive research grants to industrial firms for developing promising new technologies with commercial potential. The Administration regularly requests substantial increases for this program, but Congress has usually cut the budget or given only a small increase.

## Substantial = research, development and manufacturing

### Contribution to research, development and manufacturing

US Code 10 (CHAPTER 141 > § 14701http://www.law.cornell.edu/uscode/search/display.html?terms=substantial%20outer%20space&url=/uscode/html/uscode42/usc\_sec\_42\_00014701----000-.html)

(8) the term “United States commercial provider” means a commercial provider, organized under the laws of the United States or of a State, which is— (A) more than 50 percent owned by United States nationals; or (B) a subsidiary of a foreign company and the Secretary of Transportation finds that— (i) such subsidiary has in the past evidenced a substantial commitment to the United States market through— (I) investments in the United States in long-term research, development, and manufacturing (including the manufacture of major components and subassemblies); and (II) significant contributions to employment in the United States; and

## Substantial = $5,000

### Substantial development = 5,000

Revised Code of Washington 11 (The Revised Code of Washington (RCW) is the compilation of all permanent laws now in force [note: in Washington]. It is a collection of Session Laws (enacted by the Legislature, and signed by the Governor, or enacted via the initiative process), arranged by topic, with amendments added and repealed laws removed. It does not include temporary laws such as appropriations acts. The official version of the RCW is published by the Statute Law Committee and the Code Reviser., “Definitions and concepts.,” RCW 90.58.030, 1/3, <http://apps.leg.wa.gov/RCW/default.aspx?cite=90.58.030>)

(e) "Substantial development" shall mean any development of which the total cost or fair market value exceeds five thousand dollars, or any development which materially interferes with the normal public use of the water or shorelines of the state. The dollar threshold established in this subsection (3)(e) must be adjusted for inflation by the office of financial management every five years, beginning July 1, 2007, based upon changes in the consumer price index during that time period. "Consumer price index" means, for any calendar year, that year's annual average consumer price index, Seattle, Washington area, for urban wage earners and clerical workers, all items, compiled by the bureau of labor and statistics, United States department of labor. The office of financial management must calculate the new dollar threshold and transmit it to the office of the code reviser for publication in the Washington State Register at least one month before the new dollar threshold is to take effect. The following shall not be considered substantial developments for the purpose of this chapter:

## Substantial = w/o mat quals

### Substantially means without material qualification

Black’s Law Dictionary 90(6th Edition, p. 1428-29)

Substantially. Essentially; without material qualification; in the main; in substance; materially; in a substantial manner.

## Substantially = Quantitative

### Substantial- considerable in quantity.

Merriam-Webster, 8(“substantial”, 2008, <http://www.merriam-webster.com/cgi-bin/dictionary?book=Dictionary&va=substantially>)

Main Entry: sub·stan·tial

1 a: consisting of or relating to [substance](http://www.merriam-webster.com/dictionary/substance) b: not imaginary or illusory : [real](http://www.merriam-webster.com/dictionary/real), [true](http://www.merriam-webster.com/dictionary/true) c: [important](http://www.merriam-webster.com/dictionary/important), [essential](http://www.merriam-webster.com/dictionary/essential)

2: ample to satisfy and nourish : [full](http://www.merriam-webster.com/dictionary/full) <a substantial meal>

3 a: possessed of means : [well-to-do](http://www.merriam-webster.com/dictionary/well-to-do) **b**: considerable in quantity : significantly great <earned a substantial wage>

4: firmly constructed : [sturdy](http://www.merriam-webster.com/dictionary/sturdy) <a substantial house>

5: being largely but not wholly that which is specified <a substantial lie>

### Substantial- Of ample or considerable amount, quantity, or size.

Random House Unabridged Dictionary, 6 (Dictionary.com Unabridged, “substantial”, <http://dictionary.reference.com/search?q=substantially&r=66>)

1. of ample or considerable amount, quantity, size, etc.: a substantial sum of money.

2. of a corporeal or material nature; tangible; real.

3. of solid character or quality; firm, stout, or strong: a substantial physique.

4. basic or essential; fundamental: two stories in substantial agreement.

5. wealthy or influential: one of the substantial men of the town.

6. of real worth, value, or effect: substantial reasons.

7. pertaining to the substance, matter, or material of a thing.

8. of or pertaining to the essence of a thing; essential, material, or important.

9. being a substance; having independent existence.

10. Philosophy. pertaining to or of the nature of substance rather than an accident or attribute.

## Substantially – Considerable

### "Substantial" means of real worth or considerable value --- this is the usual and customary meaning of the term

Words and Phrases 2 (Volume 40A, p. 458)

D.S.C. 1966. The word “substantial” within Civil Rights Act providing that a place is a public accommodation if a “substantial” portion of food which is served has moved in commerce must be construed in light of its usual and customary meaning, that is, something of real worth and importance; of considerable value; valuable, something worthwhile as distinguished from something without value or merely nominal

### “Substantial” means considerable or to a large degree --- this common meaning is preferable because the word is not a term of art

Arkush 2 (David, JD Candidate – Harvard University, “Preserving "Catalyst" Attorneys' Fees Under the Freedom of Information Act in the Wake of Buckhannon Board and Care Home v. West Virginia Department of Health and Human Resources”, Harvard Civil Rights-Civil Liberties Law Review, Winter,
37 Harv. C.R.-C.L. L. Rev. 131)

Plaintiffs should argue that the term "substantially prevail" is not a term of art because if considered a term of art, resort to Black's 7th produces a definition of "prevail" that could be interpreted adversely to plaintiffs. [99](http://www.lexis.com/research/retrieve?_m=1421887dc00d6c0b78bddb20857a69fa&docnum=16&_fmtstr=FULL&_startdoc=1&wchp=dGLbVzW-zSkAz&_md5=3f3ffe65eadff46b38ea49c40cb1037e&focBudTerms=definition%20of%20the%20term%21%20substantial%21%20or%20definition%20of%20the%20word%20substantial%21&focBudSel=all#n99) It is commonly accepted that words that are not legal terms of art should be accorded their ordinary, not their legal, meaning, [100](http://www.lexis.com/research/retrieve?_m=1421887dc00d6c0b78bddb20857a69fa&docnum=16&_fmtstr=FULL&_startdoc=1&wchp=dGLbVzW-zSkAz&_md5=3f3ffe65eadff46b38ea49c40cb1037e&focBudTerms=definition%20of%20the%20term%21%20substantial%21%20or%20definition%20of%20the%20word%20substantial%21&focBudSel=all#n100) and ordinary-usage dictionaries provide FOIA fee claimants with helpful arguments. The Supreme Court has already found favorable, temporally relevant definitions of the word "substantially" in ordinary dictionaries: "Substantially" suggests "considerable" or "specified to a large degree." See Webster's Third New International Dictionary 2280 (1976) (defining "substantially" as "in a substantial manner" and "substantial" as "considerable in amount, value, or worth" and "being that specified to a large degree or in the main"); see also 17 Oxford English Dictionary 66-67 (2d ed. 1989) ("substantial": "relating to or proceeding from the essence of a thing; essential"; "of ample or considerable amount, quantity or dimensions"). [101](http://www.lexis.com/research/retrieve?_m=1421887dc00d6c0b78bddb20857a69fa&docnum=16&_fmtstr=FULL&_startdoc=1&wchp=dGLbVzW-zSkAz&_md5=3f3ffe65eadff46b38ea49c40cb1037e&focBudTerms=definition%20of%20the%20term%21%20substantial%21%20or%20definition%20of%20the%20word%20substantial%21&focBudSel=all#n101)

### Substantial means “of considerable amount” --- not some contrived percentage

Prost 4 (Judge – United States Court of Appeals for the Federal Circuit, “Committee For Fairly Traded Venezuelan Cement v. United States”, 6-18, http://www.ll.georgetown.edu/federal/judicial/fed/opinions/04opinions/04-1016.html)

The URAA and the SAA neither amend nor refine the language of § 1677(4)(C).  In fact, they merely suggest, without disqualifying other alternatives, a “clearly higher/substantial proportion” approach.  Indeed, the SAA specifically mentions that no “precise mathematical formula” or “‘benchmark’ proportion” is to be used for a dumping concentration analysis.  SAA at 860 (citations omitted); see also Venez. Cement, 279 F. Supp. 2d at 1329-30.  Furthermore, as the Court of International Trade noted, the SAA emphasizes that the Commission retains the discretion to determine concentration of imports on a “case-by-case basis.”  SAA at 860.  Finally, the definition of the word “substantial” undercuts the CFTVC’s argument.  The word “substantial” generally means “considerable in amount, value or worth.”  Webster’s Third New International Dictionary 2280 (1993).  It does not imply a specific number or cut-off.  What may be substantial in one situation may not be in another situation.  The very breadth of the term “substantial” undercuts the CFTVC’s argument that Congress spoke clearly in establishing a standard for the Commission’s regional antidumping and countervailing duty analyses.  It therefore supports the conclusion that the Commission is owed deference in its interpretation of “substantial proportion.”  The Commission clearly embarked on its analysis having been given considerable leeway to interpret a particularly broad term.

## Substantially = Large

### Substantially increase means by a large amount

NRC 3 (Office of Nuclear Material Safety and Safeguards Policy and Procedures, April 2003,) <http://www.fontana.org/main/dev_serv/planning/ventana_eir/appendix_e.pdf>

“Substantial increase” means “important or significant in a large amount, extent, or degree,” and not resulting in insignificant or small benefit to the public health and safety, common defense and security, or the environment, regardless of costs. However, this standard is not intended to be interpreted in a way that would result in disapproval of worthwhile safety or security improvements with justifiable costs.2

### Substantially- to a great or significant extent.

Compact Oxford English Dictionary, 8 (“substantially”, 2008, http://www.askoxford.com/concise\_oed/substantially?view=uk)

substantially

adverb 1 to a great or significant extent. 2 for the most part; essentially.

### Substantially is to a great extent or degree

WordNet 1.6, 1997 (dictionary.com)

Substantially - adv 1: to a great extent or degree; "I'm afraid the film was well over budget"; "painting the room white made it seem considerably (or substantially) larger"; "the house has fallen considerably in value"; "the price went up substantially" [syn: well, considerably] 2: in a strong substantial way; "the house was substantially built".

### Substantial is of ample or considerable amount, quantity, or size

THE RANDOM HOUSE COLLEGE DICTIONARY, 1973, p. 844

Substantial - is of ample or considerable amount, quantity, or size.

## Context of Substantial Key

### Substantially must be given meaning even if arbitrary – contextual uses are key

**Devinsky ‘2** (Paul, IP UPDATE, VOLUME 5, NO. 11, NOVEMBER 2002, “Is Claim "Substantially" Definite?  Ask Person of Skill in the Art”, http://www.mwe.com/index.cfm/fuseaction/publications.nldetail/object\_id/c2c73bdb-9b1a-42bf-a2b7-075812dc0e2d.cfm)

In reversing a summary judgment of invalidity, the U.S. Court of Appeals for the Federal Circuit found that the district court, by failing to look beyond the intrinsic claim construction evidence to consider what a person of skill in the art would understand in a "technologic context," erroneously concluded the term "substantially" made a claim fatally indefinite.  Verve, LLC v. Crane Cams, Inc., Case No. 01-1417 (Fed. Cir. November 14, 2002). The patent in suit related to an improved push rod for an internal combustion engine.  The patent claims a hollow push rod whose overall diameter is larger at the middle than at the ends and has "substantially constant wall thickness" throughout the rod and rounded seats at the tips.  The district court found that the expression "substantially constant wall thickness" was not supported in the specification and prosecution history by a sufficiently clear definition of "substantially" and was, therefore, indefinite.  The district court recognized that the use of the term "substantially" may be definite in some cases but ruled that in this case it was indefinite because it was not further defined. The Federal Circuit reversed, concluding that the district court erred in requiring that the meaning of the term "substantially" in a particular "technologic context" be found solely in intrinsic evidence:  "While reference to intrinsic evidence is primary in interpreting claims, the criterion is the meaning of words as they would be understood by persons in the field of the invention."  Thus, the Federal Circuit instructed that "resolution of any ambiguity arising from the claims and specification may be aided by extrinsic evidence of usage and meaning of a term in the context of the invention."  The Federal Circuit remanded the case to the district court with instruction that "[t]he question is not whether the word 'substantially' has a fixed meaning as applied to 'constant wall thickness,' but how the phrase would be understood by persons **experienced in this field** of mechanics, upon reading the patent documents."

## Substantial Percentages = Arbitrary

### Substantially increase has no useful meaning unless its attached to a specific numerical target

Africa Research Bulletin, 02 **(“**WORLD SUMMIT FOR SUSTAINABLE DEVELOPMENT,” 9/1, lexis)

Negotiations having stalled for 48 hours, trading renewable energy for sanitation the US won the argument so there would only only be a reference in the final agreement that renewable energies "should be substantially increased". But with no commitments or timetables, environment and development groups believed that the agreement would be almost worthless.

