Aff Plan Texts:

“The Commons” Aff

“Fidelity” Aff

Resolved: The appropriation of outer space by private entities is unjust. The affirmative defends the truth of an unjust practice but doesn’t defend a specific practice of what the next move is. Space is the domain needed for capital to extend surplus into while also being a new locus for exploitation

“Pragmatism” Aff

# Neg

# Counterplans

## 1nc Public Trust

#### States should declare that public guardianship obligations created by the non-ownership doctrine necessitate a reduction in private actor appropriation of Outer Space.

#### The public trust doctrine is inseparable from an anthropocentric politics of human chauvinism – further application can only strengthen exploitative relationships to nature – guardianship asserts the doctrine of non-ownership, which solves better and competes

Adler 05, Dean College of Law at Utah (Robert, The Law at the Water's Edge: Limits to ""Ownership"" of Aquatic Ecosystems, in Wet Growth: Should Water Law Control Land Use?, pg. 244)

gue instead that the idea of a public “trust” should be replaced by one of public “guardianship.” In a classic trust, legal and equitable title are held by different persons, and the person with legal title has “equitable duties to deal with the property for the benefit of another person.” The trust duty is fiduciary and typically requires the trustee to maximize the income or other economic value of the trust assets for the beneficiary. This principle implies that if the trustee believes that a particular asset is better used for another purpose, or that certain trust values are more valuable than others from the perspective of the beneficiary, the trustee can manage the trust assets accordingly or even eliminate the resource entirely. Viewed again according to the underlying theory or property ownership, that landowners will make decisions that maximize the welfare value of the holding, public trust ownership solves some, but not all, of the market failure problems of private ownership. Under the expanded version of the public trust doctrine as interpreted by some courts, the trustee is now supposed to ensure that all common public values, including noncommodified environmental values that benefit the public in some way, are considered fully and appropriately and weighed against values that might benefit a subset of society or even an individual landowner disproportionately. If private market participants exert undue influence on the government’s decision process in the exercise of its trust, however, those decisions may not necessarily maximize overall welfare. Give the deference usually enjoyed by trustees absent clear violations of the trust duty, many courts are not likely to interfere with those judgements. Even absent such biasing of the trustee’s decision, a trustee may simply, in the exercise of its fiduciary judgement, determine that the commercial value of a particular piece of trust property is more valuable to the beneficiary than its environmental value, a decision more likely to be reviewed by courts from a procedural, rather than a substantive, perspective. Moreover, to the extent that trust resources provide ecosystem or other values or benefits that transcend the welfare of human societies, the public trust doctrine, - and trust law in general - is not even designed to incorporate those values. In fact, a public trustee arguably would violate its fiduciary duty to the public beneficiary if it considered environmental values at the expense of the immediate (current generation) public beneficiaries. One solution to that dilemma would be to consider the beneficiaries to include future as well as current generations of humans, but the inherently anthropocentric focus of the trust duty remains. Thus, while some courts have upheld government regulation and even prohibition of private development of land at the water's edge, under interpretations of the public trust doctrine and police power that affirm environmental stewardship duties; others have applied the doctrine as one that merely ensures that the trustee makes rational decisions after properly considering all trust values. 174 Other courts have ap­plied the doctrine to sanction the very economic development activities at the water's edge that cause such extensive aquatic ecosystem harm, such as the use of trust property for transportation systems, public utilities, oil production, and urban and commercial expansion. So long as the law considers aquatic species and other components of aquatic eco­systems to be "trust assets" to be managed entirely for the benefit of human economic and other welfare, aquatic ecosystems will remain vulnerable to continued impairment. A potentially more satisfying model, as discussed in the next section, is suggested by the evolution of wildlife law from one in which wildlife was similarly viewed as being "owned" by the state in trust for the people in common to one of "non­ownership." The non-ownership doctrine implies a corollary principle that the government is a guardian, rather than a trustee, of the resource and must exercise its legal responsibilities accordingly.

#### Nonownership solves better has a sound legal basis and effectively advances rights for nature – the aff maintains anthropocentric legal doctrine

Adler 07, Dean College of Law at Utah (Robert, RESTORING COLORADO RIVER ECOSYSTEMS: A Troubled Sense of Immensity, pg. 199-200)

The public trust doctrine, however, retains the anthropocentric focus of property law in which “trust assets” are held by the government for the common benefit of human users. Perhaps the bigger problem is that the ecological values inherent in aquatic ecosystems are not amenable to either private or public ownership. The concept of “nonownership” has an equally long legal history, but has not received the same scholarly or judicial attention outside the arena of wildlife law. Some scholars read the original Roman law to mean that some common resources cannot be owned *at all*. Private individuals cannot “own” wildlife even if wild animals reside on their land. Individuals may own domesticated animals reduced to human control and wild animals reduced to physical possession through hunting or capture. No one can “own” a species, however, or even a population of wild animals. A rancher might own domesticated horses but not the wild mustangs grazing on her land. The U.S. Supreme Court clung for many years to the notion that states owned wildlife in trust for their people, but gradually abandoned this concept. In Missouri v. Holland, Justice Oliver Wendell Holmes questioned the idea that state "ownership" of birds that migrate across state lines could impair federal regulatory power: "To put the claim of the State upon title is to lean upon a slender reed. Wild birds are not in the possession of anyone; and possession is the beginning of ownership. The whole foundation of the State's rights is the presence within their jurisdiction of birds that yesterday had not arrived, tomorrow may be in another State and in a week a thousand miles away." In later cases the Supreme Court referred to the ownership concept as a "legal fiction" or "fantasy," and ultimately ruled that state authority to regulate wildlife is grounded in sovereign authority to protect common resources and the common welfare. It is not based on ownership. The nonownership principle conforms to a growing realization that nonhuman components of the natural world are not merely resources for human use and consumption, but have intrinsic value. Just as the law evolved in the 19th century to reject the idea that people could own slaves, law in the 20th century changed to conform with society's growing ethical rejection of human dominion over all other living species. At least since the early 1970s, some scholars began to propose legal rights for nonhuman species. The idea that wildlife cannot be owned also makes sense in light of the realization that species provide ecosystem services beyond those measured in the market economy. So what does this have to do with restoration of the Colorado River? No one claims ownership of razorback suckers or Yuma clapper rails. But private property rights at the water's edge limit the government's ability to restore the natural relationship between land and water. If inundation of private property constitutes an unconstitutional taking of property, modified dam flows that even periodically inundate riparian habitats or backwaters might be prohibited. Or, it might

#### Implementation of public trust doctrine protection will be arbitrary and capricious ensuring ecological harm. The counterplans application of non-ownership solves

Adler 05, Dean College of Law at Utah (Robert, The Law at the Water's Edge: Limits to ""Ownership"" of Aquatic Ecosystems, in Wet Growth: Should Water Law Control Land Use?, pg. 244)

There are several other ways in which the non-ownership doctrine as applied to aquatic ecosystem resources and values differs from the existing public trust doctrine and is likely to be a superior tool to protect those resources and values. First, while some courts have endeavored to "unshackle" the public trust doctrine from its historic limits, the doctrine is, for the most part, constrained by those artificial geographic boundaries, and litigants seeking to enforce the public trust face a significant burden to overcome those presumed boundaries. The non-ownership doctrine and its implied government guardianship is defined not by artificial geographic limits but by actual determinations of the degree to which aquatic ecosystem values and services exist. Second, as explained above, the nature of the guardianship duty is a more logical model for government control of resources that cannot be owned and suggests that those resources must be protected and cannot be conveyed either for private economic gain or for public economic gain at the expense of ecological harms. Third, and most importantly, relative to the public trust doctrine the burden of proof should be flipped. Rather than requiring the government to prove that it owns or otherwise controls a resource under the public trust doctrine in order to justify protection, a landowner presumptively has no rights to impair ecosystem components, values, or services in a significant way, meaning the burden of proof is on the landowner to demonstrate ownership rights, and not vice versa. Like the public trust doctrine, of course, the "non-ownership" doctrine could suffer the fate of other efforts to develop rules of resource protection through a state-by-state and case-by-case approach, with the possibility of the same type of doctrinal fragmentation among states. For several reasons, however, the legal doctrine of "non-ownership" could avoid this common-law odyssey. First, the non-ownership doctrine was pronounced by the Court in Hughes as a matter of federal law in the context of a constitutional ruling. If the Court were to apply that same doctrine in the context of a constitutional takings challenge, it could achieve national status without the need for an uncertain crosscountry journey. While the public trust doctrine often is attributed to the Court's rulings in cases like Illinois Central and Shively v. Bowlby, in fact it had its origins in earlier state cases, and the Court has ruled that the geographic reach and other aspects of the public trust doctrine are a matter of state law. It was this perhaps unfortunate conclusion that has relegated the public trust doctrine to such an uncertain fate. Second, with due respect to the tremendous innovation and influence of the modern rejuvenation of the public trust doctrine, in addition to the inherent limitations discussed above, its application to a larger geography and a broader scope of trust resources relies heavily on a somewhat subjective, amorphous set of judgments about what advances public trust values and how those values should be balanced against other resources and values, both public and private. To be sure, application of the "non-ownership" doctrine will require sometimes difficult case by case judgments, as do virtually all efforts to protect ecological resources, whether judicial or regulatory in method. The core governing principle of non-ownership, however, is amenable to a far greater degree of uniformity. As a matter of law, once it is recognized that private-property rights do not include the right to destroy or degrade aquatic ecosystem resources, the role of government as guardian of those resources, whether through judicial or regulatory action, is less open to the type of discretion that characterizes the public trust doctrine. Under the guardianship principle, the government's role is to protect, not to choose from among a large number of potentially competing uses.

#### The counterplan and the plan are mutually exclusive – application of the public trust doctrine establishes ownership while the counterplan is explicitly non-ownership. Severance permutations should be rejected because they eliminate all counterplan net benefits and disprove desirability of the plan

Adler 05, Dean College of Law at Utah (Robert, The Law at the Water's Edge: Limits to ""Ownership"" of Aquatic Ecosystems, in Wet Growth: Should Water Law Control Land Use?, pg. 244)

4. "Non-Ownership" of Wildlife: Consequences and Implications Several legal implications flow from the realization that states do not own wildlife populations but can regulate their use under inherent police power authority. First, and most obviously, if the sovereign cannot "own" wildlife species or populations (as opposed to individual members of a species when lawfully captured or killed under relevant federal and state laws and regulations), a fortiori neither do private landowners. This corollary, of course, is entirely consistent with the traditional "capture" doctrine in wildlife law, but for different and more fundamental reasons. Under traditional principles, individuals cannot own wildlife until it is reduced to physical possession, and hence control, through lawful kill or capture. Under the non-ownership doctrine as announced in Hughes and its predecessors, wildlife in its natural state is inherently incapable of ownership. Indeed, such ownership would then be inconsistent with the state's more appropriate status as a legal guardian of wildlife resources. If the state "owned" wildlife in the sense that one can own a mineral, presumably it would have the power to deplete it entirely if it determines that it is in the state's (and society's) best economic or other interests to do so. 207 If it only has the authority to regulate and protect the resource "as between a State and its inhabitants," it does so more in the position of a legal guardian rather than as a trustee "owner" with the rights normally attendant thereto. The guardianship analogy is still imperfect, but it is superior to the public trust notion with respect to the nonhuman values inherent in wildlife and other ecosystem resources and to the extent that those natural objects are viewed as having rights of their own. As a matter of property law, a "trustee ... has title to trust property; a guardian of property does not have title to the property, but has only certain powers and duties to deal therewith for the benefit of the ward, the ward having title to the property. "208 The state as guardian cannot confer on private individuals, through its system of property law or otherwise, an ownership interest in what it is guarding. Nor can it simply dispose of that "property." ln contrast, dispositions of trust property are restricted.

#### Expanding PTD causes recessions and destroys the environment – it shatters the entire legal-regulatory balance

Huffman 15 [James L. Huffman is Dean Emeritus of Lewis & Clark Law School and a Visiting Fellow at the Hoover Institution. He holds degrees from Montana State University (BS), The Fletcher School of Tufts University (MA) and the University of Chicago (JD). "WHY LIBERATING THE PUBLIC TRUST DOCTRINE IS BAD FOR THE PUBLIC." https://law.lclark.edu/live/files/19611-45-2huffman]

Since the beginning of the modern environmental movement in the 1960s, environmental advocates have been in search of ways to circumvent the twin obstacles of political compromise and vested property rights. In a 1970 article, Professor Joseph Sax suggested that the common law public trust doctrine might provide an avenue for judicial intervention in the name of claimed public rights in a wide array of natural resources. Because the traditional doctrine was narrowly limited in terms of both public rights and affected resources, Sax published a second article ten years later, calling for courts to liberate the public trust doctrine from its historical parameters. While a few judges responded with generally limited extensions of the doctrine, Sax’s plea has been ignored by most courts—but not by academics. A flood of law review articles have resorted to shoddy history, retrospective theorizing about the origins and purposes of the doctrine, appeals to higher law and moral imperatives, and confusion of the idea of public trust in representative government with the public rights protected by the public trust doctrine in efforts to persuade courts to liberate the doctrine. Implicit, if not explicit, in all of these arguments is the claim that the common law origins of American law and the American judicial system vest courts with authority to amend old law and make new law. At risk in this vast and imaginative effort to liberate the public trust doctrine from its common law confines are the constitutional separation of powers, the rule of law, due process and secure property rights, and the economic prosperity on which environmental protection ultimately depends.

#### Failed recovery causes global crises and extinction

McClennan ’21 [Marsh, writing with the SK and Zurich Insurance Groups; 2021; Global Professional Services firm, advised by the National University of Singapore, the Oxford Martin School at Oxford University, Wharton Risk Management and Decision Processes Center at the University of Pennsylvania; World Economic Forum, “The Global Risks Report 2021,” <https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf>]

Executive Summary

The immediate human and economic cost of COVID-19 is severe. It threatens to scale back years of progress on reducing poverty and inequality and to further weaken social cohesion and global cooperation. Job losses, a widening digital divide, disrupted social interactions, and abrupt shifts in markets could lead to dire consequences and lost opportunities for large parts of the global population. The ramifications—in the form of social unrest, political fragmentation and geopolitical tensions—will shape the effectiveness of our responses to the other key threats of the next decade: cyberattacks, weapons of mass destruction and, most notably, climate change.

In the Global Risks Report 2021, we share the results of the latest Global Risks Perception Survey (GRPS), followed by analysis of growing social, economic and industrial divisions, their interconnections, and their implications on our ability to resolve major global risks requiring societal cohesion and global cooperation. We conclude the report with proposals for enhancing resilience, drawing from the lessons of the pandemic as well as historical risk analysis. The key findings of the survey and the analysis are included below.

Global risks perceptions

Among the highest likelihood risks of the next ten years are extreme weather, climate action failure and human-led environmental damage; as well as digital power concentration, digital inequality and cybersecurity failure. Among the highest impact risks of the next decade, infectious diseases are in the top spot, followed by climate action failure and other environmental risks; as well as weapons of mass destruction, livelihood crises, debt crises and IT infrastructure breakdown.

When it comes to the time-horizon within which these risks will become a critical threat to the world, the most imminent threats – those that are most likely in the next two years – include employment and livelihood crises, widespread youth disillusionment, digital inequality, economic stagnation, human-made environmental damage, erosion of societal cohesion, and terrorist attacks.

Economic risks feature prominently in the 3-5 year timeframe, including asset bubbles, price instability, commodity shocks and debt crises; followed by geopolitical risks, including interstate relations and conflict, and resource geopolitization. In the 5-10 year horizon, environmental risks such as biodiversity loss, natural resource crises and climate action failure dominate; alongside weapons of mass destruction, adverse effects of technology and collapse of states or multilateral institutions.

Economic fragility and societal divisions are set to increase

Underlying disparities in healthcare, education, financial stability and technology have led the crisis to disproportionately impact certain groups and countries. Not only has COVID-19 caused more than two million deaths at the time of writing, but the economic and long-term health impacts will continue to have devastating consequences. The pandemic’s economic shockwave—working hours equivalent to 495 million jobs were lost in the second quarter of 2020 alone—will immediately increase inequality, but so can an uneven recovery. Only 28 economies are expected to have grown in 2020. Nearly 60% of respondents to the GRPS identified “infectious diseases” and “livelihood crises” as the top short-term threats to the world. Loss of lives and livelihoods will increase the risk of “social cohesion erosion”, also a critical short-term threat identified in the GRPS.

#### Applying an American legal concept to other countries doesn’t work – interpretive differences, local institutions, and cultural distinctions make the plan meaningless abroad

Cheng 12 [Thomas, assistant professor at the Faculty of Law of the University of Hong Kong. "Convergence and Its Discontents: A Reconsideration of the Merits of Convergence of Global Competition Law." https://chicagounbound.uchicago.edu/cgi/viewcontent.cgi?article=1362&context=cjil]

The characteristics of developing countries require adjustments to specific competition law doctrines and principles. While it may be argued that these characteristics can be adequately taken into account by shifting enforcement priorities, only doctrinal changes can adequately reflect these characteristics. Take the patent-competition interface as an example. The lack of innovative capacity in a developing country means that patent competition law rules need to pay much less attention to innovation incentives, and there are much weaker reasons to incur short-term consumer welfare loss to generate these incentives. More concretely, this may mean that unilateral refusal to license is more susceptible to challenges in developing countries than in developed nations. This may be especially so if the product at issue is a basic necessity, the access to which significantly contributes to poverty alleviation and improved well-being of the poor. A more interventionist approach to unilateral refusal to license intellectual property would not be possible with a mere adjustment in enforcement priorities. It would require a doctrinal shift that may preclude substantive convergence on this prominent issue in competition law.

## Starlink Advantage CP

#### Counterplan:

#### The appropriation of outer space by Starlink, OneWeb, and Telesat via Large Satellite Constellations in Lower Earth Orbit is unjust.

#### The integration of blockchain security technology by private entities into Large Satellite Constellations in Lower Earth Orbit is just.

#### The use of Antisatellite Weapons by states is unjust .

#### Plank 1 solves almost all of advantage 1 – the cards are overwhelmingly about Starlink

#### Plank 2 solves any residual offense – blockchain makes hacking computationally impossible

Adams ’19 (Dr. Victoria Adams has over 30 years of experience in the technology and consulting industry. She currently leads ConsenSys’s US Public Sector Practice. Prior to joining ConsenSys, she has worked for many of the Big Four consulting firms and has led her own startups. She is deeply involved in fighting the Opioid Epidemic as an activist and in a professional capacity. She has worked with harm reduction groups and spoken extensively on the topic to medical professionals, technologists, and senior policymakers. She has written numerous articles and books on the subject of technology and the public sector. She has a PhD in economics and public policy and a Masters in public administration. Mar 5, 2019 “Why Military Blockchain is Critical in the Age of Cyber Warfare” <https://media.consensys.net/why-military-blockchain-is-critical-in-the-age-of-cyber-warfare-93bea0be7619> | SP)

Blockchain is an incorruptible, decentralized, digital ledger of transactions that can be programmed to record not only exchange of information. Critically, for information to be exchange between any two nodes within in a blockchain system, all nodes (or most nodes, depending on the structure) must agree that the exchange of information is legitimate. They do this through a variety of methods; either acting as a recognized trusted party or my solving complex cryptographic problems. Once the exchange is accepted, that exchange is written into a shared copy of a digital ledger that contacts all records of transactions that is effectively unchangeable.

Thus, a clear, accountable record of all transactions is available to approved parties within the network. Any attempt to hack the ledger or send an illegitimate order would require attacking all nodes simultaneously. The computing power to achieve this level of penetration is currently beyond even state actors. Moreover, smart contracts or decision rules can be encoded into a blockchain that can automate key functions and trigger intelligent subroutines.

#### Plank 3 solves the second advantage – their only internal link is state based ASAT attacks. We stop them!

## ILAW

#### CP: States ought to individually expand the Public Trust Doctrine to reduce private actor appropriation of Outer Space

#### Solves the aff–normal means is COPUOS–a multilateral committee

**Halstead 10**—(B.S., Psychology, The University of Alabama; J.D., The University of Alabama School of Law; LL.M., Institute of Air and Space Law, McGill University; Lieutenant Colonel, U.S. Air Force Judge Advocate General's Corps). C. Brandon Halstead. 2010. "Prometheus Unbound - Proposal for a New Legal Paradigm for Air Law and Space Law: Orbit Law," Journal of Space Law 36, no. 1, 143-206

The debate on how to distinguish airspace from outer space is as old as the space age itself. The problems emerging from space exploration first entered the agenda of the United Nations in 1957, and were later placed on the agenda before the General Assembly through the establishment of an Ad Hoc Committee on the Peaceful Uses of Outer Space (COPUOS) in 1958.' Although this Committee initially focused on the debate of disarmament, its status was later made permanent in 1961 while its charter was expanded to include examination of all issues relating to the field of exploration and use of outer space by governmental and non-governmental organizations.16 In 1962 the Scientific and Technical Sub-Committee and Legal Sub-Committee began their true substantive work and became the main center of international cooperation and coordination for exploration of peaceful uses of outer space." Successive sessions focused on general and specific issues of space law, including the establishment of a frontier between outer space and atmospheric space18.