## Substantially – A2: “Considerable Amount”

### Arbitrary --- there’s no objective determination of what is ‘considerable’

Stark 97 (Stephen J., “Key Words And Tricky Phrases: An Analysis Of Patent Drafter's Attempts To Circumvent The Language Of 35 U.S.C.”, Journal of Intellectual Property Law, Fall, 5 J. Intell. Prop. L. 365, Lexis)

1. Ordinary Meaning. First, words in a patent are to be given their ordinary meaning unless otherwise defined. [30](http://www.lexis.com/research/retrieve?_m=1421887dc00d6c0b78bddb20857a69fa&docnum=20&_fmtstr=FULL&_startdoc=1&wchp=dGLbVzW-zSkAz&_md5=3f3ffe65eadff46b38ea49c40cb1037e&focBudTerms=definition%20of%20the%20term%21%20substantial%21%20or%20definition%20of%20the%20word%20substantial%21&focBudSel=all" \l "n30" \t "_self) However, what if a particular word has multiple meanings? For example, consider the word "substantial." The Webster dictionary gives eleven different definitions of the word substantial. [31](http://www.lexis.com/research/retrieve?_m=1421887dc00d6c0b78bddb20857a69fa&docnum=20&_fmtstr=FULL&_startdoc=1&wchp=dGLbVzW-zSkAz&_md5=3f3ffe65eadff46b38ea49c40cb1037e&focBudTerms=definition%20of%20the%20term%21%20substantial%21%20or%20definition%20of%20the%20word%20substantial%21&focBudSel=all" \l "n31" \t "_self) Additionally, there are another two definitions specifically provided for the adverb "substantially." [32](http://www.lexis.com/research/retrieve?_m=1421887dc00d6c0b78bddb20857a69fa&docnum=20&_fmtstr=FULL&_startdoc=1&wchp=dGLbVzW-zSkAz&_md5=3f3ffe65eadff46b38ea49c40cb1037e&focBudTerms=definition%20of%20the%20term%21%20substantial%21%20or%20definition%20of%20the%20word%20substantial%21&focBudSel=all" \l "n32" \t "_self) Thus, the "ordinary meaning" is not clear. The first definition of the word "substantial" given by the Webster's Dictionary is "of ample or considerable amount, quantity, size, etc." [33](http://www.lexis.com/research/retrieve?_m=1421887dc00d6c0b78bddb20857a69fa&docnum=20&_fmtstr=FULL&_startdoc=1&wchp=dGLbVzW-zSkAz&_md5=3f3ffe65eadff46b38ea49c40cb1037e&focBudTerms=definition%20of%20the%20term%21%20substantial%21%20or%20definition%20of%20the%20word%20substantial%21&focBudSel=all" \l "n33" \t "_self) Supposing that this is the precise definition that the drafter had in mind when drafting the patent, the meaning of "ample or considerable amount" appears amorphous. This could have one of at least the following interpretations: (1) almost all, (2) more than half, or (3) barely enough to do the job. Therefore, the use of a term, such as "substantial," which usually has a very ambiguous meaning, makes the scope of protection particularly hard to determine.

### Accepting a substantial increase without linking it to a specific percentage is meaningless

Dube, 02(Steve, Western Mail, “EARTH SUMMIT RHETORIC BLASTED BY OBSERVERS DESPERATE FOR CHANGE,” 9/4, lexis)

There were also scathing words from Simon Thomas, the Ceredigion MP who attended the summit as a member of the House of Commons environment committee. Mr Thomas blasted British and European statesmen, including Rhodri Morgan and Tony Blair, for failing to stand up to the United States by insisting on raising the proportion of renewable energy produced to 15pc, and accepting instead a meaningless reference in the final agreement that renewable energy should be substantially increased.

# Increase

## Increase = Pre-Existing

### Increase requires pre-existence

**Ripple, 87** (Circuit Judge, Emmlee K. Cameron, Plaintiff-Appellant, v. Frances Slocum Bank & Trust Company, State Automobile Insurance Association, and Glassley Agency of Whitley, Indiana, Defendants-Appellees, 824 F.2d 570; 1987 U.S. App. LEXIS 9816, 9/24, lexis)

Also related to the waiver issue is appellees' defense relying on a provision of the insurance policy that suspends coverage where the risk is increased by any means within the knowledge or control of the insured. However, the term "increase" connotes change. To show change, appellees would have been required to present evidence of the condition of the building at the time the policy was issued. See 5 J. Appleman & J. Appleman, Insurance Law and Practice, § 2941 at 4-5 (1970). Because no such evidence was presented, this court cannot determine, on this record, whether the risk has, in fact, been increased. Indeed, the answer to this question may depend on Mr. Glassley's knowledge of the condition of the building at the time the policy was issued, see 17 J. Appleman & J. Appleman, Insurance Law and Practice, § 9602 at 515-16 (1981), since the fundamental issue is whether the appellees contemplated insuring the risk which incurred the loss.

## numerical baseline

### Baseline for increased space exploration is existing budget

 PRESIDENT’S COMMISSION ON IMPLEMENTATION OF UNITED STATES SPACE EXPLORATION POLICY 4

<http://www.nasa.gov/pdf/60736main_M2M_report_small.pdf>

 Instead, the President proposes to implement this space strategy in a series of incremental steps. Each is funded from a baseline defined by the current level of funding for our existing civil space initiatives. He proposes not one mission, but a progressively complex series of missions. Each builds on the shoulders of its predecessor “with measurable milestones” and each is “executed on the basis of available resources, accumulated experience, and technology readiness.”2

## Increase = Net Increase

### Increase must be a net increase

Judge Rogers 2005**,** STATE OF NEW YORK, ET AL., 6-24-**05**, PETITIONERS v. U.S. ENVIRONMENTAL PROTECTION AGENCY, RESPONDENT, NSR MANUFACTURERS ROUNDTABLE, ET AL., INTERVENORS, 2005 U.S. App.

 [\*\*48]  Statutory Interpretation. [HN16](http://www.lexis.com/research/retrieve?_m=1fe428155fdfc9074f3623f0dae9d78a&docnum=14&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=0ebd338d6a7793de8561db53b915effd&focBudTerms=term%20increase&focBudSel=all#clscc16)While the CAA defines a "modification" as any physical or operational change that "increases" emissions, it is silent on how to calculate such "increases" in emissions. [42 U.S.C. § 7411(a)(4)](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=4&_butStat=0&_butNum=103&_butInline=1&_butinfo=42%20U.S.C.%207411&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=1f89a0e47b1996a5400e8d865d8da08a). According to government petitioners, the lack of a statutory definition does not render the term "increases" ambiguous, but merely compels the court to give the term its "ordinary meaning." See [Engine Mfrs.Ass'nv.S.Coast AirQualityMgmt.Dist., 541 U.S. 246, 124 S. Ct. 1756, 1761, 158 L. Ed. 2d 529(2004)](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=3&_butStat=2&_butNum=104&_butInline=1&_butinfo=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b541%20U.S.%20246%5d%5d%3e%3c%2fcite%3e&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=48f016ea3eabfdb898b67b348b11662c); [Bluewater Network, 370 F.3d at 13](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=3&_butStat=2&_butNum=105&_butInline=1&_butinfo=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b370%20F.3d%201%2cat%2013%5d%5d%3e%3c%2fcite%3e&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=78fdfe9d48c7b91d7659b90c0198707e); [Am. Fed'n of Gov't Employees v. Glickman, 342 U.S. App. D.C. 7, 215 F.3d 7, 10 [\*23]  (D.C. Cir. 2000)](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=3&_butStat=2&_butNum=106&_butInline=1&_butinfo=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b342%20U.S.%20App.%20D.C.%207%5d%5d%3e%3c%2fcite%3e&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=fb18ff0b92931ac00621d88dae997e67). Relying on two "real world" analogies, government petitioners contend that the ordinary meaning of "increases" requires the baseline to be calculated from a period immediately preceding the change**.** They maintain, for example, that in determining whether a high-pressure weather system "increases" the local temperature, the relevant baseline is the temperature immediately preceding the arrival of the weather system, not the temperature five or ten years ago. Similarly,  [\*\*49]  in determining whether a new engine "increases" the value of a car, the relevant baseline is the value of the car immediately preceding the replacement of the engine, not the value of the car five or ten years ago when the engine was in perfect condition.

## Increase = Make Greater

### Increase doesn’t require pre-existence

Reinhardt, 05 – U.S. Judge for the UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT (Stephen, JASON RAY REYNOLDS; MATTHEW RAUSCH, Plaintiffs-Appellants, v. HARTFORD FINANCIAL SERVICES GROUP, INC.; HARTFORD FIRE INSURANCE COMPANY, Defendants-Appellees., lexis)

Specifically, we must decide whether charging a higher price for initial insurance than the insured would otherwise have been charged because of information in a consumer credit report constitutes an "increase in any charge" within the meaning of FCRA. First, we examine the definitions of "increase" and "charge." Hartford Fire contends that, limited to their ordinary definitions, these words apply only when a consumer has previously been charged for insurance and that charge has thereafter been increased by the insurer. The phrase, "has previously been charged," as used by Hartford, refers not only to a rate that the consumer has previously paid for insurance but also to a rate that the consumer has previously been quoted, even if that rate was increased [\*\*23] before the consumer made any payment. Reynolds disagrees, asserting that, under [\*1091] the ordinary definition of the term, an increase in a charge also occurs whenever an insurer charges a higher rate than it would otherwise have charged because of any factor--such as adverse credit information, age, or driving record 8 --regardless of whether the customer was previously charged some other rate. According to Reynolds, he was charged an increased rate because of his credit rating when he was compelled to pay a rate higher than the premium rate because he failed to obtain a high insurance score. Thus, he argues, the definitions of "increase" and "charge" encompass the insurance companies' practice. Reynolds is correct. “Increase" means to make something greater. See, e.g., OXFORD ENGLISH DICTIONARY (2d ed. 1989) ("The action, process, or fact of becoming or making greater; augmentation, growth, enlargement, extension."); WEBSTER'S NEW WORLD DICTIONARY OF AMERICAN ENGLISH (3d college ed. 1988) (defining "increase" as "growth, enlargement, etc[.]"). "Charge" means the price demanded for goods or services. See, e.g., OXFORD ENGLISH DICTIONARY (2d ed. 1989) ("The price required or demanded for service rendered, or (less usually) for goods supplied."); WEBSTER'S NEW WORLD DICTIONARY OF AMERICAN ENGLISH (3d college ed. 1988) ("The cost or price of an article, service, etc."). Nothing in the definition of these words implies that the term "increase in any charge for" should be limited to cases in which a company raises the rate that an individual has previously been charged.

## Increase – Mandate

### ‘Increase’ refers to a process, not an outcome --- the plan itself must increase exploration and/or development --- it cannot simply lead to it

HEFC 4 (Higher Education Funding Council, <http://www.publications.parliament.uk/pa/jt200304/jtselect/jtchar/1> 67/167we98.htm# n43)

9.1 The Draft Bill creates an obligation on the principal regulator to do all that it "reasonably can to meet the compliance objective in relation to the charity".[ 45] The Draft Bill defines the compliance objective as "to increase compliance by the charity trustees with their legal obligations in exercising control and management of the administration of the charity".[ 46] 9.2 Although the word "increase" is used in relation to the functions of a number of statutory bodies,[47] such examples demonstrate that "increase" is used in relation to considerations to be taken into account in the exercise of a function, rather than an objective in itself. 9.3 HEFCE is concerned that an obligation on principal regulators to "increase" compliance per se is unworkable, in so far as it does not adequately define the limits or nature of the statutory duty. Indeed, the obligation could be considered to be ever-increasing.

##  Increase – Net

### Increase means a net increase

Rogers 5 (Judge – New York, et al., Petitioners v. U.S. Environmental Protection Agency, Respondent, NSR Manufacturers Roundtable, et al., Intervenors, 2005 U.S. App. LEXIS 12378, \*\*; 60 ERC (BNA) 1791, 6/24, Lexis)

[\*\*48]  Statutory Interpretation. [HN16](http://www.lexis.com/research/retrieve?_m=1fe428155fdfc9074f3623f0dae9d78a&docnum=14&_fmtstr=FULL&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=0ebd338d6a7793de8561db53b915effd&focBudTerms=term%20increase&focBudSel=all#clscc16)While the CAA defines a "modification" as any physical or operational change that "increases" emissions, it is silent on how to calculate such "increases" in emissions. [42 U.S.C. § 7411(a)(4)](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=4&_butStat=0&_butNum=103&_butInline=1&_butinfo=42%20U.S.C.%207411&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=1f89a0e47b1996a5400e8d865d8da08a). According to government petitioners, the lack of a statutory definition does not render the term "increases" ambiguous, but merely compels the court to give the term its "ordinary meaning." See [Engine Mfrs.Ass'nv.S.Coast AirQualityMgmt.Dist., 541 U.S. 246, 124 S. Ct. 1756, 1761, 158 L. Ed. 2d 529(2004)](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=3&_butStat=2&_butNum=104&_butInline=1&_butinfo=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b541%20U.S.%20246%5d%5d%3e%3c%2fcite%3e&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=48f016ea3eabfdb898b67b348b11662c); [Bluewater Network, 370 F.3d at 13](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=3&_butStat=2&_butNum=105&_butInline=1&_butinfo=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b370%20F.3d%201%2cat%2013%5d%5d%3e%3c%2fcite%3e&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=78fdfe9d48c7b91d7659b90c0198707e); [Am. Fed'n of Gov't Employees v. Glickman, 342 U.S. App. D.C. 7, 215 F.3d 7, 10 [\*23]  (D.C. Cir. 2000)](http://www.lexis.com/research/buttonTFLink?_m=8541fbf7a7f5554ca588059b132acd17&_xfercite=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b367%20U.S.%20App.%20D.C.%203%5d%5d%3e%3c%2fcite%3e&_butType=3&_butStat=2&_butNum=106&_butInline=1&_butinfo=%3ccite%20cc%3d%22USA%22%3e%3c%21%5bCDATA%5b342%20U.S.%20App.%20D.C.%207%5d%5d%3e%3c%2fcite%3e&_fmtstr=FULL&docnum=14&_startdoc=1&wchp=dGLbVlz-zSkAW&_md5=fb18ff0b92931ac00621d88dae997e67). Relying on two "real world" analogies, government petitioners contend that the ordinary meaning of "increases" requires the baseline to be calculated from a period immediately preceding the change. They maintain, for example, that in determining whether a high-pressure weather system "increases" the local temperature, the relevant baseline is the temperature immediately preceding the arrival of the weather system, not the temperature five or ten years ago. Similarly,  [\*\*49]  in determining whether a new engine "increases" the value of a car, the relevant baseline is the value of the car immediately preceding the replacement of the engine, not the value of the car five or ten years ago when the engine was in perfect condition.