#### Net benefit is PPWT–no negotiations means no strategic bargaining

## COUPUS

#### CP: The Committee on the Peaceful use of Outer Space ought to establish an application system of property rights on celestial bodies granted upon the conditions listed in Steffen

**Steffen 21** [Olaf Steffen, Olaf is a scientist at the Institute of Composite Structures and Adaptive Sytems at the German Aerospace Center. 12-2-2021, "Explore to Exploit: A Data-Centred Approach to Space Mining Regulation," Institute of Composite Structures and Adaptive Systems, German Aerospace Center, [https://www.sciencedirect.com/science/article/pii/S0265964621000515 accessed 12/12/21](https://www.sciencedirect.com/science/article/pii/S0265964621000515%20accessed%2012/12/21)] Adam

4. The data-centred approach to space mining regulation 4.1. Core description of the regulatory regime and mining rights acquisition process The data gathered in the exploration of a [celestial body](https://www.sciencedirect.com/topics/social-sciences/astronomical-systems) is not only of value for space mining companies for informing them whether, where and how to exploit resources from the body in question, but also for science. The irretrievability of information relating to the solar system contained in the body that will be lost during resource exploitation carries a value for humanity and future generations and can thus be assigned the characteristic of a common heritage for all mankind as invoked in the Moon Agreement. This characteristic makes exploration data an exceptional and unique candidate for use in a mechanism for acquiring mining rights because its preservation is of public interest and its disclosure in exchange for exclusive mining rights does not place any additional burden on the mining company. The following principles would form the cornerstones of the proposed regulatory regime and rights acquisition mechanism based on exploration data: Without preconditions, no entity has a right to mine the resources of a celestial body. An international regulatory body administers the existing rights of companies for mining a specific celestial body. Mining rights to such bodies can be applied for from this international regulatory body, with applications made public. The application expires after a pre-set period. Mining rights are granted on the provision and disclosure of exploration data on the celestial body within the pre-set period, proposedly gathered in situ, characterising this body and its resources in a pre-defined manner. The explorer's mining right to the resources of the celestial body is published by the regulatory body in a mining rights grant. The data concerning the celestial body are made public as part of the rights grant within the domain of all participating members of the regulatory regime. The exclusive mining rights to any specific body are tradeable. The scope of the regulatory body with respect to the granting of mining rights is not revenue-oriented. The international regulatory body would thus act as a curator of a rights register and an attached database of exploration data. The concept is superficially comparable to patent law, where exclusive rights are granted following the disclosure of an invention to incentivise the efforts made in the development process. In the following section, the characteristics of such a regulatory regime are further discussed with respect to the formation of [monopolies](https://www.sciencedirect.com/topics/social-sciences/monopolies), market dynamics, conflict avoidance, inclusivity towards less developed countries and the viability of implementation. 4.2. Discussion and means of implementation The proposed regulatory mechanism has advantages both from a business/investor and society perspective. First, it prevents already highly capitalised companies from acquiring exploitation rights in bulk to deny competitors those objects that are easiest to exploit or most valuable, which would otherwise be possible in any kind of pay-for-right mechanism and could result in preventing market access to smaller, emerging companies. Thus, early monopoly formation can be avoided. The use of data disclosure for the granting of mining rights ensures the scientific community has access to this invaluable source of information. In this way, space mining prospecting missions can lead to a boost in research on small celestial bodies at a speed unmatchable by pure government/agency funded science probes. This usefulness to the scientific community could lead to sustained partnerships between prospecting companies and scientific institutions and could even provide a source of funding for the companies through R&D grants and public-private partnerships. The results of the exploration efforts contribute to research on the formation of planets and the history of the solar system and provide valuable insight for space defence against asteroids. The transition of exploration from a tailored mission profile with a purpose-built spacecraft to a standard task in space flight would also lead to a cost reduction of the respective exploration spacecraft through [economies of scale](https://www.sciencedirect.com/topics/social-sciences/economies-of-scale). This describes the very benefits Elvis [[24](https://www.sciencedirect.com/science/article/pii/S0265964621000515#bib24)] and Crawford [[25](https://www.sciencedirect.com/science/article/pii/S0265964621000515#bib25)] imagined as possible effects of a space economy. Thus, there is an immediate return for society from the exploitation rights grant. It also reconciles the adverse interests of space development and [space science](https://www.sciencedirect.com/topics/social-sciences/space-sciences) as laid out by Schwartz [[26](https://www.sciencedirect.com/science/article/pii/S0265964621000515#bib26)]. It ensures that, by exploitation, information contained in celestial bodies is not lost for future generations.The application period should not be set in a manner that creates a situation that can be abused through the potential for stockpiling inventory rights. Rather, it is intended to prevent conflict in the phase before exploration data gathered by a mission, as a prerequisite to the mining rights grant, is available. In other words, only one exploration effort at a time can be permitted for a specific body. The time frame between the application and the granting of mining rights (meaning: availability of the required exploration data set) should be tight and should only consider necessary exploration time on site, transit time and possibly a reasonable launch preparation and data processing markup. These contributors to the application period make it clear that the time frame could be dynamic and individualistic, depending on the exploration target (transit time and duration of exploration) and the technology of the exploration probe (transit time). After the expiration of the application period, applications for the exploration target would again be permissible. To prevent the previously mentioned stockpiling of inventory rights, credible proof of an imminent exploration intention would need to be part of the application process, for example, a fixed launch contract or the advanced build status of the exploration probe. Such a mechanism would not contradict the statement in the OST that outer space shall be free for both exploration and scientific investigation. Applications would not apply to purely scientific exploration. An application would only be necessary as a prerequisite for mining. Even resource prospecting could take place without an application (for whatever reason), with a subsequent application comprising in situ data already gathered. For such cases, the application process would need to provide a short period for objections to enable the secretive explorer to make their efforts public. The publication of the application for the mining rights, which is nothing more than a statement of intention to explore, thus provides a strong measure for avoiding conflict. The transparency of where exploration spacecraft are located and, at a later stage, where mining activities take place, provides additional benefits for the sustainable use of space, trust building and deterrence against malign misuse of mining technology. Involuntary spacecraft collisions of competitors in deep space are prevented by the reduction of exploration efforts at the same destination through the application for mining rights by one applicant at a time. As pointed out by Newman and Williamson [[20](https://www.sciencedirect.com/science/article/pii/S0265964621000515#bib20)], this is relevant because space debris does not de-orbit in deep space as in the case of LEO. Deep space may be vast, but the velocities involved mean that small debris particles are no less dangerous. Considering NEO mining with fleets of small spacecraft, malfunctions and/or destructive events could create debris clouds crossing Earth's orbit around the sun on a regular basis, presenting another danger to satellites in Earth's own orbit. Thus, by effectively preventing the collision of two spacecraft, one source of debris creation can be mitigated through this regulation mechanism. With respect to Deudney's [[11](https://www.sciencedirect.com/science/article/pii/S0265964621000515#bib11)] scepticism of asteroid mining and the dual-use character of technology to manipulate orbits of celestial bodies, it has to be stated that this potential is truly inherent to asteroid mining. An asteroid redirect mission for scientific purposes was pursued by NASA [[49](https://www.sciencedirect.com/science/article/pii/S0265964621000515#bib49)] before reorientation towards a manned lunar mission. In one way or another, each type of asteroid mining will require the delivery of the targeted resource to a destination via a comparable technology as formerly envisioned by NASA, be it as a raw material or a useable resource processed in situ, even if this is not necessarily done through redirecting the whole asteroid and placing it in a lunar orbit. However, to be misused as a weapon, space mined resources would have to surpass a certain mass threshold to survive atmospheric entry at the target. This seems unfeasible for currently discussed mining concepts using small-scale spacecraft as described in this article. Redirecting larger masses or whole asteroids would require far more powerful mining vessels or small amounts of thrust over long periods of time. The continuous, (for a mining activity) untypical change in the orbit of an asteroid would make a redirect attempt with hostile intent easily identifiable, effectively deterring such an activity in the first place by ensuring the identification of the aggressor long before the projectile hits its target. The proposed database would provide a catalogue of asteroids with exploration and mining activities in place that should be tracked more closely because of their interaction with spacecraft. This would, in fact, be necessary per se as a precaution to avoid catastrophic mishaps, such as the accidental change of a NEO's orbit to intercept Earth by changing its mass through mining.

## Geo-Satelites PIC

#### CP: The appropriation of outer space is unjust except in the instance of geostationary satellites

#### It’s appropriation

**Thornburg 18** [Matthew Thornburg, Associate Professor of History, Political Science, and Philosophy at the University of South Carolina Aiken with a PhD in Political Science from GMU, 2018, “Are the Non-appropriation Principle and the Current Regulatory Regime Governing Geostationary Orbit Equitable for All of Earth’s States?,” Michigan Journal of International Law, http://www.mjilonline.org/are-the-non-appropriation-principle-and-the-current-regulatory-regime-governing-geostationary-orbit-equitable-for-all-of-earths-states/]/Kankee

As the law currently stands, geostationary orbit – a constant orbital position above Earth’s equator – is governed by the OST and is therefore subject to the treaty’s attendant ban on national appropriation. Spaces, or slots, in geostationary orbit[2] are desired because they are exceedingly convenient for communicating with earth. They are highly limited and as a consequence, highly valuable. Moreover, these spaces are allotted on a first-come-first-served basis[3] making them virtually unattainable by less scientifically and economically advanced states[4], or those that are just plain late to the game. The ban on national appropriation is enumerated in the Second Article of the OST, which states: “Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by other means.”[5] The geostationary orbital position is generally agreed upon by experts[6] as part of “outer space” and consequently, forbidden from appropriation. The OST is clear in prohibiting claims of sovereignty, but the subsequent clauses leave much to interpretation when considering what other acts constitute “national appropriation.” In other words, the question surrounding geostationary orbital slots is “whether the continued exclusive occupation by a geostationary satellite of the same physical area is a violation of the ban on national appropriation”[7] by use, occupation, or other means. In his article, Major Legal Issues Arising from the Use of the Geostationary Orbit, Stephen Gorove says that, “it is not clear that a satellite in geostationary orbit would be able to maintain its exact position and occupy the same area over a period of time…” so as to “appropriate” and thus violate Article II of the OST. The analysis should not turn on whether the satellites in geostationary orbit maintain their exact position. Instead, it is the continual use of the orbital slot that should be examined in light of the OST prohibition. The average lifespan of a geostationary satellite is 15-20 years,[8] effectively shutting out any other state’s use of that slot for at least that long. A time frame of this nature seems to be the exact type of “use or occupation” the treaty seeks to foreclose because of the consequent unequal access to the use of space, and the consequent potential to cement the economic interests of certain nations and firms. Compounding this concern is the fact that operators of the geostationary satellites need only refile with the International Telecommunications Union (“ITU”) to “renew” a slot and replace old satellites with new ones.[9] Essentially, such operators keep the orbital slot indefinitely. In light of the OST – a treaty dominated by goals of fair and equitable use and access to space – endless use of these valuable slots should rise to the level of national appropriation by means of use, occupation, or other means.

#### Satellites are key to ethics–it’s key to ethical responsibility and accountability under any framework. Not consequentialist but about the intrinsic use of these satellites

Steven **Livingston**, 6-23-**2016**, "Satellite imagery augments power and responsibility of human rights groups," Brookings, <https://www.brookings.edu/blog/techtank/2016/06/23/satellite-imagery-augments-power-and-responsibility-of-human-rights-groups/> //SR

In recent years, commercial remote sensing satellites have played a key role in dozens of human rights and war crimes investigations. They’ve been used to spot mass graves in Burundi, verify the destruction of two towns in northern Nigeria by Boko Haram, and reveal the massacre of at least 350 people by the Nigerian army. When the Kremlin denied involvement in the fighting in Ukraine in September 2014, satellite imagery and testimony gathered by Amnesty International (AI) indicated the Kremlin’s assertion was incorrect. And in April, Human Rights Watch (HRW) used satellites to document military and police abuses in Venezuela. In the last decade, AI and HRW, sometimes in partnership with the American Association for the Advancement of Science, have produced dozens of reports based on the analysis of commercial satellite imagery. One group, Satellite Sentinel Project (SSP), was built around the use of commercial remote sensing technology. What are the political and policy implications of the use of satellite technology by human rights organizations? First, they allow human rights NGOs to monitor places that are otherwise too distant or too dangerous to reach by conventional means. Secondly, remote sensing introduces a timeline into investigations. Because of the enormous stores of geospatial data found in archives, analysts can essentially look back in time in search of evidence. DigitalGlobe’s WorldView-3 satellite collects 1,200,000 km2 of images of the earth each day, and it is only one of the dozens of high-resolution satellites in orbit, with more coming online each year. As new satellites shrink the time between overflights, the ability to observe events is growing. Third, human rights NGOs are now in the business of anticipating events. With enough imagery over time, patterns emerge that allow for prediction. This offers the tantalizing possibility of NGO interventions in events by releasing statements and images as a warning to potential aggressors that they are being observed. While all three outcomes are important, it is perhaps the third one that raises the greatest ethical and policy challenges. Though often debated and renegotiated, a key component of AI’s mission since its founding in 1961 is to bear witness. Professor Stephen Hopgood notes that bearing witness involves an adherence to rules and procedures that seek to “construct in practical terms the kind of space – above, beyond, outside the world – in which the idea of objective morality, of a kind of universal truth, could be anchored”. It involves taking a principled but detached position. The availability of god-like views from the heavens certainly allows AI to stand aloof – literally, “above, beyond, outside the world.” Yet with satellites, AI and other groups that make use of them now have a potent form of agency to intervene indirectly in events. As the adage says, knowledge is power. As an AI analysts told me recently, “The real purpose (of the 2007 Eyes on Darfur project) was a deterrent effect.” Eyes on Darfur was one of AI’s first major remote sensing projects. Some might argue that AI has taken a step beyond bearing witness: it is using its moral authority and its technical prowess to alter events on the ground. A counter to this assertion would point out that human rights organizations have always used the tools available to them to alter the behavior of war criminals and human rights abusers. The “boomerang model” of human rights advocacy, developed by political scientists Margaret Keck and Kathryn Sikkink, underscores the idea that information collected by human rights NGOs is intended to pressure abusers of rights into better compliance with broadly shared norms. In this respect, there is a direct line from writing an open letter to publishing a satellite image. Yet with satellites the burdens are greater. Getting it wrong, interpreting an image incorrectly or releasing information that undermines the wellbeing of populations constitutes an entirely different set of moral and ethical considerations. The use of satellite imagery brings human rights NGOs closer to sharing responsibility for rapidly unfolding events with the players themselves. With greater agency comes greater moral responsibility.

#### Solves the aff–geoSATs are legal

Louis De Gouyon **Matignon, 2019**, "Orbital slots and space congestion," Space Legal Issues, <https://www.spacelegalissues.com/orbital-slots-and-space-congestion/> //SR

Near-Earth space is formed of different orbital layers. Terrestrial orbits are limited common resources and inherently repugnant to any appropriation: they are not property in the sense of law. Orbits and frequencies are res communis (a Latin term derived from Roman law that preceded today’s concepts of the commons and common heritage of mankind; it has relevance in international law and common law). It’s the first-come, first-served principle that applies to orbital positioning, which without any formal acquisition of sovereignty, records a promptness behaviour to which it grants an exclusive grabbing effect of the space concerned. Geostationary orbit is a limited but permanent resource: this de facto appropriation by the first-comers – the developed countries – of the orbit and the frequencies is protected by Space Law and the International Telecommunications Law. The challenge by developing countries of grabbing these resources is therefore unjustified on the basis of existing law. Denying new entrants geostationary-access or making access more difficult does not constitute appropriation; it simply results from the traditional system of distribution of access rights. The practice of developed States is based on free access and priority given to the first satellites placed in geostationary orbit.

#### PICs negate–they prove a competing general principle and are good to test specific parts of the aff in depth–they chose their advocacy so they should defend all of it– most logical and outweighs cuz it’s a side constraint to all arguments

## VIASAT Pic

#### Counterplan: The appropriation of outer space by private entities except for Viasat is unjust

#### Viasat boosts Indigenous economies.

**SBS 1/12** [Indigenous Australians to lead space industry at new Alice Springs earth ground station, <https://www.sbs.com.au/news/indigenous-australians-to-lead-space-industry-at-new-alice-springs-earth-ground-station/b35811cc-1ecb-4a90-9be2-d6c1f4486e3b>, Jan 12 2022, SBS News] [SS]

A multi-million-dollar earth ground station will be built in the Northern Territory's Alice Springs, set to be the first development of its kind on Aboriginal-owned land in Australia. Indigenous Australians will become leading participants in the global satellite and space industry, with the Real-Time Earth (RTE) facility expected to bring new jobs and economic opportunities to remote Australia. Global communications company Viasat Inc. has partnered with Aboriginal not-for-profit science and technology company Centre for Appropriate Technology Ltd (CfAT) to deliver the project, financed by Indigenous Business Australia. It will be used to track the next generation of low earth orbiting satellites for earth observation used for scientific research, environmental monitoring, and commercial applications. CfAT chairperson Peter Renehan said the facility "puts Aboriginal people at the forefront of Australia’s growing space sector". "This state-of-the-art development will provide a positive contribution to the local economy through employment opportunities for local businesses during each phase of construction as well as ongoing jobs for local Aboriginal people once operational," she said. "CfAT exists to provide people in regional and remote Australia with options for maintaining their relationship with country. "We do this by providing technologically innovative solutions to infrastructure challenges with digital connectivity as a core focus of the companies work." A KPMG report Aboriginal and Torres Strait Islander people own or have controlling interests in about 40 per cent of the Australian land mass under various forms of title and legislation. Indigenous Business Australia Chairperson Eddie Fry said the new earth ground station was important for both the Australian space industry and the Indigenous community. "Aboriginal and Torres Strait Islander people own or control significant areas of land in remote areas where there is limited economic potential," he said. "This first of its kind development on Aboriginal land gives the community both economic and social returns." He added Alice Springs was an optimal environment for this type of technology due to a large number of cloud-free days, limited radio interference and access to fibre network on the grounds. Indigenous Australians Minister Ken Wyatt said developments such as this showcased how Aboriginal and Torres Strait Islander people could continue leading roles in our nation’s innovation. "Indigenous Australians hold a powerful economic force through their connections with land, culture and community,” he said. "This exciting project is a prime example of the power of country to help deliver commercial returns through technology, employment and career opportunities."

#### Indigenous led economics solve warming.

**Swiderska ‘21** [Here's why Indigenous economics is the key to saving nature, <https://www.iied.org/heres-why-indigenous-economics-key-saving-nature>, Krystyna Swiderska, April 13 2021] [SS]