### Increase means net increase

**Words and Phrases 8** (v. 20a, p.264-265)

Cal.App.2 Dist. 1991. Term “increase,” as used in statute giving the Energy Commission modification jurisdiction over any alteration, replacement, or improvement of equipment that results in “increase” of 50 megawatts or more in electric generating capacity of existing thermal power plant, refers to “net increase” in power plant’s total generating capacity; in deciding whether there has been the requisite 50-megawatt increase as a result of new units being incorporated into a plant, Energy Commission cannot ignore decreases in capacity caused by retirement or deactivation of other units at plant. West’s Ann.Cal.Pub.Res.Code § 25123.

## Increase – Excludes Create

### Increase requires making an already program greater --- the Aff creates something new

**Buckley 6** (Jeremiah, Attorney, Amicus Curiae Brief, Safeco Ins. Co. of America et al v. Charles Burr et al, <http://supreme.lp.findlaw.com/supreme_court/briefs/06-84/06-84.mer.ami.mica.pdf>)

First, the court said that the ordinary meaning of the word “increase” is “to make something greater,” which it believed should not “be limited to cases in which a company raises the rate that an individual has previously been charged.” 435 F.3d at 1091. Yet the definition offered by the Ninth Circuit compels the opposite conclusion. Because “increase” means “to make something greater,” there must necessarily have been an existing premium, to which Edo’s actual premium may be compared, to determine whether an “increase” occurred. Congress could have provided that “ad-verse action” in the insurance context means charging an amount greater than the optimal premium, but instead chose to define adverse action in terms of an “increase.” That def-initional choice must be respected, not ignored. See Colautti v. Franklin, 439 U.S. 379, 392-93 n.10 (1979) (“[a] defin-ition which declares what a term ‘means’ . . . excludes any meaning that is not stated”). Next, the Ninth Circuit reasoned that because the Insurance Prong includes the words “existing or applied for,” Congress intended that an “increase in any charge” for insurance must “apply to all insurance transactions – from an initial policy of insurance to a renewal of a long-held policy.” 435 F.3d at 1091. This interpretation reads the words “exist-ing or applied for” in isolation. Other types of adverse action described in the Insurance Prong apply only to situations where a consumer had an existing policy of insurance, such as a “cancellation,” “reduction,” or “change” in insurance. Each of these forms of adverse action presupposes an already-existing policy, and under usual canons of statutory construction the term “increase” also should be construed to apply to increases of an already-existing policy. See Hibbs v. Winn, 542 U.S. 88, 101 (2004) (“a phrase gathers meaning from the words around it”) (citation omitted).

### Increase requires pre-existence

**Brown 3** (US Federal Judge – District Court of Oregon (Elena Mark and Paul Gustafson, Plaintiffs, v. Valley Insurance Company and Valley Property and Casualty, Defendants, 7-17, Lexis)

FCRA does not define the term "increase." The plain and ordinary meaning of the verb "to increase" is to make something greater or larger. 4 Merriam-Webster's [\*\*22] Collegiate Dictionary 589 (10th ed. 1998). The "something" that is increased in the statute is the "charge for any insurance." The plain and common meaning of the noun "charge" is "the price demanded for something." Id. at 192. Thus, the statute plainly means an insurer takes adverse action if the insurer makes greater (i.e., larger) the price demanded for insurance. An insurer cannot "make greater" something that did not exist previously. The statutory definition of adverse action, therefore, clearly anticipates an insurer must have made an initial charge or demand for payment before the insurer can increase that charge. In other words, an insurer cannot increase the charge for insurance unless the insurer previously set and demanded payment of the premium for that insured's insurance [\*\*23] coverage at a lower price.

# Its

## its is possessive

### ‘Its’ is possessive

English Grammar 5 (Glossary of English Grammar Terms, <http://www.usingenglish.com/glossary/possessive-pronoun.html>)

Mine, yours, his, hers, its, ours, theirs are the possessive [pronouns](http://www.usingenglish.com/glossary/pronoun.html) used to substitute a [noun](http://www.usingenglish.com/glossary/noun.html) and to show possession or ownership. EG. This is your disk and that's mine. (Mine substitutes the word disk and shows that it belongs to me.)

### Grammatically, this refers solely to U.S. activities

Manderino 73 (Justice – Supreme Court of Pennsylvania, “Sigal, Appellant, v. Manufacturers Light and Heat Co”., No. 26, Jan. T., 1972, Supreme Court of Pennsylvania, 450 Pa. 228; 299 A.2d 646; 1973 Pa. LEXIS 600; 44 Oil & Gas Rep. 214, Lexis)

On its face, the written instrument granting easement rights in this case is ambiguous. The same sentence which refers to the right to lay a 14 inch pipeline (singular) has a later reference to "said lines" (plural). The use of the plural "lines" makes no sense because the only previous reference has been to a "line" (singular). The writing is additionally ambiguous because other key words which are "also may change the size of its pipes" are dangling in that the possessive pronoun "its" before the word "pipes" does not have any subject preceding, to which the possessive pronoun refers. The dangling phrase is the beginning of a sentence, the first word of which does not begin with a capital letter as is customary in normal English [\*\*\*10]  usage. Immediately preceding the "sentence" which does not begin with a capital letter, there appears a dangling  [\*236]  semicolon which makes no sense at the beginning of a sentence and can hardly relate to the preceding sentence which is already properly punctuated by a closing period. The above deviations from accepted grammatical usage make difficult, if not impossible, a clear understanding of the words used or the intention of the parties. This is particularly true concerning the meaning of a disputed phrase in the instrument which states that the grantee is to pay damages from ". . . the relaying, maintaining and operating said pipeline. . . ." The instrument is ambiguous as to what the words ". . . relaying . . . said pipeline . . ." were intended to mean.

### And --- its a term of exclusion

Frey 28 (Judge – Supreme Court of Missouri, Supreme Court of Missouri,

320 Mo. 1058; 10 S.W.2d 47; 1928 Mo. LEXIS 834, Lexis)

In support of this contention appellant again argues that when any ambiguity exists in a will it is the duty of the court to construe the will under guidance of the presumption that the testatrix intended her property to go to her next of kin, unless there is a strong intention to the contrary. Again we say, there is intrinsic proof of a  [\*1074]  strong intention to the contrary. In the first place, testatrix only named two of her blood relatives in the will and had she desired [\*\*\*37]  them to take the residuary estate she doubtless would have mentioned them by name in the residuary clause. In the second place, if she used the word "heirs" in the sense of blood relatives she certainly would have dispelled all ambiguity by stating whose blood relatives were intended. Not only had  [\*\*53]  she taken pains in the will to identify her own two blood relatives but she had also identified certain blood relatives of her deceased husband. Had it been her intention to vest the residuary estate in her blood relatives solely, she would certainly have used the possessive pronoun "my" instead of the indefinite article "the" in the clause, "the above heirs."its is geographical

## Its = Associated with

### “Its” can mean “relating to”

Merriam-Webster Last updated 2011

For more than 150 years, in print and now online, Merriam-Webster has been America's leading and most-trusted provider of language information. <http://www.merriam-webster.com/dictionary/its>//DoeS

of or relating to it or itself especially as possessor, agent, or object of an action <going to its kennel> <a child proud of its first drawings> <its final enactment into law>

### “Its” can mean “associated in some way with”

World English Dictionary Last Updated 2009

<<http://dictionary.reference.com/browse/its>> //DoeS

determiner a. of, belonging to, or associated in some way with it: its left rear wheel b. ( as pronoun ): each town claims its is the best

### Its means related to

MacMillan Dictionary, 10 (<http://www.macmillandictionary.com/dictionary/american/its>)

Its [belonging](http://www.macmillandictionary.com/search/american/?q=belonging) [or](http://www.macmillandictionary.com/search/american/?q=or) [relating](http://www.macmillandictionary.com/search/american/?q=relating) [to](http://www.macmillandictionary.com/search/american/?q=to) [a](http://www.macmillandictionary.com/search/american/?q=a) [thing](http://www.macmillandictionary.com/search/american/?q=thing), [idea](http://www.macmillandictionary.com/search/american/?q=idea), [place](http://www.macmillandictionary.com/search/american/?q=place), [animal](http://www.macmillandictionary.com/search/american/?q=animal), [etc](http://www.macmillandictionary.com/search/american/?q=etc). [when](http://www.macmillandictionary.com/search/american/?q=when) [it](http://www.macmillandictionary.com/search/american/?q=it) [has](http://www.macmillandictionary.com/search/american/?q=has) [already](http://www.macmillandictionary.com/search/american/?q=already) [been](http://www.macmillandictionary.com/search/american/?q=been) [mentioned](http://www.macmillandictionary.com/search/american/?q=mentioned) [or](http://www.macmillandictionary.com/search/american/?q=or) [when](http://www.macmillandictionary.com/search/american/?q=when) [it](http://www.macmillandictionary.com/search/american/?q=it) [is](http://www.macmillandictionary.com/search/american/?q=is) [obvious](http://www.macmillandictionary.com/search/american/?q=obvious) [which](http://www.macmillandictionary.com/search/american/?q=which) [one](http://www.macmillandictionary.com/search/american/?q=one) [you](http://www.macmillandictionary.com/search/american/?q=you) [are](http://www.macmillandictionary.com/search/american/?q=are) [referring](http://www.macmillandictionary.com/search/american/?q=referring) [to](http://www.macmillandictionary.com/search/american/?q=to)

### Its means relating to as an agent

Merriam-Webster Dictionary, 11(http://www.merriam-webster.com/dictionary/its)

**:** of or relating to it or itself especially as possessor, agent, or object of an action <going to *its* kennel> <a child proud of *its* first drawings> <*its* final enactment into law>

## NASA is “its”

### The government has ownership over NASA

NASA Policy Directive, 1999

Expires April 16, 2014 NPD 1360.2B- Determines how NASA should be looked at while writing policies

<http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal\_ID=N\_PD\_1360\_002B\_&page\_name=main&format=PDF>//DoeS

Because space and aeronautical research projects generally require long lead times, are technically and scientifically challenging, and involve major investments of resources, and because NASA is a Government agency, NASA`s counterparts will generally be foreign government agencies rather than foreign universities or private organizations.

### Everything NASA has ever done required private contractors- no affs under the neg interp.

Clara Moskowitz, SPACE.com Senior Writer 7/22/10

NASA should use private spaceships, say astronauts <http://www.csmonitor.com/Science/2010/0716/NASA-should-use-private-spaceships-say-astronauts>//DoeS

Former space shuttle flyer John "Mike" Lounge, another signatory, said the letter was motivated in part as a response to critics of the Obama administration plan who argue that spaceships built by private companies would not be safe enough to trust for flying NASA astronauts. "It was a reaction to some of the letters you've seen out there – to kind of show there is another opinion among people who have flown in space," Lounge told SPACE.com. He said private companies are just as capable as NASA of designing safe, reliable spacecraft – in fact, he pointed out, all prior NASA spacecraft have been built by commercial companies, simply contracted by NASA. "The main thing we were trying to make a clear statement on, was that the safety of a system isn't so much a function of who owns it, so much as what it is, and that simple systems are safer than complex ones, and simple missions are safer than complex missions," Lounge said.

### NASA is a part of the USFG

**NASA, 11** (Glenn Research Center: Visiting our Center http://www.nasa.gov/centers/glenn/about/visit\_grc\_security\_policy.html)

NASA is a part of the Federal Government and both Lewis Field and Plum Brook Station are federal reservations subject to unique rules and regulations that may supersede those of the State of Ohio and local municipalities.

## DOD is “its”

### The DOD is owned by the USFG

The DOD Website, nd

Official Department of Defense Website, <http://www.defense.gov/about/>//DoeS

On behalf of the Secretary of Defense and Deputy Secretary of Defense, we welcome you to Defense.gov, the official web site for the Department of Defense and the starting point for finding U.S. military information online. The home page for this site is located at <http://www.defense.gov/>. The Secretary of Defense is the principal defense policy advisor to the President. Under the direction of the President, the Secretary exercises authority, direction, and control over the Department of Defense. The Deputy Secretary, the second-highest ranking official in the DoD, is delegated full power and authority to act for the Secretary and to exercise the powers of the Secretary on any and all matters for which the Secretary is authorized to act. The Department of Defense is America's oldest and largest government agency. With our military tracing its roots back to pre-Revolutionary times, the Department of Defense has grown and evolved with our nation.

### The DOD cannot use non-federal funding for space operations.

Messier 5/12

[Doug Messier](http://www.parabolicarc.com/author/doug/) on May 12, 2011, at 6:00 pm Douglas Messier hold a master’s degree in Science, Technology and Public Policy from The George Washington University, where he studied at the Space Policy Institute. He is a graduate of the International Space University and holds a B.A. in Journalism from Rider University.

<http://www.parabolicarc.com/2011/05/12/dod-seeks-authority-support-commercial-space-partnerships/>//DoeS

Current law “limits DoD to accepting reimbursement from commercial space companies for excess capacity in the form of launch property, facilities, or direct support services,” according to a presentation made to the FAA yesterday. “DoD is not allowed to accept non-DoD funding to enable or improve operation of commercial space launch capabilities, augmentation of DoD capabilities for commercial purposes, or adding commercial requirements to DoD contracts to extend/expand services in support of commercial Space launch activities.”