Western economics is not only destroying the environment. It is also destroying Indigenous peoples’ holistic development models that ensure balance with nature, and provide alternative paradigms for sustainable development. For many of the world’s 476 million Indigenous peoples, balance and reciprocity (PDF) with nature are fundamental principles that guide all aspects of life. Rather than privileging human economic goals and pursuing nature conservation separately, many Indigenous societies seek to achieve ‘holistic wellbeing’ or ‘Buen Vivir’, which means the wellbeing of both people and nature together. Take the Quechua and Aymara people in Peru, for example, who make up nearly a fifth of Peru’s population. According to their Andean cosmovision, the world is divided into three communities or ‘ayllus’: i) the wild or natural world, ii) the human and domesticated world, and iii) the sacred world. To achieve wellbeing (‘Sumaq Causay’), these three communities must be in balance, which requires reciprocity between them (‘ayni’). These Andean concepts come from the Incas, the largest pre-Columbian empire, and are still very much alive in the Andes. So too are barter markets (PDF), which provide people at different altitudes with access to essential nutrients and help sustain rich Andean biodiversity. Balance with nature, reciprocity and solidarity (the obligation to help those in need) are key principles embedded in many Indigenous cultures across the world, from the Americas, to China, India and Kenya. These Indigenous economies (PDF) promote sufficiency rather than infinite growth, and equity and redistribution of wealth rather than accumulation. Many subsistence economies are also characterised by circular agriculture models, which minimise waste and carbon emissions. The separation of people and nature threatens both In Peru and across the world, the nature- and people-friendly informal economies of Indigenous peoples are steadily being eroded by Western, neo-liberal economic policies that separate people and nature, and view Indigenous cultures and subsistence economies as ‘backward’ and in need of modernisation. Ironically, the same Indigenous economies that have conserved and enhanced biodiversity for millennia are now threatened by environmental policies that often fail to recognise the value of Indigenous knowledge, thus contributing to its erosion. Most of the world’s remaining biodiversity is located on lands owned or managed by Indigenous peoples. A global scientific assessment (PDF) by the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES) found that “nature is generally declining less rapidly in Indigenous peoples’ lands than in other lands”. However, the IPBES assessment also found nature managed by Indigenous peoples and local communities (IPLCs) is under increasing pressure, as is the knowledge of how to manage it. Areas managed by IPLCs “are facing growing resource extraction, commodity production, mining and transport and energy infrastructure”. Negative impacts from all these pressures include “continued loss of subsistence and traditional livelihoods” and impacts on “health and wellbeing from pollution and water insecurity”. These impacts “also challenge the transmission of Indigenous and local knowledge” and “the ability of indigenous peoples and local communities to conserve and sustainably manage wild and domesticated biodiversity that are also relevant to broader society”. Mainstream economic activities on Indigenous lands have rarely benefited Indigenous Peoples, who make up 6% of the world’s population but 19% of the extreme poor. In fact, their situation has often deteriorated (PDF), due to loss of land and natural resources, and the weakening of cultural ties and social cohesion. Integration with market economies has led to social tension and conflict, limited opportunities for meaningful employment, low returns for producers and a shift towards consumerist lifestyles. The dominant approach to nature conservation through protected areas also reflects a Western worldview that separates people and nature, often excluding Indigenous people to protect biodiversity. Many state-run protected areas have resulted in negative social impacts, are losing biodiversity and are not effectively or equitably managed, as IPBES found (PDF). Bridging the divide Clearly, alternative development and conservation models that bridge the nature-people divide are urgently needed to achieve the 2030 Sustainable Development Goals. Indigenous Peoples’ holistic worldviews provide alternative development paradigms, which benefit both people and nature. For example, Indigenous Peoples’ ‘mixed economies’, which combine subsistence and market activities, sustain Indigenous values that underpin biodiversity conservation, while contributing to nutrition, health, wellbeing and climate resilience, and generating income. Local markets and short value chains are often prioritised, rather than global export markets. Indigenous Peoples have started to shape new community enterprise models that assert control over their territories and promote Indigenous traditions of sustainability and enterprise for the common good. These Indigenous enterprises have delivered multiple benefits for livelihoods, culture, social capital and biodiversity conservation. For example, in the Potato Park in Peru, a Biocultural Heritage Territory governed by six Quechua communities, collective micro-enterprises (for gastronomy, agro-ecotourism, crafts, herbal teas and so on) are guided by Andean principles and holistic wellbeing goals. Ten per cent of the revenues from each micro-enterprise is invested in a communal fund and redistributed annually to reward biocultural heritage stewards and help those in need. Thanks to their ancestral Indigenous knowledge, linked with science, the Potato Park communities have ensured food security despite severe climate change impacts and the COVID-19 pandemic. During the pandemic, the communities donated a ton of potatoes to hungry people in Cusco, in line with the principle of solidarity. The social ties and mutual care and solidarity that Indigenous communities have displayed in the pandemic, highlights the type of social relations that are core to resilient economies and an inclusive green recovery. The concept of 'biocultural heritage', which is derived from Indigenous Peoples’ holistic worldviews and traditions, recognises the inextricable linkages between nature, culture and development. The way forward A new narrative is needed which recognises the highly progressive and dynamic nature of Indigenous knowledge and economic systems that put nature and equity at the heart of development. Indigenous Peoples have a leading role to play in shaping alternative paradigms to mainstream economic models that are destroying the environment and traditional cultures. Achieving the Sustainable Development Goals (SDGs), and undoing years of racial injustice that lie at the root of poverty and inequality, requires structural reform across economic and environment sectors, from local to global levels, to put Indigenous Peoples at the heart of decision-making. This year provides an opportunity for governments and political leaders to demonstrate real commitment to achieving the SDGs and leaving no one behind. It is not too late to reform the leadership structure for the UN Food Systems Summit in September 2021, so that representatives of poor, hungry, marginalised and Indigenous Peoples play a leading role. Or to reform the proposed post-2020 Global Biodiversity Framework (PDF), to be agreed at the biodiversity convention COP15 in October, so that the knowledge and leadership of Indigenous Peoples and local communities is integrated across the targets. Indigenous Peoples have answers for many of the world’s most intractable challenges: inequality, ecocide, climate change. We cannot address these challenges without their wisdom and leadership.

## Public Private

#### CP text: The United States federal government should:

#### A] Fund a public-private partnership for deep space exploration

#### B] Triple NASA’s budget and earmark increased funding for cooperative deep space exploration

Galeon 17 [(Dom, writer for Futurism), “SpaceX Asks the U.S. To Fund a Public-Private Partnership for Deep Space Exploration,” July 14, 2017, <https://futurism.com/spacex-asks-the-u-s-to-fund-a-public-private-partnership-for-deep-space-exploration>] TDI

SpaceX Asks the U.S. To Fund a Public-Private Partnership for Deep Space Exploration The best chance of success could come from pooling our resources. / Off World/ Deep Space Exploration/ NASA/ Public Private Partnerships SpaceX/Flickr Image by SpaceX/Flickr WORKING TOGETHER Some 10 years back now, the National Aeronautics and Space Administration (NASA) decided to work with private space companies to ferry people and cargo to the International Space Station (ISS). At the time, the space agency perhaps didn’t expect that it was heralding in a new era in space exploration. Both NASA and private agencies like SpaceX and Blue Origin have benefited from the collaboration. The former is able to save on costs, while the latter get to pursue their own individual programs, such as perfecting their reusable rocket technologies for commercial use. Without this partnership, these companies would not have been able to grow and develop at the same rate. Thus far, the joint missions have been limited to just orbital and near-orbit launches, like the Commercial Orbital Transportation Services (COTS) program, but SpaceX wants that to change. At a hearing of the U.S. Senate’s Subcommittee on Space, Science, and Competitiveness on Thursday, SpaceX’s senior vice president for global business and government affairs Tim Hughes asked the U.S. government to open up deep space exploration for similar public-private partnerships. “The principles applied in past programs for low Earth orbit capability can and should be applied to deep space exploration,” he said, referencing the COTS program. ADVERTISEMENT A DEEP SPACE FUTURE In order for the U.S. and for humankind to establish a more permanent presence in space, Hughes asserts that the government should fund a COTS-like program for deep space. It won’t really be a matter of funding the competition, he argued, because the program could run parallel to NASA’s existing deep space exploration plans, such as the Space Launch System (SLS) and the Orion spacecraft. Living Off The Land: A Guide To Settling Mars [Infographic] Click to View Full Infographic “I think [these] can be readily supplemented with public-private partnerships to allow us to sustain a permanent presence in space,” said Hughes. NASA could impose “high level requirements” for this deep space partnership, just like it does with COTS, Hughes added. The partnership could prove particularly beneficial for NASA right now given the recent reports saying it doesn’t have the funding needed for its Mars mission. Of course, as with any change, push back is to be expected. For one, more established aerospace firms that already work with NASA — Lockheed Martin and Boeing, among others — might not be in favor of this idea. The important thing, however, is to realize that deep space exploration is an entirely different ballgame than missions in near-Earth orbit, and the best chance of success may come from pooling our resources.

#### The CP turns the aff and prevents stifling of innovation – k2 climate tech.

Van Burken 20 [(Rebecca, technology policy analyst at Reason Foundation) “Biden Can Utilize Space Companies and Public-Private Partnerships,” December 14, 2020 https://reason.org/commentary/biden-can-utilize-space-companies-and-public-private-partnerships/] TDI

Biden Can Utilize Space Companies and Public-Private Partnerships The commercial space industry is making NASA's operations more cost-effective and encouraging innovation. By Rebecca van Burken December 14, 2020 President-elect Joe Biden will predictably distance himself from many of the Trump administration’s policies and positions, but its openness to commercial space partnerships should not be among them. The expansion of public-private space partnerships that began during the Obama administration has continued during the Trump administration. These public-private partnerships have helped lead to many major space successes, including crewed-launches returning to American soil through SpaceX and the first-ever civilian passenger on a private suborbital spaceflight as part of Virgin Galactic’s 2019 VSS Unity SpaceShipTwo launch. These successes, and others, reflect positively on the U.S. space sector. However, they would not have happened without the entrepreneurial nature of commercial space. Unlike government engineers and scientists, commercial space operations are not constrained by government bureaucracy nor reliant on taxpayer funding. This allows commercial space companies to explore some seemingly far-fetched ideas, like 3D printing of small rockets, a concept being pioneered by the small start-up Relativity. Commercial space companies must also develop and maintain a competitive edge to survive in the market. Significant competition ultimately creates less-costly services that give NASA more bang for its buck when developing new technology. Competitive market pressures have created inspiring innovation exemplified by SpaceX’s reusable rocket technology and proposals for recycling and turning discarded orbiting tanks into space stations. Without the federal government’s continued openness to commercial space, innovation, and invention in the U.S. space industry could be stifled. Commercial space continues to show up when the government needs new services. Over the last few years, we have seen amazing new technologies developed to track environmental and climate concerns. This is, in part, because NASA has entered into deals with private companies like Planet that are able to analyze data collected by satellite imagery. Planet has stakes in defense satellite imagery but has expanded its portfolio to collect data for climate scientists and researchers to use. Its constellation of 120 satellites is at work photographing every portion of the world at least once a day, which provides constant and up-to-date environmental information. By maintaining deals like that with commercial satellite companies, NASA can avoid the costs of creating its own satellite constellation and other remote sensing technology. Additionally, NASA does not need to focus its energies on updating technologies to keep up with new software and technological capabilities. Companies that worry about competition in the market naturally reassess their services and the burden of doing this should be put on private industry, not on the government. Biden’s team should seek out the most effective private partners, hiring new talent in civil programs to use these systems. This would also free up funding for crewed space exploration. In addition to looking to develop new partnerships for space-related efforts, a Biden administration should reassess the government’s old partnerships. Prior to the election, Reuters reported that some Biden associates believe he may try to continue funding the International Space Station (ISS) beyond its planned termination in 2025. Reuters reported: …Biden, on the other hand, would likely call for a delayed moonshot and propose a funding extension for the International Space Station if he wins the White House, according to people familiar with the fledging Biden space agenda.Pushing back the moon mission could cast more doubt on the long-term fate of Boeing Co’s Space Launch System (SLS) rocket, just as Elon Musk’s SpaceX and Jeff Bezos’ Blue Origin scramble to bring rival rockets to market as soon as next year. Extending support for the space station for a decade would also be a major boost for Boeing, whose $225 million annual ISS operations contract is set to expire in 2024 and is at the depths of a financial crisis caused by the COVID-19 pandemic and the 737 MAX grounding after fatal crashes. This directly contradicts the Trump administration’s efforts to cease funding for the archaic space station by 2025. If Biden were to continue funding this aging facility via NASA it would drain funds that could be used for more important space activities, including manned missions. Commercial companies are primed and ready to take over the space station’s functions, and NASA should allow them to do so. If Biden has taxpayers and NASA continue to fund the ISS, it would most likely continue to contract with a company that famous for draining government money—Boeing. The partnerships with Boeing are the types of space policies the incoming Biden administration should be reviewing. It should ask Congress for a Government Accountability Office audit of Boeing’s work on the Space Launch System (SLS). The contract is for the development of a rocket with heavy-lift capacities that is designed to bring humans and cargo to the moon and back. Unfortunately, it has had numerous delays and cost overruns and is still not ready for a test flight, as Bloomberg reported in August: Boeing Co.’s Space Launch System, the largest rocket in NASA’s history, will carry a price tag of at least $9.1 billion — or 30% more than the previous estimate for a key element in the agency’s plan to return to the moon. Additionally, the costs for new ground infrastructure at Florida’s Kennedy Space Center to support the deep-space exploration program has jumped to $2.4 billion, Kathy Lueders, NASA’s associate administrator for human spaceflight, said in a blog post Wednesday. That’s also a 30% increase, the National Aeronautics and Space Administration said in an email Thursday. While we wait for Boeing to reuse obsolete space shuttle hardware on SLS, companies like Blue Origin and SpaceX are continually reusing entire launch boosters. Biden’s administration needs a real review of whether it would be more cost and time effective to work with companies like SpaceX or Blue Origin. SLS is estimated to cost NASA $1 billion or more for each launch, after having already consumed $18.3 billion since 2010. By contrast, SpaceX has had its self-funded heavy-lift rocket Starship in development since 2012 and has been doing successful prototype tests since 2019. Another space entity that will be a key issue for the Biden administration is the military agency, U.S. Space Force, created by President Trump. Reason magazine had detailed the numerous reasons a Space Force should not have been created. Now that it does exist, the Space Force should be viewed as an agency that does not need to spend taxpayers’ money to create its own technology for its missions. Instead, it should use the readily available market of commercial partners ready to contract services. Space News recently reported that Space Force is just now learning of the private sector’s capabilities: [Gen. John “Jay”] Raymond said in years past the only commercially viable services have been space launch and communications provided by geosynchronous satellites. But the Space Force is now becoming aware of other capabilities that are being offered commercially such as space tracking data, weather data and on-orbit satellite servicing. Raymond, chief of operations for Space Force, has previously committed to working closely with commercial satellite companies for space-related missions. Col. Michael “Hopper” Hopkins, commander of NASA’s SpaceX Crew-1 mission, was commissioned into the Space Force and began a new line of Space Force officers expected to launch to the ISS. To facilitate continued partnerships between Space Force and private enterprise, the Biden administration could back an initiative currently proposed to Congress that Space Force acquisitions be “speedy and agile.” Flexibility for Space Force would include pushing acquisition power to the lowest level of management and removing bureaucracy to make its programs more efficient. We are at a pivotal moment in the space industry’s history. The federal government has the opportunity to partner with space industry innovators like Elon Musk, Jeff Bezos, and Richard Branson, and ensure there’s the opportunity for new space startups to emerge and add value to the market. The other path, a government and NASA-centric approach to space, would likely stifle technological developments and breakthroughs by private companies, cost taxpayers a lot more money, and cause the United States to fall behind other nations in a number of key areas.