## Government Contracts are “its”

### Entities operating underneath a government contract are legally recognized as part of the government- many former court cases prove.

AINS Inc. v. United States 2004

United States Court of Appeals for the Federal Circuit 03-5134 AINS, INC. Plaintiff-Appellant, v. UNITED STATES, Defendant-Appellee DECIDED:  April 23, 2004 Judge Lawrence J. Block <http://www.ll.georgetown.edu/federal/judicial/fed/opinions/03opinions/03-5134.html>//DoeS

The first historically recorded NAFI in the United States was a self-supporting post fund that Army officers administered to aid indigent widows and children of deceased Civil War soldiers.  Congress expanded upon this idea to develop a system of  “post exchanges” (PXs), which the Army regulates and operates as profit making ventures.  After World War II, Congress expanded the idea of self-supporting agencies even further, and NAFIs began to appear throughout the civilian sector. The NAFI doctrine, as it relates to the Court of Federal Claims and to jurisdiction under the Tucker Act, began to develop following Standard Oil Company of California v. Johnson, 316 U.S. 481, 484-85 (1942).  In Standard Oil, the Supreme Court ruled that PXs qualified for a federal government exemption from a California motor vehicle fuel tax.  Id.  According to the Court, “post exchanges as now operated are arms of the Government deemed by it essential for the performance of governmental functions,” though the “government assumes none of the financial obligations of the exchange.”  Id. at 485. In other words, Standard Oil recognized the existence of “government agencies” for which the government had not accepted financial responsibility.  Standard Oil did not address the questions of liability and/or of sovereign immunity as applied to such “agencies.”  Shortly thereafter, however, the Court of Claims opined that its jurisdiction under the Tucker Act was limited to claims against the general fund, or more specifically, to claims against government instrumentalities whose judgments could be paid from appropriated funds.  The Court of Claims reasoned that when the government assumed no liability for a federal entity, the government could not be said to have consented to suit against that entity—and that the Tucker Act consequently provided the Claims Court with no jurisdiction to hear complaints against these entities.  NAFIs therefore retain their sovereign immunity from suit for breaches of contract that Congress waived with respect to government agencies funded by appropriations from the general fund.  See, e.g., Borden v. United States, 116 F. Supp. 873 (Ct. Cl. 1953); Pulaski Cab Co. v. United States, 157 F. Supp. 955 (Ct. Cl. 1958); Kyer v. United States, 369 F.2d 714 (Ct. Cl. 1966). It appears that Standard Oil did not compel this result.  The early cases articulating the doctrine that NAFIs retained sovereign immunity met with spirited insistence that the doctrine emerged from an erroneous interpretation of Standard Oil.  See, e.g., Borden, 116 F. Supp. at 910-14 (Whitaker, J., dissenting); Pulaski Cab Co., 157 F. Supp. at 958 (Whitaker, J., concurring).  In the Court of Claims’ first significant NAFI doctrine case, Borden was an accountant employed by an Army PX under contract with the PX.  Borden, 116 F. Supp. at 873.  Someone stole payroll funds from Borden’s office, and some of these funds were never recovered.  The PX withheld an amount equal to its loss from Borden’s salary, alleging that his negligence had caused the loss.  Borden sued the United States to recover his withheld salary.   The court recognized that this case presented an anomaly because Borden seemed to have no avenue along which to seek redress of his claims.  Id. at 907.  He could not sue the PX, with whom he had a contract, because it was an arm of the government.  And “in the light of [Standard Oil]. . . [the court] reluctantly reach[ed] the conclusion that plaintiff c[ould] not sue the United States on a contract of employment which is signed by the Army Exchange Service, European Theater.”  Id. at 907-09.  In dissent, Judge Whitaker complained that [t]he majority recognize that [Borden] should have a right of action, but they feel compelled to hold that he has not by the decision of the Supreme Court in Standard Oil. . . .  I do not feel so compelled. . . . Army regulations say exchange contracts are not government contracts, and, yet, the Supreme Court says that exchanges are "arms of the government." . . .  By what authority does the Army say that their contracts are not government contracts?  . . . The Army cannot set aside an Act of Congress

## Private Contractors aren’t “its”

### Private contractors are distinct from the federal government

Barbier 7 (Carl, US District Judge, TIEN VAN COA, ET AL VERSUS GREGORY WILSON, ET AL CIVIL ACTION NO: 07-7464 SECTION: J(1) UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF LOUISIANA 2007 U.S. Dist. LEXIS 87653)

However, in their motion to remand, Plaintiffs argue that as an *independent contractor,* P&J is not an employee of the federal government, and consequently does not enjoy derivative immunity and cannot invoke the FTCA. Plaintiffs cite United States v. New Mexico in support of the notion that private contractors, whether prime or subcontractors, are not government employees nor are they agents of the federal government. [455 U.S. 720, 102 S. Ct. 1373, 71 L. Ed. 2d 580 (1982)](http://www.lexisnexis.com.proxy.uchicago.edu/lnacui2api/mungo/lexseestat.do?bct=A&risb=21_T10427521803&homeCsi=6323&A=0.4336064238087415&urlEnc=ISO-8859-1&&citeString=455%20U.S.%20720&countryCode=USA). According to the Court, "[t]he congruence of professional interests between the contractors and the Federal Government is not complete" because "the contractors remained distinct entities pursuing private ends, and their actions remained  [\*4] commercial activities carried on for profit." [Id. at 740](http://www.lexisnexis.com.proxy.uchicago.edu/lnacui2api/mungo/lexseestat.do?bct=A&risb=21_T10427521803&homeCsi=6323&A=0.4336064238087415&urlEnc=ISO-8859-1&&citeString=455%20U.S.%20720,%20740&countryCode=USA); see

also[Powell v. U.S. Cartridge Co., 339 U.S. 497, 70 S. Ct. 755, 94 L. Ed. 1017 (1950)](http://www.lexisnexis.com.proxy.uchicago.edu/lnacui2api/mungo/lexseestat.do?bct=A&risb=21_T10427521803&homeCsi=6323&A=0.4336064238087415&urlEnc=ISO-8859-1&&citeString=339%20U.S.%20497&countryCode=USA).

## Contractors Meet

### Private contractors are agents of the US government

AUSNESS ‘86 – Professor of Law, University of Kentucky (RICHARD, Fall, “Surrogate Immunity: The Government Contract Defense and Products Liability.”, 47 Ohio St. L.J. 985, Lexis Law, dheidt)

The United States Supreme Court affirmed the circuit court's ruling. The Court reasoned that the immunity that protected officers and agents of the federal government acting within the scope of their authority should be extended to private contractors who also acted on the government's behalf. n71 According to the Court: ". . . [I]t is clear that if this authority to carry out the project was validly conferred, that is, if what was done was within the constitutional power of Congress, there is no liability on the part of the contractor for executing its will." n72 The court also observed that the landowner could have sought compensation from the government for his injury in the court of claims. n73 Apparently, it thought that the plaintiff had attempted to circumvent the accepted statutory procedure by suing the contractor instead of the government. n74

# Beyond

## Beyond – Dictionary

### Interpretation --- “Beyond” means outside the limits of

Collins 9 (Collins English Dictionary Unabridged, “beyond”, <http://dictionary.reference.com/browse/beyond>)

-- *prep*

1. at or to a point on the other side of; at or to the further side of: *beyond those hills there is a river*

2. outside the limits or scope of: beyond this country's jurisdiction

### Beyond is on the farther side

**OED ’89** (Oxford English Dictionary 1989 Second Edition <<http://oed.com/view/Entry/18511?redirectedFrom=beyond#eid>>L.F.)

**1.** On the farther side, farther away, at a greater distance.

### Beyond means further in space

**OED ’89** (Oxford English Dictionary 1989 Second Edition <<http://oed.com/view/Entry/18511?redirectedFrom=beyond#eid>>L.F.)

2. **b.** of an object regarded simply as a point in space: Past, further on than, at a more distant point or position than.

### Beyond means outside the sphere of

**OED ’89** (Oxford English Dictionary 1989 Second Edition <<http://oed.com/view/Entry/18511?redirectedFrom=beyond#eid>>L.F.)

 **a.** Outside the limit or sphere of, past; out of the grasp or reach of.

### Beyond means farther than

**MW 11** (Merriam Webster’s online dictionary 2011 <http://www.merriam-webster.com/dictionary/beyond?show=0&t=1308841091> L.F.)

**:** on or to the farther side **:** [farther](http://www.merriam-webster.com/dictionary/farther)

### Past

AHD 11 (American Heritage Dictionary, “beyond”, http://education.yahoo.com/reference/dictionary/entry/beyond)

PREPOSITION:

On the far side of; past: Just beyond the fence.

Later than; after: beyond midnight.

To a degree that is past the understanding, reach, or scope of: an evil beyond remedy.

To a degree or amount greater than: rich beyond his wildest dreams.

In addition to: asked for nothing beyond peace and quiet.

### Outside an area

Macmillon 11 (Dictionary, “beyond”, http://www.macmillandictionary.com/dictionary/american/beyond)

1 past a place or outside an area

a. [farther](http://www.macmillandictionary.com/search/american/direct/?q=farther) [away](http://www.macmillandictionary.com/search/american/direct/?q=away) [than](http://www.macmillandictionary.com/search/american/direct/?q=than) [something](http://www.macmillandictionary.com/search/american/direct/?q=something) [else](http://www.macmillandictionary.com/search/american/direct/?q=else)

[*He*](http://www.macmillandictionary.com/search/american/direct/?q=he)[*could*](http://www.macmillandictionary.com/search/american/direct/?q=could)[*see*](http://www.macmillandictionary.com/search/american/direct/?q=see)[*a*](http://www.macmillandictionary.com/search/american/direct/?q=a)[*line*](http://www.macmillandictionary.com/search/american/direct/?q=line)[*of*](http://www.macmillandictionary.com/search/american/direct/?q=of)[*cypress*](http://www.macmillandictionary.com/search/american/direct/?q=cypress)[*trees*](http://www.macmillandictionary.com/search/american/direct/?q=trees)[*and*](http://www.macmillandictionary.com/search/american/direct/?q=and)*,* [*beyond*](http://www.macmillandictionary.com/search/american/direct/?q=beyond)[*it*](http://www.macmillandictionary.com/search/american/direct/?q=it)*,* [*a*](http://www.macmillandictionary.com/search/american/direct/?q=a)[*landscape*](http://www.macmillandictionary.com/search/american/direct/?q=landscape)[*of*](http://www.macmillandictionary.com/search/american/direct/?q=of)[*red*](http://www.macmillandictionary.com/search/american/direct/?q=red)[*hills*](http://www.macmillandictionary.com/search/american/direct/?q=hills)*.*

[*Traders*](http://www.macmillandictionary.com/search/american/direct/?q=traders)[*looked*](http://www.macmillandictionary.com/search/american/direct/?q=looked)[*eastward*](http://www.macmillandictionary.com/search/american/direct/?q=eastward)[*to*](http://www.macmillandictionary.com/search/american/direct/?q=to)[*India*](http://www.macmillandictionary.com/search/american/direct/?q=india)[*and*](http://www.macmillandictionary.com/search/american/direct/?q=and)[*beyond*](http://www.macmillandictionary.com/search/american/direct/?q=beyond)*.*

b. [outside](http://www.macmillandictionary.com/search/american/direct/?q=outside) [a](http://www.macmillandictionary.com/search/american/direct/?q=a) [particular](http://www.macmillandictionary.com/search/american/direct/?q=particular) [area](http://www.macmillandictionary.com/search/american/direct/?q=area)

[By](http://www.macmillandictionary.com/search/american/direct/?q=by) [now](http://www.macmillandictionary.com/search/american/direct/?q=now) [Dr](http://www.macmillandictionary.com/search/american/direct/?q=dr). [Barnard’s](http://www.macmillandictionary.com/search/american/direct/?q=barnard%27s) [fame](http://www.macmillandictionary.com/search/american/direct/?q=fame) [had](http://www.macmillandictionary.com/search/american/direct/?q=had) [spread](http://www.macmillandictionary.com/search/american/direct/?q=spread) [far](http://www.macmillandictionary.com/search/american/direct/?q=far) [beyond](http://www.macmillandictionary.com/search/american/direct/?q=beyond) [South](http://www.macmillandictionary.com/search/american/direct/?q=south) [Africa](http://www.macmillandictionary.com/search/american/direct/?q=africa).

### On the other side of ---

Encarta 9 (World English Dictionary, “beyond”, http://encarta.msn.com/encnet/features/dictionary/DictionaryResults.aspx?refid=1861590257)

be·yond [ [bee ónd, bi yónd](http://encarta.msn.com/encnet/features/dictionary/Pronounce.aspx?search=beyond) ] CORE MEANING: a grammatical word indicating that something is on the other side of something else, either physically or in the abstract
 (prep) They are expanding environmental protection programs beyond the border area.
 (prep) The gift of laughter is beyond price.

### Outside a stated limit

Cambridge 10 (Dictionaries Online, “beyond”, http://dictionaries.cambridge.org/define.asp?key=beyond\*2+0&dict=A)

beyond (OUTSIDE A LIMIT)
 [[Show phonetics]](http://dictionaries.cambridge.org/define.asp?dict=A&key=beyond*2+0&ph=on)
preposition, adverb
outside or after a stated limit

## Beyond = Away from

### Beyond must mean away from the SPEAKER

Talmey 5 Professor Emeritus of Linguistics University at Buffalo, State University of New York Visiting Scholar University of California, Berkeley From perception to meaning: image schemas in cognitive linguistics Ed. Beate Hampe, Joseph E. Grady

 The class designated as scene segmentation may include only one category, that of "major components of a scene"\*, and this category may contain only three member elements: the Figure, the Ground, and a Secondary Reference Object. Figure and Ground were already seen for the across schema. But schema comparison shows the need to recognize a third scene component, the Secondary Reference Object - in fact, two forms of it: one that is encompassive of Figure and Ground and one that is external to them. The English preposition near, as in (8a), specifics the location of the Figure {the lamp) only with respect to the Ground (the TV) - it could be anywhere roughly within a sphere centered on the TV provided the distance between them is relatively small. But localizing the Figure with the preposition above. as in (8b), requires knowledge not only of where the Ground object is. but also of the encompassive earth-based spatial grid, in particular, of its vertical orientation. Thus, above requires recognizing three components within a spatial scene, a Figure, a Ground, and a Secondary Reference Object of the encompassive type. (8) a. The lamp is near the TV. b. The lamp is above the TV. Comparably, the schema of past, as in (9a). only relates John as Figure to the border as Ground, An observer could felicitously say this sentence on viewing the event through binoculars from either side of the border. But (9b) with the preposition beyond could be said only by an observer on the initial side of the border, the side now opposite John. Hence, the beyond schema establishes a perspective point at that location as a Secondary Reference Object - in this case, one of the external type - in addition to its specifications for Figure and Ground. (9) a. John is past the border, b. John is beyond the border.

## Beyond/Space

### BEYOND specifically excludes earth observation – it must be directed OUTWARDS

Vega Space 11 <http://www.vegaspace.eu/newsroom/in_focus/space_exploration.aspx> VEGA is one of the leading names in the European Space sector, working with Space agencies, satellite operators and manufacturers worldwide. We support the full programme lifecycle to ensure that the design, development and operation of Space missions meet their programme goals. Founded in 1978, VEGA now employs over 400 highly-qualified staff in the Space domain, working for our companies in the UK, Germany, France and Spain. We support the full programme lifecycle, to ensure that the design, development and operation of Space missions meet their programme goals. We can look back on more than 30 years' involvement in almost every European Space Agency mission and many other European and international programmes. Looking forward, we are working hard to evolve our technology and improve the quality and efficiency of our services to enable us to remain at the forefront of national and international Space endeavours.

 Space exploration missions are about looking outward from Earth towards the Sun, other planets the universe and beyond.

## Mesosphere

### The mesosphere is what *distinguishes* space from Earth’s environment, critically dividing literature relevant to the topic

Athena 10 (Upper Atmosphere Wiki, “Mesosphere”, 4-26, [http://www.athena-spu.gr/~upperatmosphere/index.php/ Mesosphere](http://www.athena-spu.gr/~upperatmosphere/index.php/%20Mesosphere))

Being the “gateway” that connects Earth’s environment and space, the mesosphere is a region of great importance in energy balance processes and a link in vertical energy transfer, as it is in these layers that great surges of energy meet: solar radiation and particles contribute to downward energy transfer, whereas [gravity waves](http://www.athena-spu.gr/~upperatmosphere/index.php/Gravity_Waves), [planetary waves and tides](http://www.athena-spu.gr/~upperatmosphere/index.php/Planetary_Waves_and_Tides) contribute to upward energy transfer from the stratosphere. Thus this region is a boundary layer that determines the temperature and density characteristics of the surrounding layers. In addition, in a time of increased concern about global climate change, the fact that the mesosphere might act as a “canary in a coal mine”, being a sensitive indicator of global temperature change, makes its long-term study an increasingly pressing matter. Finally, the continuous and ever-increasing presence of mankind in space, and the importance of the behavior of this region to multiple issues related to aerospace technology, such as orbital calculations, vehicle re-entry, space debris lifetime etc., make its extensive study a pressing need.

### That means activities must occur above 50 miles from the Earth’s surface

WC 11 (Weather Channel – Weather Glossary, “M”, <http://www.weather.com/glossary/m.html>)

MESOSPHERE

The layer of the [atmosphere](http://www.weather.com/glossary/a.html#atmo) located between the [stratosphere](http://www.weather.com/glossary/s.html#strato) and the [ionosphere](http://www.weather.com/glossary/i.html#iono), where[temperatures](http://www.weather.com/glossary/t.html#temp) drop rapidly with increasing height. It extends between 31 and 50 miles (17 to 80 kilometers) above the earth's surface.

### Topical action must be in the thermosphere or higher

Atmospheric Chemistry Glossary 11 (Sam Houston State University, http://www.shsu.edu/~chm\_tgc/Glossary/lmn.html#M)

[Mesosphere](http://www.windows2universe.org/earth/Atmosphere/mesosphere.html) - In the atmosphere, the region immediately above the stratosphere and immediately below the thermosphere. The mesosphere begins about 50 kilometers high at the stratopause and ends about 80 kilometers high at the mesopause. The temperature in the mesosphere decreases sharply with increased altitude. [Journal of the Atmospheric Sciences; v49n24; 2353-2371; 1992.] [Introduction to Meteorology; F.W. Cole; page 7; 1980; John Wiley and Sons New York.]

### 80 kilometers and above is topical

OED 11 (Compact Oxford English Dictionary, “mesosphere”, http://oxforddictionaries.com/definition/mesosphere?view=uk)

the region of the earth's atmosphere above the stratosphere and below the thermosphere, between about 50 and 80 km in altitude.

### 50-80 Km

Weisstein 7 (Eric W., Math and Science Encyclopedist, World of Astronomy, http://scienceworld.wolfram.com/astronomy/Mesosphere.html)

The region of the [Earth](http://scienceworld.wolfram.com/astronomy/Earth.html)'s atmosphere from roughly 50-80 km altitude.

# Of

## Of Excludes – Ground-based

### The preposition “of” excludes landsats – they only meet the resolution “in” outer space

Gorove 73 <http://www.spacelaw.olemiss.edu/JSL/Back_issues/JSL%201.pdf> \*Chairman of the Graduate Program of the School of Law and Professor of Law, University of Mississippi School of Law. Copyright 1973, Journal of Space Law - University, Mississippi 38677; [No. t Spring 1973, pp. 1-104; No.2, Fall 1973, pp. 105-208

 Similarly, it may be noted that freedom of scientific investigation "in" outer space which is guaranteed by the last paragraph of Article-I of the Outer Space Treaty would be applicable to a scientific investigation of the earth despite the fact the earth cannot be regarded under the nomenclature used in the Treaty as a part of outer space. This line of reasoning may find support in -the clear-cut wording -of the Treaty which speaks about scientific investigation "in" outer space rather than scientific investigation "of" outer space.

### “of” outer space means that outer space must be the object, not just the location

Bocksteigel 95 Research and invention in outer space: liability and intellectual property rights - ed: Mosteshar \* Director of the Institute of Air and Space Law and Holder of the Chair for International Business Law at the University of Cologne, Germany; Chairman of Council of the National German Space Agency (DARA); Chairman of the Space Law Committee of the International Law Association; Member of the Board of Directors of the International Institute of Space Law; Member of the Council of the ICC Institute of International Business Law and Practice. •• Originally presented at the Seminar organized by the IBA and the Institute of International Business Law of the ICC on 6 and 7 December 1990 (Paris).

 The official title of the Outer Space Treaty COST') mentions both exploration and use of outer space as the two 'activities of States' which one has to take into account and which are there- fore covered by the Outer Space Treaty. The same pair of terms appear again in the Preamble as well as further articles such as Article I and Article III of the Treaty. Other articles and other space treaties either take up only one of these two terms or use a general terms such as 'activities in outer space' (Art. VI, OST) or generally deal with 'objects launched into outer space' (Art. VII, Art. VIII, OST and the Registration Convention) or 'space objects' (Liability Convention) or finally 'activities of States on the Moon and other celestial bodies' (Moon Treaty). At first sight, the distinction between exploration and use may seem sufficiently clear. Indeed in connection with most space activi- ties there may be little doubt which of these two terms is applica- ble. First doubts appear, however, because the Outer Space Treaty speaks of exploration 'of outer space'. This wording could be interpreted to mean that space must be the object of the exploration.

# Space

## Space - Nasa Def

### NASA defines space at 50 miles.

Thirsk 9 (Robert, Canadian Space Agency, et al., “The Space-Flight Environment: the International Space Station and Beyond”, Canadian Medical Association Journal, 180(12), June, [http://www.ecmaj.ca/cgi/content/full/180/12/ 1216](http://www.ecmaj.ca/cgi/content/full/180/12/1216))

There are different definitions for the boundary to space. National Aeronautics and Space Administration (NASA) uses flight above 80 km to designate individuals as astronauts, while the Fédération Aéronautique Internationale uses the 100 km Karman line as the internationally accepted boundary to space. Beyond this altitude, aerodynamic flight is not possible, and spacecraft must travel faster than orbital velocity to manoeuvre and remain in orbit.

## Space = region between the celestial bodies

### Space is the region between celestial bodies

**Thefreedictionary.com, no date** (<http://www.thefreedictionary.com/space>, 6/23/11, JPW)

 7. (Astronomy)

a. the region beyond the earth's atmosphere occurring between the celestial bodies of the universe. The density is normally negligible although cosmic rays, meteorites, gas clouds, etc., can occur. It can be divided into cislunar space (between the earth and moon), interplanetary space, interstellar space, and intergalactic space

## Space = 3-dimensional area

### Space is the three-dimensional realm where things are

**Dictionary.com, no date** (<http://dictionary.reference.com/browse/space>, 6/23/11, JPW)

1. the unlimited or incalculably great three-dimensional realm or expanse in which all material objects are located and all events occur.

### Space is an area in one, two or three dimensions

**Merriam-Webster.com, no date** (<http://www.merriam-webster.com/dictionary/space>, 6/23/11, JPW)

2. a: a limited extent in one, two, or three dimensions

b: an extent set apart or available

### Space is everything

**Thefreedictionary.com, no date** (<http://www.thefreedictionary.com/space>, 6/23/11, JPW)

1.

a. Mathematics A set of elements or points satisfying specified geometric postulates: non-Euclidean space.

b. The infinite extension of the three-dimensional region in which all matter exists.

### Space is everything

**Whatisspace.com, no date** (<http://www.whatisspace.com/>, “What is Space?”, 6/23/11, JPW)

Space is the limitless, boundless, three-dimensional extent where objects and events occur and have relative position and direction. Generally, physical space is conceived in 3 linear dimensions, although modern physicists typically consider it (along with time) to be part of the boundless four-dimensional continuum that is known as spacetime.

## Space = a particular place

### Space refers to a particular place

**Dictionary.com, no date** (<http://dictionary.reference.com/browse/space>, 6/23/11, JPW)

8. a place available for a particular purpose: a parking space.

### Space is an area reserved for a particular purpose

**Thefreedictionary.com, no date** (<http://www.thefreedictionary.com/space>, 6/23/11, JPW)

c. An area provided for a particular purpose: a parking space.

## Space = a period of time

### Space is a period of time

**Merriam-Webster.com, no date** (<http://www.merriam-webster.com/dictionary/space>, 6/23/11, JPW)

**1:** a period of time; also **:** its duration

### Space is an interval of time

**Dictionary.com, no date** (<http://dictionary.reference.com/browse/space>, 6/23/11, JPW)

12. an interval of time; a while: After a space he continued his story.

## Space = where the celestial bodies are

### Space is where celestial bodies such as stars exist

**Thefreedictionary.com, no date** (<http://www.thefreedictionary.com/space>, 6/23/11, JPW)

2.

a. The expanse in which the solar system, stars, and galaxies exist; the universe.

b. The region of this expanse beyond Earth's atmosphere.

# Space Ex

## Exploration = astronomy, etc

### Space exploration is astronomy, unmanned probes, and manned probes

Khan 9 (Ather Khan is the director for on demand quality and problem management at the Oracle Corporation for computing and engineering. He graduated from Western Michigan University and the University of Mumbai for computer software. October 14, 2009 “How Space is Explored” <http://all-space-technology.blogspot.com/2009/10/how-space-is-explored-space-was.html>)

Space was explored as early as the fourth century BCE, through ancient astronomy. It was only in the twentieth-century that man sent out probes and himself to explore space. Space exploration, then, can be broken into three conclusive categories: astronomy, unmanned probes, and manned probes. The sub-page branches listed below represent these three fields of space exploration. Although seemingly contrary to the divisions just drawn, man is the explorer in all of these sub-pages; it is man's dream, technology, and understanding of science that forms the basis of all forms of space exploration. The exploration of space is value based, that is, man has "reason" to send men to the moon and to study distant galaxies, just to name a couples such values. (For a more complete exploration of man's "reason," see Issues on Space Exploration: Why we explore space.) From ancient times, to well into to the twentieth-century, the only technologically feasible method to explore space was astronomy--the studying of the millions of stars and neighboring planets, which invade night sky, as they have done for billions of years. The mysterious movements of the planets and the ebbing of stars across the sky had originally found explanations in religion, but as man's understanding of the science of astronomy increased natural laws, and not dogma, took form. And, as a solid foundation was laid with ground-based astronomy, man walked resolutely into the Space Age, upon the advent of the modern rocket. Given this stepping stone of the liquid fueled rocket, man was able to enter the cosmic "ocean." Public support for the space program, during the Cold War era, allocated millions of dollars to the exploration of space, but this trend has ceased in the later part of the twentieth-century. The peak of space exploration, as a function of government and public support, apexes in the 1970's, with the Apollo program. The public has generally been more supportive of the manned exploration program, but the costs and the values at risk are malignant to the support of space exploration as a whole. Today, economic resources for space exploration are scarce and public, and thus government support is relatively low. The glorious Apollo missions are impossible to reconstruct, and instead there has been a steady trend towards unmanned space exploration. What the future of space exploration will hold is highly dependant on the rising generation, and the values they hold towards space exploration.