# Disads

## US PTX

#### Appropriations pass now but floor time and bipartisanship are key

Bolton 1/13 [Alexander, staff reporter for The Hill, “Negotiators report progress toward 2022 spending deal” https://thehill.com/policy/finance/589599-negotiators-report-progress-on-reaching-2022-spending-deal]

Senate and House negotiators say they are getting closer to a deal on setting the top-line spending number for an appropriations package to fund government past Feb. 18 and avoid a shutdown.

The top Democrats and Republicans on the Senate and House Appropriations Committees met Thursday morning to chart a path for reaching agreement on a fiscal year 2022 omnibus government funding bill and said they would meet again soon.

Negotiators in the so-called “Four Corners” say they’re optimistic about reaching an agreement.

“I think of we have a good chance coming together on this,” Rep. Kay Granger (Texas), the top-ranking Republican on the House Appropriations Committee, told reporters as she headed into the meeting.

One Democratic senator said he had been told that Senate Appropriations Committee Chairman Pat Leahy (D-Vt.) and Sen. Richard Shelby (Ala.), the top-ranking Republican on the Senate panel, already have a tentative deal on the parameters of the legislation and now need to bring their House counterparts on board.

Leahy told The Hill before the meeting that “we’re trying to” get an agreement between Senate and House negotiators wrapped up soon.

“We realize time is running out,” he said.

Leahy, however, declined to comment on any understandings he has with Shelby or on the negotiating dynamics between the Senate and House.

Shelby told reporters after the meeting that Congress’s top-four appropriators had laid out the path for the talks, something they hadn’t done before.

“The four of us had constructive talks of where we go and how we get there and how we start,” he said. “We hadn’t worked that out yet.”

“We’ll continue to talk and meet,” he said, adding that Leahy and House Appropriations Committee Chairwoman Rosa DeLauro (D-Conn.) will reconvene the group soon to resume negotiations.

Shelby warned that another stopgap funding measures is “looming” if they fail to hammer out a deal by early next month.

Leahy described the meeting as a “worthwhile discussion” and said he hoped to get a deal done in the next few weeks.

Leahy and Shelby met with Senate Majority Leader Charles Schumer (D-N.Y.) and Minority Leader Mitch McConnell (R-Ky.) Wednesday to discuss the parameters of the spending package, which is weeks behind schedule.

The 2021 fiscal year ended at the end of September and lawmakers uncharacteristically left Washington for Christmas without passing the annual appropriations bills because Democrats were focused on finishing work on President Biden’s sweeping climate and social spending bill, Build Back Better, which remains stalled in the Senate.

The Senate is scheduled to be in recess next week in observance of Martin Luther King Jr. Day but DeLauro said the group would meet again soon in order to have a better chance of reaching a deal by Feb. 18.

“That’s my goal,” she said. “We’re going to continue speaking.”

Asked if she feels more hopeful after the meeting, she said “I’m hopeful always.”

#### Large President-led national space policies incite immense partisan backlash that spills over to kill the entire political agenda

Dreier 16 [Casey Dreier, Chief Advocate & Senior Space Policy Adviser for The Planetary Society, April 13, 2016. “Does Presidential Intervention Undermine Consensus for NASA?” https://www.planetary.org/blogs/casey-dreier/2016/0413-does-a-strong-president-help-or-hurt-consensus-on-NASA.html]

To see how this happens, I recommend reading the book “[Beyond Ideology](http://smile.amazon.com/Beyond-Ideology-Politics-Principles-Partisanship/dp/0226470768/ref=smi_www_rco2_go_smi_g2243582042?_encoding=UTF8&*Version*=1&*entries*=0&ie=UTF8)” by Frances Lee. The author’s larger premise is that issues having no intrinsic relation to stated party ideology have become increasingly polarized in recent years. This is a function of the two party nature of our political system. If your party coalition wins, the other one loses. It’s [It is] zero-sum. Your party can win in one of two ways: you can make a better pitch to voters by demonstrating the superiority of your agenda; or you can undermine and stymie the agenda of the opposition party, making them unpopular with voters, and pick up the seats that they lose. Since you’re the only other political party, you gain in either scenario. I’m not sure if you’ve noticed, but the “undermine and stymie” approach has been popular for quite some time now in the U.S. Congress. Given this situation, the President and their policies naturally become the symbolic target of the opposition party. Anything promoted by the President effectively induces opposition by association. Lee demonstrates the magnitude of this induced polarization on various types of issues. For highly polarized issues like the role of government in the economy, or social issues, the impact is minimal—the opposition has already been clearly defined and generally falls into clearly defined ideologies of the Republican and Democratic parties. But for issues that do not fit readily into a predefined political ideology—like space—the induced polarization by the President can be significant. In fact, Lee showed that space, science, and technology issues incur the greatest increase in partisanship based on their inclusion in the Presidential agenda. One need only look to at the responses by political operatives of the opposing party to the strong human spaceflight proposals by [Barack Obama in 2010](http://www.shelby.senate.gov/public/index.cfm/mobile/newsreleases?ID=25F3AD2E-802A-23AD-4960-F512B9E205D2), [George W. Bush in 2004](http://www.nbcnews.com/id/3950099/ns/technology_and_science-space/t/bush-sets-new-course-moon-beyond/#.Vw3UMRMrKHo), and [George H.W. Bush in 1989](http://www.nytimes.com/1989/07/21/us/president-calls-for-mars-mission-and-a-moon-base.html) to see this reflected in recent history. This isn’t to say that Presidents can’t have a significant impact on the space program. Clearly they can. But the broad consensus needed for stability after their departure from office may be undermined by the very priority they gave it during their tenure. It what amounts to a mixed blessing for NASA, the U.S. space program does have an unusually strong bipartis

an group of politicians who support the program due to NASA centers in a variety of states throughout the union. Berger notes this throughout his article, and it does, in a way, act as force that is resistant to change for good and bad. This mitigates somewhat the pure polarization seen on other science and technology issues. But for a Journey to Mars—a major effort that would, at best, require stability and significant funding over many Presidential administrations—that may not be enough. Perhaps the solution is for the next President to maintain a light touch on space. Maybe they should speak softly through the budget process, and avoid the Kennedyesque speeches and declarations to Congress that induce the types of partisanship we so dearly need to avoid.

#### Congress will backlash to unpopular decisions

Dr. Alicia Uribe 13, Lecturer in Political Science at University of Illinois, PhD University of Washington St. Louis, “The Influence of Congressional Preferences on Legislative Overrides of Supreme Court Decisions”, Law & Society Review, <http://faculty.ucmerced.edu/thansford/Articles/congress_reaction_to_court.pdf>

Conclusion Congress and the Supreme Court interact in a separation-of-powers framework as each attempts to shape policy. While the broader congressional politics literature provides convincing empirical evidence that legislative preferences have a significant effect on Members’ votes and the passage of legislation (e.g., Poole and Rosenthal 2007), no systematic evidence demonstrates legislative overrides of Supreme Court opinions result from congressional preferences. This lack of empirical support exists despite the widespread application of a spatial modeling approach to understand Congress-Court relations, which assumes overrides occur when Court decisions are ideologically distant from Congress. Our first goal was to show, consistent with existing spatial models in the literature, that Congress is more likely to pass laws overriding Supreme Court decisions the further ideologically removed a decision is from the legislative gridlock interval. Our statistical results, for the first time, demonstrate Congress overrides Court decisions the further ideologically removed it is from them. A two standard deviation shift around the mean of the ideological distance of Congress from a Court decision increases the likelihood of an override by 66.4%. This result indicates Congress takes notice of the policy import of a Court decision and is more likely to reject those it dislikes on ideological grounds. We therefore provide evidence in support of a core part of SOP models, showing Congress does indeed respond to Court decisions based on its preferences. This result is important because it confirms a fundamental component of nearly all SOP explanations of the relationship between Congress and the Court. Future studies can now be confident that their assertion that legislative preferences influence overrides is on a strong empirical footing. We further demonstrate Congress does not act strategically by avoiding legislative overrides when the Court is likely to reject them. The implication is that Congress is motivated by position-taking goals rather than the ultimate effect of its policy actions and the separation-ofpowers. That is, our data suggest Congress cares more about the short-term gains from overriding legislation (e.g., passing the legislation for electoral purposes) than the ultimate shape of the policies it chooses to override. This result suggests the Court may, at least when it concerns the ultimate effect of override legislation, have greater influence on the ultimate location of public policy. Of course, this conclusion is tempered by the fact that Congress and the Court rarely disagree about whether the status quo should be altered; Congress wishes to override a Court decision preferred by the Court only 2.5% of the time in our data. As Dahl (1957) famously declared, the Court is not often out-of-step with the elected branches, and as a result Congress and the Court tend to agree on the desirability of previously decided Court cases. Finally, we show the effect of ideological distance matters for all types of Court decisions, including constitutional ones. Thus, while the Court may, as some suggest (e.g., King 2007), attempt to insulate its decisions from congressional override by using constitutional interpretation, it appears this tactic does not work. When Congress is ideologically distant from a Court decision, regardless of whether the decision is based on constitutional, statutory or common law interpretation, it is more likely to override it. This result is new to the literature, and it means subsequent studies cannot exclusively focus on statutory cases.