## Exploration = discovery, etc

### “Exploration” includes geographical discovery, scientific investigation, resource extraction, and high risk travel—also answers common dictionary definitions

Lester 9 (Daniel F. Lester, Michael Robinson, Department of Astronomy C1400, University of Texas, Austin, TX 78712, USA b Hillyer College, University of Hartford, Visiions of Exploration, Space Policy 25 (2009), p. 237-8 http://www.sciencedirect.com/science/article/pii/S0265964609000691)

The historical record offers a rich set of examples of what we call exploration: Christopher Columbus sailing to the New World, Roald Amundsen driving his dogs towards the South Pole, and Neil Armstrong stepping into the soft dust of the Moon. Yet these examples illustrate the difficulty in pinning down exploration as an activity. If we define exploration as travel through an unfamiliar area in order to learn about it we exclude Columbus, whose discovery was serendipitous rather than purposeful. We would also have to exclude Amundsen and Armstrong, and indeed many of the pantheon of explorers, who tended to dash across new terrain rather than investigate it systematically. Even more expansive terms such as ‘‘discovery’’ sometimes offer a poor fit for the object of modern expeditions: did Robert Peary discover the North Pole in 1909, an axis point that Greek astronomers knew about 2500 years ago? Not in any meaningful sense of the word. Students of exploration, then, must make peace with this uncomfortable fact: ‘‘exploration’’ is a multivalent term, one which has been (and undoubtedly will continue to be) used in different ways by different people. Geographical discovery, scientific investigation, resource extraction, and high-risk travel are activities tucked inside this definitional basket.

## Space Ex - Must be presence

### “Space exploration” requires physical exploration

OECD 7 (The Space Economy At A Glance, p. 62)Dictionary

*Definition*

Space exploration is the physical exploration of outer-Earth objects, via robotic probes and human missions. More broadly, it also includes the scientific disciplines *(e.g.* astronomy, solar physics, astrophysics, planetary sciences), technologies and policies applied to space endeavours.

### Physical presence in space through humans OR ROBOTS is a necessary MINIMUM for a clear definition of space exploration

Faith 8/31/9 <http://www.thespacereview.com/article/1456/1> “ Giving NASA a clear mission “ G. Ryan Faith is an adjunct fellow at the Center for Strategic and International Studies (CSIS).

 Giving NASA a clear mission If neither technology-oriented nor destination-oriented objectives seem able to provide a sense of direction to guide the nation’s efforts in space, then what can? To approach this question, it is useful to ask why President Kennedy’s challenge to go to the Moon was so effective in providing NASA with leadership. The critical element of this challenge that, although never explicit, was so important to NASA’s health and growth during this period was the transformation—at least in fact, if not in law—into an exploration agency. If we wish to see NASA act effectively as a space exploration agency, then the most direct way to do this is to amend the Space Act to explicitly task the agency with the job of space exploration. However, before we do so, we must define what space exploration actually is. Space exploration is the expansion of human influence in space. This definition of exploration is inherently one of capacity building. Human influence in space is a measure of our ability to do useful things beyond the Earth’s surface. In order to do something useful, there has to be some sort of human presence, either humans themselves or their robotic proxies. Once some measure of human influence has been established at some destination in space, there are two ways a space exploration agency can expand that influence. One, the agency can decrease the costs and increase the benefits of human influence at a given location until such influence becomes sufficiently useful that it is economically self-sustaining, at which point continued use of agency resources is unnecessary. Alternately, human influence can be extended to some new place that may in future become home to some form of self-supporting human influence. The key element is that such a mandate compels each step to build on past accomplishments and lay the groundwork for future missions.

### Space Ex. include both staffed and unstaffed missions, but exclude purely earth-based observation, which blows the topic wide open

National Research Council Committee on Exploration of the Seas 3 Exploration of the seas: voyage into the unknown, google books By National Research Council (U.S.). Committee on Exploration of the Seas

 The division produces 60-70 reports per year. These reports are unique, authoritative expert evaluations. Each report is produced by a committee of experts selected by the Academy to address a particular statement of task and is subject to a rigorous, independent peer review. The experts who volunteer their time participating on study committees are vetted to make sure that the committee has the range of expertise needed to address the task, that they have a balance of perspectives, and to identify and eliminate members with conflicts of interest. All reports undergo a rigorous, independent peer review to assure that the statement of task has been addressed, that conclusions are adequately supported, and that all important issues raised by the reviewers are addressed. Thus, while the reports represent views of the committee, they also are endorsed by the Academy. As defined by the President's Panel on Ocean Exploration (National Oceanic and Atmospheric Administration, 2000), exploration is discovery through disciplined, diverse observations and the recording of findings. Ocean exploration has included rigorous, systematic observation and docu- mentation of the biological, chemical, physical, geological, and archaeo- logical aspects of the ocean in the three dimensions of space and in time. This definition of exploration is much broader than the definition one would find, for example, within the context for the extractive industries, where exploration is a search for hydrocarbon or mineral deposits.

### Space exploration means presence on planets and object in the solar system

Ehrenfreund, Peter, Schrogl, Logsdon 10 “ Cross-cultural management supporting global space exploration “ Acta Astronautica, Volume 66, Issues 1-2, January-February 2010, Pages 245-256 Logsdon: John Logsdon is former Director of the Space Policy Institute at The George Washington University.[Logsdon was a member of the Columbia Accident Investigation Board. He is a current member of the NASA Advisory Council. He is frequently cited as an authority on space policy by press entities such as The New York Times and The Washington Post. Logsdon is a professor emeritus of political science and international affairs, and has been on the GWU faculty since 1970. He is also on the faculty of the International Space University, and held the first Chair in Space History at the National Air and Space Museum. During 2008-2009, he is the Charles A. Lindbergh Chair of Aerospace History at the National Air and Space Museum, Smithsonian Institution. Logsdon authored the entry on "space exploration" for the latest edition of the Encyclopædia Britannicaand many articles and commentaries. Ehrenfreund: Pascale Ehrenfreund, (Ph.D. Thesis University of Vienna/ University Paris VII) Research Professor of Space Policy and International Affairs. Molecular Biology, Space Science and related policy making, technology management. Nicolas Peter: Research Fellow, European Space Policy Institute, M.A. in International Science and Technology Policy - Elliott School of International Affairs -The George Washington University, Washington D.C., USA Schrogl: Director, European Space Policy Institute (ESPI); Vienna, Austria 1993 Doctorate Degree in Political Science, University of Tübingen, Germany 1989 M.A., University of Tübingen, Germany 1984-1989 Studies in Political Science and German Literature, Universities of Tübingen, Freiburg and Newcastle upon Tyne

 The European Space Agency ESA defines exploration as the ‘‘travel through [and to] an unfamiliar area in order to learn about it’’ and space exploration as ‘‘extending access and a sustainable presence for humans in the Earth–Moon–Mars space, including the Lagrangian points and near-Earth objects’’ [1]. In this paper we adopt this definition of space exploration to explore robotically and later with humans neighboring planets and small bodies of our solar system.

## Space Ex must be Human

### Space exploration has to include human presence

Logsdon 9 <http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20100025875_2010028362.pdf> Dr. Logsdon is Professor Emeritus of Political Science and International Affairs at George Washington University’s Elliott School of International Affairs. Prior to his leaving active faculty status in June 2008, he was on the faculty of the George Washington University for 38 years; before that he taught at the Catholic University of America for four years. He was the founder in 1987 and long-time Director of GW’s Space Policy Institute. From 1983-2001, he was also Director of the School’s Center for International Science and Technology Policy. He is also a faculty member of the International Space University. During the 2007-2008 academic year, he was a Distinguished Visiting Professor at MIT’s Science, Technology and Society Program on a part-time basis. He holds a B.S. in Physics from Xavier University (1960) and a Ph.D. in Political Science from New York University (1970).

 Many believe that the only sustainable rationale for a government-funded program of human spaceflight is to take the lead in exploring the solar system beyond low-Earth orbit.20 The MIT white paper provides an insightful definition of exploration: Exploration is a human activity, undertaken by certain cultures at certain times for particular reasons. It has components of national interest, scientific research, and technical innovation, but is defined by none of them. We define exploration as an expansion of the realm of human experience, bringing people into new places, situations, and environments, expanding and redefining what it means to be human. What is the role of Earth in human life? Is human life fundamentally tied to the earth, or could it survive without the planet? Human presence, and its attendant risk, turns a spaceflight into a story that is compelling to large numbers of people. Exploration also has a moral dimension because it is in effect a cultural conversation on the nature and meaning of human life. Exploration by this definition can only be accomplished by direct human presence and may be deemed worthy of the risk of human life.21 In the wake of the 2003 Columbia accident that took the lives of seven astronauts and the report of the Columbia Accident Investigation Board that criticized the absence of a compelling mission for human spaceflight as “a failure of national leadership,”22 the United States, in January 2004, adopted a new policy to guide its human spaceflight activities. The policy directed NASA to “implement a sustained and affordable human and robotic program to explore the solar system and beyond” and to “extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations.”23 This policy seems totally consistent with the definition of exploration provided in the MIT white paper.

## Exploration – NASA Caselist

### NASA lists technologies of what it constitutes as space exploration

NASA 11 (05.23.11 “Exploration Technology Development Program” http://www.nasa.gov/exploration/acd/technology\_dev.html)

The Exploration Technology Development Program (ETDP) develops long-range technologies to enable human exploration beyond Earth orbit. ETDP also integrates and tests advanced exploration systems to reduce risks and improve the affordability of future missions. Exploration Technology Development Projects The projects in the ETDP were formulated to address the high priority technology needs for human spaceflight. All technology projects are managed at NASA Centers. Advanced In-Space Propulsion: This project develops concepts, technologies, and test methods for high-power electric propulsion and nuclear thermal propulsion systems to enable low-cost and rapid transport of cargo and crew beyond low Earth orbit. Autonomous Systems and Avionics: This project develops and demonstrates integrated autonomous systems capable of managing complex operations in space to reduce crew workload and dependence on support from Earth. Technologies will address operations in extreme environments, efficient ground-based and on-board avionics systems and operations, and cost-effective human-rated software development. Cryogenic Propellant Storage and Transfer: This project develops technologies to enable long-duration storage and in-space transfer of cryogenic propellants. Technology development includes active cooling of propellant tanks, advanced thermal insulation, measurement of propellant mass, liquid acquisition devices, and automated fluid couplings for propellant transfer between vehicles. Entry, descent and landing technology Entry, Descent, and Landing (EDL) Technology: This project develops advanced thermal protection system materials, aerothermodynamics modeling and analysis tools, and concepts for aerocapture and atmospheric entry systems for landing large payloads safely and precisely on extra-terrestrial surfaces and returning to Earth. › Read about the Mars Science Laboratory Entry, Descent, and Landing Instrument (MEDLI) Suite Extravehicular Activity Technology: This project develops component technologies for advanced space suits to enable humans to conduct "hands-on" surface exploration and in-space operations outside habitats and vehicles. Technology development includes portable life support systems, thermal control, power systems, communications, avionics, and information systems, and space suit materials. High-efficiency space power systems High-Efficiency Space Power Systems: This project develops technologies to provide low-cost, abundant power for deep-space missions, including advanced batteries and regenerative fuel cells for energy storage, power management and distribution, solar power generation, and nuclear power systems. A major focus will be on the demonstration of dual-use technologies for clean and renewable energy for terrestrial applications. Astronaut and Robonaut Human Robotic Systems: This project develops advanced robotics technology to amplify human productivity and reduce mission risk by improving the effectiveness of human-robot teams. Key technologies include teleoperation, human-robot interaction, robotic assistance, and surface mobility systems for low-gravity environments. Early demonstrations will focus on human teams interacting with multiple robotic systems. Longer-term demonstrations will focus on enabling operations in remote, hostile environments with limited support from Earth. In-Situ Resource Utilization: This project will enable sustainable human exploration by using local resources. Research activities are aimed at using lunar, asteroid, and Martian materials to produce oxygen and extract water from ice reservoirs. A flight experiment to demonstrate lunar resource prospecting, characterization, and extraction will be considered for testing on a future robotic precursor exploration mission. Concepts to produce fuel, oxygen, and water from the Martian atmosphere and from subsurface ice will also be explored. › About in-situ resource utilization (ISRU) field testing in Mauna Kea, Hawaii Life Support and Habitation Systems: This project develops technologies for highly reliable, closed-loop life support systems, radiation protection technology, environmental monitoring and control technologies, and technologies for fire safety to enable humans to live for long periods in deep-space environments. Lightweight Spacecraft Materials and Structures: This project develops advanced materials and structures technology to enable lightweight systems to reduce mission cost. Technology development activities focus on structural concepts and manufacturing processes for large composite structures and cryogenic propellant tanks for heavy lift launch vehicles, and on fabric materials and structural concepts for inflatable habitats. Advanced Exploration Systems Projects Advanced exploration systems incorporate new technologies to enable future capabilities for deep space exploration. Prototype systems are demonstrated in ground tests and flight experiments. Multi-Mission Space Exploration Vehicle: This project is developing a prototype crew excursion vehicle to enable exploration of Near Earth Asteroids and planetary surfaces. Deep Space Habitat: This project is developing concepts and prototype subsystems for a habitat that will allow the crew to live and work safely in deep space. Autonomous Precision Landing Systems: This project is developing optical sensors, and navigation and control algorithms to enable the capability for autonomous precision landing on the Moon or Mars. The autonomous precision landing system will be demonstrated in flight tests of a small lander. › About the Sensors Advance Lunar Landing Project Analogs: This project is demonstrating prototype systems and operational concepts for exploration of Near Earth Asteroids and Mars in simulations, desert field tests, underwater environments, and ISS flight experiments. › About analog missions and field testing

## Exploration = Feasible location

### Exploration must be feasible, accessible location- Moon, Mars and near earth objects

Jeremy Curtis 9 et al, the United Kingdom's delegate to the International Space Exploration Coordination Group, December 2009, Space exploration review-British National Space Center, Prof Louise Harra (Mullard Space Science Laboratory, UCL) Prof John Zarnecki (Open University) Prof Monica Grady (Open University) Charlotte Duke – Economics Team Leader Rodney Buckland (independent consultant) Prof Keith Mason (Chairman UK Space Board, CEO STFC) – Chairman Dr David Williams (DG BNSC) Dr David Parker (Director Space Science and Exploration, BNSC) Mark Beatson (Head of Science and Innovation Analysis, DIUS, now BIS) Lord Alec Broers (independent member)

In the context of this report space exploration encompasses the region of the solar system that is accessible to human beings using currently feasible technology (or to reiterate the Global Exploration Strategy, *'Solar System destinations where humans may one day live and work'*). This includes the Moon, Mars, certain Near Earth Objects (asteroids) and particular regions of space from Low Earth Orbit (LEO) through to the various libration points in the Earth-Moon and Earth-Sun systems. These latter locations have special properties and uses (see box on p22). Excluded from this definition of space exploration is the purely scientific exploration of the outer Solar System (since we cannot yet build space vehicles able to carry and protect astronauts on such voyages), as well as space-based observatories used to study the stars and universe beyond. Likewise unmanned satellites in Earth orbit are excluded – for example those providing Earth observation, communications and navigation services). Both robotic and human activities are included – exploration *per se* does not favour one over the other, though in many cases a combination of both is the best approach. Space exploration within this definition encompasses projects which may combine in varying degrees scientific, technological, cultural and economic goals. Example goals include science objectives such as the study of lunar geology to understand the history of the Earth; technology demonstrations, such as testing new communication techniques; and commercial projects such as the search for usable mineral resources on the Moon or Near Earth Objects.

### Exploration includes activities in low earth orbit

Lester and Robinson 9 Daniel F. Lester, Michael Robinson, Department of Astronomy C1400, University of Texas, Austin, TX 78712, USA b Hillyer College, University of Hartford, Visiions of Exploration, Space Policy 25 (2009), p. 237 LS

While these statements provide context, they do little to advance our deeper understanding of exploration and its implications for space policy. The CAIB report defined Columbia’s astronauts as explorers even though the crew never left low-Earth orbit, a region traveled by hundreds of other astronauts prior to STS-107.

## Exploration = Deep Space

### Must explore deep space

Harrison Schmitt, 2003 Chairman Of Interlune-Intermars Initiative Astronaut before the Senate Commerce, Science, and Transportation Committee's Subcommittee on Science ,“Testimony on the Commercial Development of Lunar Resources”, 2003

The term "space exploration" implies the exploration of the Moon, planets and asteroids, that is, "deep space," in contrast to continuing human activities in Earth orbit. Human activities in Earth orbit have less to do with exploration and more to do with international commitments, as in the case of the Space Station, and prestige and technological development, as in the case of China and Russia. There are also research opportunities, not fully recognized even after 40 years, that exploit the opportunities presented by being in Earth orbit.

## Tech is not exploration

### Technology development isn’t exploration of space- it’s exploitation

Charles D. Walker,= President N.S.S., 1992 WHY WE EXPLORE SPACE

Then, to me, there is the material need to explore space. This, as a rationale, is certainly not as intuitively obvious as the psychological need. It is on a "real" level though, and makes for the kind of compelling justification that politicians and managers must have to get resources. "Ah", as the Bard wrote, "there's the rub!" It's necessary but not obvious. But wait, one might say, communications satellites and environmental sensing space platforms are obviously necessary. I will agree. But I will also quickly point out that those are not space exploration; they are, historically, exploration but currently they are exploitation. They are taken for granted and will continue as such. I am pointing here to the further, as yet largely unrecognized and certainly unfulfilled, exploration of space and the other worlds there for useable natural and technical resources. The Moon may be the site for truly cheap, inexhaustible energy for the growing human civilization here on Earth. But, just the act of returning to the Moon to find out will develop new technological resources as "spin-offs" for that civilization to use immediately. The act of exploration has always yielded technical benefits to human societies. That fact, and the need to continue exploring, have not changed.

## Exploration = Humans

### Exploration includes robots and humans

S.Y. Chung et al a, P. Ehrenfreund a,\*, J.D. Rummel b, N. Peter c, June 2009; “Synergies of Earth science and space exploration”, Space Policy Institute, Elliott School of International Affairs

The term “space exploration” encompasses both robotic and human exploration activities. Using ESA’s definition from the document entitled: European Objectives and Interests in Space Exploration (ESA, 2007), space explora- tion is defined as to “extend access and a sustainable pres- ence for humans in Earth–Moon–Mars space, including the Lagrangian Points and near-Earth objects.”

### Humans key to space exploration

Lester and Robinson 9 Daniel F. Lester, Michael Robinson, Department of Astronomy C1400, University of Texas, Austin, TX 78712, USA b Hillyer College, University of Hartford, Visiions of Exploration, Space Policy 25 (2009), p. 240 LS

Within the political sphere, space exploration gains its relevance largely through symbolism, both as a human quest and a geopolitical strategy. Of the half dozen campaign speeches that mentioned space flight at the 2008 Democratic National Convention, none mentioned science. For all of them space flight was useful as a measure of human (and more specifically American) achievement. In the Republican campaign arena, John McCain’s policy statement about exploration was quite revealing: Although the general view in the research community is that human exploration is not an efficient way to increase scientific discoveries given the expense and logistical limitations, the role of manned space flight goes well beyond the issue of scientific discovery and is a reflection of national power and pride [22]. In the national conversation about the meaning of space exploration, not much has changed since the Augustine Commission considered these questions in 1990 [23]. ‘‘Some point out that most space science missions can be performed with robots for a fraction of the cost of humans’’, they said, ‘‘and that therefore the manned space program should be curtailed. Others point out that the involvement of humans is the essence of exploration, and that only humans can fully adapt to the unexpected.’’

### Space exploration with humans dangerous- Exploration includes more than trips to land masses – free space is included in exploration

Lester and Robinson 9 Daniel F. Lester, Michael Robinson, Department of Astronomy C1400, University of Texas, Austin, TX 78712, USA b Hillyer College, University of Hartford, Visiions of Exploration, Space Policy 25 (2009), p. 240 LS

This penchant for visiting rocks in the name of ‘‘exploration’’ leaves many kinds of space science at a disadvantage. Certainly, for astronomy, it is well understood that free space is far more enabling for most telescopes than the lunar surface [25]. The EartheSun second Lagrange point, for example, is the operational location of choice for a host of new astronomy missions and mission concepts. This location, about four times the lunar distance anti-sunward from the Earth offers extraordinary thermal stability, with continuous power and line-of-sight communication. While it is often said that having humans on the lunar surface offers special opportunities for large science instruments there, it is rarely acknowledged that getting those humans onto the lunar surface is probably far more risky than getting them almost anywhere else in cis lunar space. What if Lagrange points were culturally acceptable as prime targets for human exploration?

### Exploration is sending humans deeper into space

nasa.gov 6/16

Lind, Rocky, and Sarah Loff. "NASA - Human Space Exploration." *NASA - Home*. 16 June 2011. Web. 23 June 2011. <http://www.nasa.gov/exploration/home/index.html>. mes

This is the beginning of a new era in space exploration where we will build the capabilities to send humans deeper into space than ever before.

## Excludes SETI

### Exploration and use excludes passive SETI and astronomy – international law proves

Lyall 98 Professor of Public Law. Member IISL. University of Abderdeen Acta Astronautica, Volume 42, Issues 10-12, May-June 1998, Pages 661-665

 Under the general concept of state sovereignty it is for a state to regulate what is done within its jurisdiction. On that basis it is for municipal law to determine the lawfulness of SETI activity, and, for its own purposes to regulate what is done. Passive SETI, if I may so call the simple reception and analysis of signals, could be classified as a matter lying wholly within the jurisdiction of a state. Can one argue that it is an activity in outer space, which is the gravamen of the UN treaties? I think not. However, one could say that it crawls into the international arrangements as being part of the “exploration” of space which is dealt with internationally. However, if that is the case then visual astronomy must also qualify. Certainly astronomy has an interest, for space debris, not to mention space art, can affect astronomers. I would not consider this enough to sweep astronomy into the activities subject to the Outer Space Treaty.

## Space Ex – Ambiguity Good

### Ambiguity is desirable when dealing with “exploration”

Lester and Robinson 9 Daniel F. Lester, Michael Robinson, Department of Astronomy C1400, University of Texas, Austin, TX 78712, USA b Hillyer College, University of Hartford, Visiions of Exploration, Space Policy 25 (2009), p. 239  LS

In truth, the ambiguity of the term ‘‘exploration’’ has certain advantages, particularly from the perspective of funding and policy making. Because funding of NASA budgets requires broad agreement in Congress, the fuzziness of exploration often avoids triggering debates that would weaken political support. ‘‘In the political realm, it’s not desirable to have too precise a definition’’, according to Scott Hubbard, Stanford Professor of Engineering and Former Director of NASA Ames Research Center, with respect to exploration. Within this environment, explains Hubbard, defining exploration too narrowly ‘‘is not without some peril’’. Ian Pryke, Senior Fellow at George Mason University and Former Head of the European Space Agency’s Washington Office, speaks in similar terms about the word. ‘‘A little bit of constructive ambiguity never hurts.’’ [19].

# Space Development

## Dev - Includes LEO

### Space development includes Low Earth Orbit technology

Feng Hsu, PhD, Sr. Fellow, Aerospace Technology Working Group and Ken Cox, Ph.D. Founder & Director Aerospace Technology Working Group, 2/20/09, “Sustainable Space Exploration and Space Development - A Unified Strategic Vision”, http://www.spaceref.com/news/viewsr.html?pid=30702//jchen

3. A Unified Vision for Concurrent Space Exploration and Space Development

We propose herein, and call for such a strategic and grand unified vision for both space exploration (VSE) and space development (VSD). This new unified space vision (USV) should be a comprehensive and balanced approach that addresses the long-term concurrent needs of space and science explorations, as well as the needs for space-based human economic development, which will benefit all of humanity while fostering world peace. It is a new paradigm of space vision with four critical strategic components: (1) A vision of sustainable and affordable space exploration efforts that aims at probing for and discovery of unknown (or known) planetary destinations beyond the earth-moon system. Under this foresight, the space-access developments within LEO (low Earth orbit), including major elements of the constellation program from the Bush VSE, need to be regarded as space (economic) development activities to be achieved via international partnerships.

## Dev - Includes NASA Moon Missions

### Space development includes NASA moon missions

Feng Hsu, PhD, Sr. Fellow, Aerospace Technology Working Group and Ken Cox, Ph.D. Founder & Director Aerospace Technology Working Group, 2/20/09, “Sustainable Space Exploration and Space Development - A Unified Strategic Vision”, http://www.spaceref.com/news/viewsr.html?pid=30702//jchen

The U.S. should adopt a renewed vision for space exploration (VSE) that aims at returning the U.S. to the forefront in space and leading humanity's space exploration challenges to new frontiers, rather than repeating what the nation and mankind did with the original moon landings. Under this vision, we recommend reform of NASA, the establishment of DOS, and adoption of a strategic and unified vision for a comprehensive and concurrent effort in space (implementing both VSE & VSD) for the nation's space endeavors. In this strategy, we propose that the current NASA effort of returning to the moon should be regarded as part of human Space Development**,** to be managed by DOS, which is a key element of overall space transportation infrastructure development activities for human economic and commercial expansion into the Earth-Moon orbit systems.

## Dev = Usage

### Space development enables the usage of space for the prosperity of humankind

Tamiya Nomura, Deputy Chairman of the Space Activities Commission , “Japan's new long-term vision Creating a space age in the new century”, Space Policy Volume 11, Issue 1, February 1995, Pages 9-17, http://www.sciencedirect.com/science/article/pii/026596469593230I//jchen

The Japanese Government's Space Activities Commission (SAC) has released its latest Long-Term Vision of Japan's future in the exploration and use of outer space. The Vision will contribute to the formulation of government policy for space development. In this article, the philosophy of space development is defined as follows: ‘It enables space to be used as the common property of all mankind in order to contribute to the enduring prosperity of all those living on Earth.’ Within this philosophy, Japan's principal objectives are projected into the middle of the twenty-first century as being: construction of a global Earth observation system; promotion of advanced space science programmes; full implementation of space activities using the Japanese Experiment Module of the International Space Station; and development and operation of new space infrastructures.

## Dev = R&D

### Space development includes R+D and activities to facilitate exploration

SDPA 5 (Space Development Promotion Act of the Republic of Korea, Journal of Space Law, 33, 5-31, <http://www.spacelaw.olemiss.edu/library/space/Korea/Laws/33jsl175.pdf>)

Article 2 (Definitions)

Definitions of terms used in this Act are as follows: (a) The term “space development” means one of the following: (i) Research and technology development activities related to design, production, launch, operation, etc. of space objects; (ii) Use and exploration of outer space and activities to facilitate them; (b) The term “space development project” means a project to promote space development or a project to pursue the development of education, technology, information, industry, etc. related to space development; (c) The term “space object” means an object designed and manufactured for use in outer space, including a launch vehicle, a satellite, a space ship and their components; (d) The term “space accident” means an occurrence of damage to life, body or property due to crash, collision or explosion of a space object or other situation; (e) The term “satellite information” means image, voice, sound or data acquired by using a satellite, or in formation made of their combination, including processed or applied information.