#### Yearlong CR ruins UAVs for decades—that undermines strategic competition

Wynne 1/14 [Brian Wynne, Federal Aviation Administration’s Drone Advisory Committee and Management Advisory Council, "A yearlong continuing resolution will hinder unmanned systems integration", 1/14/22, https://www.defensenews.com/opinion/commentary/2022/01/14/a-yearlong-continuing-resolution-will-hinder-unmanned-systems-integration/]

With fiscal 2022 well underway and the current continuing resolution set to expire without congressional consensus on a way forward on appropriations, the U.S. Department of Defense is preparing for the possibility of operations under a full-year CR stopgap measure. Let’s be clear: That will hinder the continued integration of unmanned systems into the U.S. military and ultimately harm our preparedness for strategic competition.

During a hearing this week of the House Appropriations Committee’s Defense Subcommittee, appropriators rightly acknowledged that a full-year CR would make our military less agile and curtail our ability to prepare for current security challenges. Members of Congress must also realize that failure to pass funding bills will create a domino effect that will harm U.S. national security for years to come by damaging the growing unmanned systems industry.

As the Pentagon moves resources and dollars to address this new era of strategic competition, unmanned systems — in the air, in space, in the sea and on land — will be the tip of the sword for our sailors, Marines, soldiers and airmen against rising geopolitical threats.

Launched last year, the Navy’s Unmanned Campaign Plan and related task force are two examples that demonstrate the extent to which DoD leaders understand the unparalleled value uncrewed systems will provide in achieving the vision presented in the National Defense Strategy.

However, the new normal of cycles of CRs results in real-dollar budget reductions and program delays that threaten the progress of this vision — and these losses harm both U.S. strategic competitiveness and the defense-industrial base. As Adm. Mike Gilday stated during the House Appropriations Committee hearing: “Every day matters in this critical decade.”

Appropriators must understand that the importance of full funding for the research, development, test and evaluation as well as the procurement of uncrewed systems at this moment cannot be overstated.

A full-year CR will prevent critical, new uncrewed systems programs from being initiated. This includes authorization of $57 million for the Marine Corps’ Group 5 UAS development project; projects totaling $52.5 million for the development of counter-small UAS capabilities; and $57.6 million dedicated to the maturation of technologies under the AFWERX prime project. By operating at FY21 funding levels, the program for small unmanned undersea vehicles will see only a third of its FY22 authorized budget.

These cuts represent significant losses of time and capital th

at the unmanned systems industry has spent in preparing systems for field action. The defense-industrial base has made investments in the technology, supply base, workforce, supply chain and infrastructure based on the DoD’s vision for the future.

Companies working to advance the front lines of innovation already face a “procurement trough” caused by delays and gaps in new programs. A full-year CR would set off an irreversible ripple effect that would deepen this trough for years to come.

Simply put, saddling companies nationwide with long-standing Capital Beltway problems prevents the development and adoption of critical tools. Smaller and midsized companies feel the impacts of these delays most, and continued delays will force them to move their investments away from unmanned systems to other, more predictable markets.

Until Congress puts American warfighters before political concerns, the U.S. will fall behind in the development, fielding and adoption of modern tools that support a full range of missions.

The time is now to make the DoD’s strategic visions reality by accelerating investments in air, surface and subsurface platforms. Congressional leaders must immediately work to build consensus in support of stable funding that enables the development and integration of uncrewed systems. The country is looking for assertive congressional leadership — now is the time to step up.

#### That causes nuclear war with Russia and china

Kroenig & Gopalaswamy 18, \*Associate Professor of Government and Foreign Service at Georgetown University and Deputy Director for Strategy in the Scowcroft Center for Strategy and Security at the Atlantic Council. \*\*Director of the South Asia Center at the Atlantic Council. He holds a PhD in mechanical engineering with a specialization in numerical acoustics from Trinity College, Dublin. (Matthew & Bharath, 11-12-2018, "Will disruptive technology cause nuclear war?", *Bulletin of the Atomic Scientists*, https://thebulletin.org/2018/11/will-disruptive-technology-cause-nuclear-war/)

Rather, we should think more broadly about how new technology might affect global politics, and, for this, it is helpful to turn to scholarly international relations theory. The dominant theory of the causes of war in the academy is the “bargaining model of war.” This theory identifies rapid shifts in the balance of power as a primary cause of conflict.

International politics often presents states with conflicts that they can settle through peaceful bargaining, but when bargaining breaks down, war results. Shifts in the balance of power are problematic because they undermine effective bargaining. After all, why agree to a deal today if your bargaining position will be stronger tomorrow? And, a clear understanding of the military balance of power can contribute to peace. (Why start a war you are likely to lose?) But shifts in the balance of power muddy understandings of which states have the advantage.

You may see where this is going. New technologies threaten to create potentially destabilizing shifts in the balance of power.

For decades, stability in Europe and Asia has been supported by US military power. In recent years, however, the balance of power in Asia has begun to shift, as China has increased its military capabilities. Already, Beijing has become more assertive in the region, claiming contested territory in the South China Sea. And the results of Russia’s military modernization have been on full display in its ongoing intervention in Ukraine.

Moreover, China may have the lead over the United States in emerging technologies that could be decisive for the future of military acquisitions and warfare, including 3D printing, hypersonic missiles, quantum computing, 5G wireless connectivity, and artificial intelligence (AI). And Russian President Vladimir Putin is building new unmanned vehicles while ominously declaring, “Whoever leads in AI will rule the world.”

If China or Russia are able to incorporate new technologies into their militaries before the United States, then this could lead to the kind of rapid shift in the balance of power that often causes war.

If Beijing believes emerging technologies provide it with a newfound, local military advantage over the United States, for example, it may be more willing than previously to initiate conflict over Taiwan. And if Putin thinks new tech has strengthened his hand, he may be more tempted to launch a Ukraine-style invasion of a NATO member.

Either scenario could bring these nuclear powers into direct conflict with the United States, and once nuclear armed states are at war, there is an inherent risk of nuclear conflict through limited nuclear war strategies, nuclear brinkmanship, or simple accident or inadvertent escalation.

This framing of the problem leads to a different set of policy implications. The concern is not simply technologies that threaten to undermine nuclear second-strike capabilities directly, but, rather, any technologies that can result in a meaningful shift in the broader balance of power. And the solution is not to preserve second-strike capabilities, but to preserve prevailing power balances more broadly.

## NASA

#### NASA is preserving resources by leveraging private partnerships

Miriam Kramer 21, author of Space, “NASA's plans for the future hinge on the success of private companies,” Axios, 12-7-2021, https://www.axios.com/nasa-private-spaceflight-plans-5a5710e6-5223-4da3-8c5d-5a712e1d862e.html

The private space players who will drive NASA's plans for the coming decade are declaring themselves and defining the stakes. Why it matters: NASA plans to focus on getting people to Mars and the Moon, and its deep space exploration ambitions hinge on the agency being able to successfully hand over major operations in low-Earth orbit to private companies. The space agency hopes companies will build private space stations that its astronauts can use and to continue to buy space on private rockets for launching its satellites and other payloads to orbit and beyond. NASA's "big experiment" right now is to test where these commercial partnerships work, the Planetary Society's Casey Dreier told Axios. What's happening: Last week, NASA announced it would award multimillion-dollar contracts to three teams of commercial space companies to start designing and building privately operated space stations.

#### Plan forces spending trade-offs that crush effective Earth sciences and mining --- risks catastrophic climate change

Haymet 7 (Tony, Director of the Scripps Institution of Oceanography – University of California, San Diego, Mark Abbott, Dean of the College of Oceanic and Atmospheric Science – Oregon State University, and Jim Luyten, Acting Director – Woods Hole Oceanographic Institution, “The Planet NASA Needs to Explore”, Washington Post, 5-10, [http://www.washingtonpost.com/wp-dyn/content/article/2007/05/09/AR2007050902451.html](http://www.lexis.com/research/retrieve))

Decades ago, a shift in NASA priorities sidelined progress in human space exploration. As momentum gathers to reinvigorate human space missions to the moon and Mars, we risk hurting ourselves, and Earth, in the long run. Our planet -- not the moon or Mars -- is under significant threat from the consequences of rapid climate change. Yet the changing NASA priorities will threaten exploration here at home.

NASA not only launches shuttles and builds space stations, it also builds and operates our nation's satellites that observe and monitor the Earth. These satellites collect crucial global data on winds, ice and oceans. They help us forecast hurricanes, track the loss of Arctic sea ice and the rise of sea levels, and understand and prepare for climate changes.

NASA's budget for science missions has declined 30 percent in the past six years, and that trend is expected to continue. As more dollars are reallocated to prepare for missions back to the moon and Mars, sophisticated new satellites to observe the Earth will be delayed, harming Earth sciences.

The National Academy of Sciences has noted that the Landsat satellite system, which takes important measurements of global vegetation, is in its fourth decade of operation and could fail without a clear plan for continuation. The same is true for the QuikSCAT satellite, which provides critical wind data used in forecasting hurricanes and El Niño effects.

In January, a partnership of university and NASA scientists demonstrated that climate change and higher ocean temperatures were reducing the growth of microscopic plants and animals at the heart of the marine food web.

Their analysis was based on nearly a decade of NASA satellite measurements of ocean color, which unfortunately are at risk of being interrupted for several years.

Sea levels are rising, and the Arctic Ocean may be ice-free in summer. The buildup of carbon dioxide in the oceans threatens to make them more acidic, which may in turn hinder the ability of some types of marine life, including corals, to build their shells and skeletons. We must learn as much as we can to assess these threats and develop solutions.

Satellites provide coverage of vast, remote regions of our planet that would otherwise remain unseen, especially the oceans, which play an important role in climate change. Without accurate data on such fundamentals as sea surface height, temperatures and biomass, as well as glacier heights and snowpack thickness, we will not be able to understand the likelihood of dangers such as more severe hurricanes along the Gulf Coast or more frequent forest fires in the Pacific Northwest.

Climate change is the most critical problem the Earth has ever faced.

Government agencies and the private sector, as well as individual citizens, need to better grasp the risks and potential paths of global climate change. Mitigating these risks and preparing for the effects of warming will require scientific understanding of how our complex planet operates, how it is changing, and how that change will affect the environment and human society.