### R+D, testing, and evaluation

Rau 99 (Russell A., Assistant Inspector General, “Earned Value Management at NASA”, Audit Report, 9-30, <http://oig.nasa.gov/audits/reports/FY99/pdfs/ig-99-058.pdf>)

2 NASA is substituting the word “development” for “research, development, test, and evaluation” in the subsequent version of NPD 9501.3.

## Development = peaceful

### “Space development” is creating hardware for peaceful purposes --- includes satellites and launch vehicles

Hwang 6 (Chin Young, Policy and International Relations Division – Korea Aerospace Research Institute, “Space Activities in Korea—History, Current Programs and Future Plans”, Space Policy, 22(3), August, p. 199)

Space development in Korea has several characteristics. First, space development activities are initiated by a scientific research institute, KARI, and a university, KAIST SaTRec, for peaceful purposes. Most development projects have been proposed by research institutes, not government decision makers. Second, most satellite missions are multipurpose. Since space development has not been initiated by the top levels of government, funding has to be sought by research institutes and MOST. In order to get enough funds, missions must be able to meet various requirements of related ministries. At the same time, each space development project has to justify its feasibility in terms of an economic cost–benefit analysis. Third, Korean space activities have been focused on hardware—development of satellites and launch vehicles—rather than on the development of a full vision and the missions that would accompany this. The national space development plan reflects these characteristics, even though it contains some mention of space science and manned missions to the ISS through the international cooperation program.

## Development Inclusive Defs

### “Development” includes many specific activities

Hsu 9 (Feng, Ph.D. and Senior Fellow – Aerospace Technology Working Group, and Ken Cox, Ph.D. and Founder & Director – Aerospace Technology Working Group, “Sustainable Space Exploration and Space Development - A Unified Strategic Vision”, 2-20, <http://www.spacerenaissance.org/papers/A-UnifiedSpaceVision-Hsu-Cox.pdf>)

In our view, even with adequate reform in its governance model, NASA is not a rightful institution to lead or manage the nation's business in Space Development projects. This is because human space development activities, such as development of affordable launch vehicles, RLVs, space-based solar power, space touring capabilities, communication satellites, and trans-earth or trans-lunar space transportation infrastructure systems, are primarily human economic and commercial development endeavors that are not only cost-benefit-sensitive in project management, but are in the nature of business activities and are thus subject to fundamental business principles related to profitability, sustainability, and market development, etc. Whereas, in space exploration, by its nature and definition, there are basic human scientific research and development (R&D) activities that require exploring the unknowns, pushing the envelope of new frontiers or taking higher risks with full government and public support, and these need to be invested in solely by taxpayer contributions.

### “Space development” includes launch vehicles, ISS development, and remote sensing satellites

Collins 2 (Patrick, Azabu University, “The Cost to Taxpayers of Governments' Anti-Space Tourism Policy and Prospects for Improvement”, [http://www.spacefuture.com/archive/pending/the\_cost\_to\_taxpayers\_of\_governments \_anti\_space\_tourism\_policy\_and\_prospects\_for\_improvement.shtml](http://www.spacefuture.com/archive/pending/the_cost_to_taxpayers_of_governments%20_anti_space_tourism_policy_and_prospects_for_improvement.shtml))

As a result, out of space agencies' cumulative funding to date of some $1 trillion, almost nothing has been spent to promote the development of passenger space travel ? although they have acknowledged that this is the only activity that will lead to commercialisation of space activities and hence to economic growth in space. Although space agencies are formally responsible for the commercial development of space, in reality they do no more than try to sell systems they have developed for political reasons. This is entirely different, and economically it is a costly failure. G7 governments' claim thay they are working to commercialise space activities is untrue: they are in fact using taxpayers' money under false pretences. Since the author's ISTS 2000 paper [15] G7 governments have spent a further $36 billion on a range of non-science 'space development' activities, centring on unprofitable expendable launch vehicles, unprofitable e international space station' development, and further unprofitable over-investment in remote sensing satellite systems. Over the same period they have once again spent almost nothing on work relevant to passenger travel.

### “Space development” includes launching objects and operating satellites

Kwanbo 7 (South Korean Publication, “Space Damages Compensation Act”, Global Legal Information Network, 12-21, <http://www.glin.gov/view.action?glinID=205544>)

There is a rising need to prepare for space accidents. The probability of such accidents has increased as countries around the world have actively pursued space development and private companies that use satellites are appearing. However, it is inappropriate to apply liability with negligence under the civil act to compensate for damages resulting from space accidents considering that space technology engenders many cutting-edge fields such as aerospace, electricity & electronics, telecommunications, and advanced materials. Also, payments for damages would be astronomical: forcing the payment in its entire amount would hinder the private sector's participation in the space development business. The need for a new compensation scheme is clear. This act is intended to set up specific standards and procedures such as the scope of compensation for damages and limits of responsibility for space accidents related to space development activities such as launching of space objects and operating of satellites.

### Development of space means industrial applications in space – includes mining and production in space

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Man's exploration of space is often analogized to his exploration of the ancient oceans. Ancient sea-explorers faced obstacles of uncharted oceans and land. They also faced difficulties in finding the means and financing to make their discoveries. Space industrial development suffers difficulties as well, however, many of the difficulties are legal obstacles. This author [n1](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n1) and numerous legal authorities [n2](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n2) have asserted that international space law presently hinders the commercial development of outer space, and thus, requires legal change. Vigorous space commercial development is crucial, however, not for intellectual development alone. [n3](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n3) It offers massive economic, [n4](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n4) medical, [n5](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n5) industrial, [n6](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n6) and humanitarian rewards. [n7](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n7)  [\*261]  Better vaccines and antibiotics can be produced in space in far greater quantities than on earth. [n8](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n8) Mining the moons, [n9](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n9) asteroids, [n10](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n10) and comets [n11](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n11) provides answers to future energy depletion and would provide enormously less expensive construction of spacecraft and colonies than launching from Earth. [n12](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n12) Space industry also paves the way in addressing future crises both manmade [n13](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n13) and natural. [n14](http://0-www.lexisnexis.com.library.lausys.georgetown.edu/lnacui2api/%22%20%5Cl%20%22n14)

## Dev = Commercial Space

### In the context of USFG space policy development is commercial. Prefer our evidence it provides a substantial caselist based on empirical examples.

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EVOLUTION OF COMMERCIAL SPACE POLICY Policy statements encouraging commercial space development began appearing in the Carter Administration, but the first real attempts at a comprehensive US government policy toward space commerce came in the 1980s. This was driven by technology maturation, market demand for satellite communications and launch services, and expectations of profits in new areas such as remote sensing and materials processing. Policies addressing different segments of the commercial space sector have already been discussed, but the Reagan Administration's 1988 National Space Policy was the first presidential directive to recognize space commerce as a distinct sector of space activity and to establish guidelines for supporting it. The Bush (89) and Clinton Administrations later adopted much of the same wording, with minor embellishments. The essential elements of presidential guidance since the late 1980s direct the US government to: support and enhance US economic competitiveness in space activities; purchase commercially available space goods and services to the fullest extent feasible; refrain from activities with commercial applications that preclude or deter commercial space activities, except for reasons of national security or public safety; pursue commercial space objectives without the use of direct federal subsidies; supervise or regulate commercial space activities only to the extent required by law, national security, international obligations, and public safety; facilitate commercial-sector access to US government space-related hardware, facilities, and data; enter into appropriate cooperative agreements while protecting the commercial value of intellectual property; identify portions of US laws and regulations that unnecessarily impede the commercial space sector, and propose amendments or elimination; provide for timely transfer of government-developed space technology to the private sector, including protection of its commercial value and retention of data rights by the private sector; and support trade policies that encourage a competitive international environment for space commerce. Many of these ideas were codified into congressional law with the passage of the Commercial Space Act of 1998, Public Law 105-303. This act calls for the US government to encourage the development of a commercial space industry in a number areas ranging form the commercialization of the International Space States (ISS); removal of barriers to applications of GPS; treatment and acquisition of space science data as a commercial item; and requirements for government procurement of commercial space transportation services. In response to this Act, NASA has developed plans for commercializing ISS and strategies for developing space commerce.

### Space development is expansion of commercial space projects

Eric Westling, guest on the space show 9/11/07, http://www.thespaceshow.com/guest.asp?q=298//jchen

Eric Westling is a science writer, pundit on science, technology, and economics. He is the co-author of "The Space Elevator” with Dr. Brad Edwards . In addition, Mr. Westling is retired and is a former Army officer and helicopter pilot, civilian Airline Transport Pilot (ATP), former consultant to many small companies regarding engineering, computer, and business troubleshooting. His most recent papers are on Solar Power Satellites, Economics of the Space Elevator, Energy and time lag in the 21st century , and Eric’s axioms (a list of principles of science, technology and economics). Mr. Westling stats that “Space Development is the only long term answer to the, just starting, energy shortage; which will otherwise continue until we have an economic collapse.” He believes that no-one is doing space development . Instead, we have space technology, not development. NASA has no TRL 10 – therefore no plans to develop space . He defines space development as the rapid expansion of manned commercial projects in space.

## Dev = colonization

### Space development means expanding human civilization

I A Crawford 1995 based at the Department of Physics and Astronomy, University Col- lege London, Gower Street, London, UK, Space development: social and political implications SPACE POLICY November 1995 219

In this essay I wish to explore some of the social and political issues likely to lie behind any large-scale future programme of space exploration and development. For the purposes of this discussion, I intend 'large-scale' to mean a programme of space development on a scale sufficient to make possible, over the next few centuries, the economic utilisation of the Solar System, the colonisation of other planets, and, eventually, the development of an interstellar spaceflight capability. I am aware that many self-styled 'realists' will react against such an apparently utopian agenda but it seems to me that something along these lines must be the ultimate aim of any meaningful future human space programme. After all, we already have most of what we need for satellite communications, earth resource surveys, and space astronomy, so discussion of major new technical and institutional initiatives makes sense only if we acknowledge that the ultimate aim of space development is something much more ambitious - the expansion of human civilisation into the Solar System and beyond.

# Other

## Depth > Breadth – Studies

### Studies prove – depth is better than breadth.

**Arrington ‘9** (Rebecca, UVA Today, “Study Finds That Students Benefit From Depth, Rather Than Breadth, in High School Science Courses” March 4)

A recent study reports that high school students who study fewer science topics, but study them in greater depth, have an advantage in college science classes over their peers who study more topics and spend less time on each. Robert Tai, associate professor at the University of Virginia's Curry School of Education, worked with Marc S. Schwartz of the University of Texas at Arlington and Philip M. Sadler and Gerhard Sonnert of the Harvard-Smithsonian Center for Astrophysics to conduct the study and produce the report. "Depth Versus Breadth: How Content Coverage in High School Courses Relates to Later Success in College Science Coursework" relates the amount of content covered on a particular topic in high school classes with students' performance in college-level science classes. The study will appear in the July 2009 print edition of Science Education and is currently available as an online pre-print from the journal. "As a former high school teacher, I always worried about whether it was better to teach less in greater depth or more with no real depth. This study offers evidence that teaching fewer topics in greater depth is a better way to prepare students for success in college science," Tai said. "These results are based on the performance of thousands of college science students from across the United States." The 8,310 students in the study were enrolled in introductory biology, chemistry or physics in randomly selected four-year colleges and universities. Those who spent one month or more studying one major topic in-depth in high school earned higher grades in college science than their peers who studied more topics in the same period of time. The study revealed that students in courses that focused on mastering a particular topic were impacted twice as much as those in courses that touched on every major topic.

## Space Limits Cards

### Nasa does tons of missions – limits are especially important on this topic

NASA 10[National Aeronautics and Space Administration, “About NASA” <http://www.nasa.gov/about/highlights/what_does_nasa_do.html>, 2/1/10]

NASA Today NASA conducts its work in four principal organizations, called mission directorates: Aeronautics: pioneers and proves new flight technologies that improve our ability to explore and which have practical applications on Earth. Exploration Systems: creates capabilities for sustainable human and robotic exploration. Science: explores the Earth, solar system and universe beyond; charts the best route of discovery; and reaps the benefits of Earth and space exploration for society. Space Operations: provides critical enabling technologies for much of the rest of NASA through the space shuttle, the International Space Station and flight support. In the early 21st century, NASA's reach spans the universe. Spirit and Opportunity, the Mars Exploration Rovers, are still studying Mars after arriving in 2004. Cassini is in orbit around Saturn. The restored Hubble Space Telescope continues to explore the deepest reaches of the cosmos. Closer to home, the latest crew of the International Space Station is extending the permanent human presence in space. Earth Science satellites are sending back unprecedented data on Earth's oceans, climate and other features. NASA's aeronautics team is working with other government organizations, universities, and industry to fundamentally improve the air transportation experience and retain our nation's leadership in global aviation. The Future NASA is making significant and sustained investments in: Transformative technology development and demonstrations to pursue new approaches to space exploration, including heavy-lift technologies; Robotic precursor missions to multiple destinations in the solar system; U.S. commercial spaceflight capabilities; Extensions and increased utilization of the International Space Station; Cross-cutting technology development in a new Space Technology Program; Climate change research and observations; NextGen and green aviation; and Education, including focus on Science, Technology, Engineering and Math (STEM).