John F. Kennedy's brilliant call to put a man on the moon by the end of the 1960s set an arbitrary deadline, but the deadline we face today is set by nature. NASA must continue to play a vital role in helping find ways to protect our planet for (and perhaps from) its intelligent life. Exploration of space is a noble quest. But we can't afford to be so starry-eyed that we overlook our own planet.

#### Commercial mining solves extinction from scarcity, terror, war, and disease. – this is an independent scenario

Pelton 17—(Director Emeritus of the Space and Advanced Communications Research Institute at George Washington University, PHD in IR from Georgetown).. Pelton, Joseph N. 2017. The New Gold Rush: The Riches of Space Beckon! Springer. Accessed 8/30/19.

Are We Humans Doomed to Extinction? What will we do when Earth’s resources are used up by humanity? The world is now hugely over populated, with billions and billions crammed into our overcrowded cities. By 2050, we may be 9 billion strong, and by 2100 well over 11 billion people on Planet Earth. Some at the United Nations say we might even be an amazing 12 billion crawling around this small globe. And over 80 % of us will be living in congested cities. These cities will be ever more vulnerable to terrorist attack, natural disaster, and other plights that come with overcrowding and a dearth of jobs that will be fueled by rapid automation and the rise of artifi cial intelligence across the global economy. We are already rapidly running out of water and minerals. Climate change is threatening our very existence. Political leaders and even the Pope have cautioned us against inaction. Perhaps the naysayers are right. All humanity is at tremendous risk. Is there no hope for the future? This book is about hope. We think that there is literally heavenly hope for humanity. But we are not talking here about divine intervention. We are envisioning a new space economy that recognizes that there is more water in the skies that all our oceans. Th ere is a new wealth of natural resources and clean energy in the reaches of outer space—more than most of us could ever dream possible. There are those that say why waste money on outer space when we have severe problems here at home? Going into space is not a waste of money. It is our future. It is our hope for new jobs and resources. The great challenge of our times is to reverse public thinking to see space not as a resource drain but as the doorway to opportunity. The new space frontier can literally open up a “gold rush in the skies.” In brief, we think there is new hope for humanity. We see a new a pathway to the future via new ventures in space. For too long, space programs have been seen as a money pit. In the process, we have overlooked the great abundance available to us in the skies above. It is important to recognize there is already the beginning of a new gold rush in space—a pathway to astral abundance. “New Space” is a term increasingly used to describe radical new commercial space initiatives—many of which have come from Silicon Valley and often with backing from the group of entrepreneurs known popularly as the “space billionaires.” New space is revolutionizing the space industry with lower cost space transportation and space systems that represent significant cost savings and new technological breakthroughs. “New Commercial Space” and the “New Space Economy” represent more than a new way of looking at outer space. These new pathways to the stars could prove vital to human survival. If one does not believe in spending money to probe the mysteries of the universe then perhaps we can try what might be called “calibrated greed” on for size. One only needs to go to a cubesat workshop, or to Silicon Valley or one of many conferences like the “Disrupt Space” event in Bremen, Germany, held in April 2016 to recognize that entrepreneurial New Space initiatives are changing everything [ 1 ]. In fact, the very nature and dimensions of what outer space activities are today have changed forever. It is no longer your grandfather’s concept of outer space that was once dominated by the big national space agencies. The entrepreneurs are taking over. The hopeful statements in this book and the hard economic and technical data that backs them up are more than a minority opinion. It is a topic of growing interest at the World Economic Forum, where business and political heavyweights meet in Davos, Switzerland, to discuss how to stimulate new patterns of global economic growth. It is even the growing view of a group that call themselves “space ethicists.” Here is how Christopher J. Newman, at the University of Sunderland in the United Kingdom has put it: Space ethicists have offered the view that space exploration is not only desirable; it is a duty that we, as a species, must undertake in order to secure the survival of humanity over the longer term. Expanding both the resource base and, eventually, the habitats available for humanity means that any expenditure on space exploration, far from being viewed as frivolous, can legitimately be rationalized as an ethical investment choice. (Newman) On the other hand there are space ethicists and space exobiologists who argue that humans have created ecological ruin on the planet—and now space debris is starting to pollute space. Th ese countervailing thoughts by the “no growth” camp of space ethicists say we have no right to colonize other planets or to mine the Moon and asteroids—or at least no right to do so until we can prove we can sustain life here on Earth for the longer term. However, for most who are planning for the new space economy the opinion of space philosophers doesn’t really fl oat their boat. Legislators, bankers, and aspiring space entrepreneurs are far more interested in the views of the super-rich capitalists called the space billionaires. A number of these billionaires and space executives have already put some very serious money into enterprises intent on creating a new pathway to the stars. No less than five billionaires with established space ventures—Elon Musk, Paul Allen, Jeff Bezos, Sir Richard Branson, and Robert Bigelow—have invested millions if not billions of dollars into commercializing space. They are developing new technologies and establishing space enterprises that can bring the wealth of outer space down to Earth. This is not a pipe dream, but will increasingly be the economic reality of the 2020s. These wealthy space entrepreneurs see major new economic opportunities. To them space represents the last great frontier for enterprising pioneers. Th us they see an ever-expanding space frontier that offers opportunities in low-cost space transportation, satellite solar power satellites to produce clean energy 24h a day, space mining, space manufacturing and production, and eventually space habitats and colonies as a trajectory to a better human future. Some even more visionary thinkers envision the possibility of terraforming Mars, or creating new structures in space to protect our planet from cosmic hazards and even raising Earth’s orbit to escape the rising heat levels of the Sun in millennia to come. Some, of course, will say this is sci-fi hogwash. It can’t be done. We say that this is what people would have said in 1900 about airplanes, rocket ships, cell phones and nuclear devices. The skeptics laughed at Columbus and his plan to sail across the oceans to discover new worlds. When Thomas Jefferson bought the Louisiana Purchase from France or Seward bought Alaska, there were plenty of naysayers that said such investment in the unknown was an extravagant waste of money. A healthy skepticism is useful and can play a role in economic and business success. Before one dismisses the idea of an impending major new space economy and a new gold rush, it might useful to see what has already transpired in space development in just the past five decades. The world’s first geosynchronous communications satellite had a throughput capability of about 500 kb / s. In contrast, today’s state of the art Viasat 2 —a half century later— has an impressive throughput of some 140 Gb/s. Th is means that the relative throughput is nearly 300,000 greater, while its lifetime is some ten times longer (Figs. 1.1 and 1.2 ). Each new generation of communications satellite has had more power, better antenna systems, improved pointing and stabilization, and an extended lifetime. And the capabilities represented by remote sensing satellites , meteorological satellites , and navigation and timing satellites have also expanded their capabilities and performance in an impressive manner. When satellite applications first started, the market was measured in millions of dollars. Today commercial satellite services exceed a quarter of a billion dollars. Vital services such as the Internet, aircraft traffi c control and management, international banking, search and rescue and much, much more depend on application satellites. Th ose that would doubt the importance of satellites to the global economy might wish to view on You Tube the video “If Th ere Were a Day Without Satellites?” [ 2 ]. Let’s check in on what some of those very rich and smart guys think about the new space economy and its potential. (We are sorry to say that so far there are no female space billionaires, but surely this, too, will come someday soon.) Of course this twenty-fi rst century breakthrough that we call the New Space economy will not come just from new space commerce. It will also come from the amazing new technologies here on Earth. Vital new terrestrial technologies will accompany this cosmic journey into tomorrow. Information technology, robotics, artificial intelligence and commercial space travel systems have now set us on a course to allow us humans to harvest the amazing riches in the skies—new natural resources, new energy, and even totally new ways of looking at the purpose of human existence. If we pursue this course steadfastly, it can be the beginning of a New Space renaissance. But if we don’t seek to realize our ultimate destiny in space, Homo sapiens can end up in the dustbin of history—just like literally millions of already failed species. In each and every one of the five mass extinction events that have occurred over the last 1.5 billion years on Earth, some 50–80 % of all species have gone the way of the T. Rex, the woolly mammoth, and the Dodo bird along with extinct ferns, grasses and cacti. On the other hand, the best days of the human race could be just beginning. If we are smart about how we go about discovering and using these riches in the skies and applying the best of our new technologies, it could be the start of a new beginning for humanity. Konstantin Tsiokovsky, the Russian astronautics pioneer, who fi rst conceived of practical designs for spaceships, famously said: “A planet is the cradle of mankind, but one cannot live in a cradle forever.” Well before Tsiokovsky another genius, Leonardo da Vinci, said, quite poetically: “Once you have tasted flight, you will forever walk the earth with your eyes turned skyward, for there you have been, and there you will always long to return.” The founder of the X-Prize and of Planetary Resources, Inc., Dr. Peter Diamandis, has much more brashly said much the same thing in quite diff erent words when he said: “The meek shall inherit the Earth. The rest of us will go to Mars.” The New Space Billionaires Peter Diamandis is not alone in his thinking. From the list of “visionaries” quoted earlier, Elon Musk, the founder of SpaceX; Sir Richard Branson, the founder of Virgin Galactic; and Paul Allen, the co-founder of Microsoft and the man who financed SpaceShipOne, the world’s first successful spaceplane have all said the future will include a vibrant new space economy. Th ey, and others, have said that we can, we should and we soon shall go into space and realize the bounty that it can offer to us. Th e New Space enterprise is today indeed being led by those so-called space billionaires , who have an exciting vision of the future. They and others in the commercial space economy believe that the exploitation of outer space may open up a new golden age of astral abundance. They see outer space as a new frontier that can be a great source of new materials, energy and various forms of new wealth that might even save us from excesses of the past. Th is gold rush in the skies represents a new beginning. We are not talking about expensive new space ventures funded by NASA or other space agencies in Europe, Japan, China or India. No, these eff orts which we and others call New Space are today being forged by imaginative and resourceful commercial entrepreneurs. Th ese twenty-fi rst century visionaries have the fortitude and zeal to look to the abundance above. New breakthroughs in technology and New Space enterprises may be able to create an “astral life raft” for humanity. Just as Columbus and the Vikings had the imaginative drive that led them to discover the riches of a new world, we now have a cadre of space billionaires that are now leading us into this New Space era of tomorrow. These bold leaders, such as Paul Allen and Sir Richard Branson, plus other space entrepreneurs including Jeff Bezos of Amazon and Blue Origin, and Robert Bigelow, Chairman of Budget Suites and Bigelow Aerospace, not only dream of their future in the space industry but also have billions of dollars in assets. These are the bright stars of an entirely new industry that are leading us into the age of New Space commerce. These space billionaires, each in their own way, are proponents of a new age of astral abundance. Each of them is launching new commercial space industries. They are literally transforming our vision of tomorrow. These new types of entrepreneurial aerospace companies—the New Space enterprises—give new hope and new promise of transforming our world as we know it today. The New Space Frontier What happens in space in the next few decades, plus corresponding new information technologies and advanced robotics, will change our world forever. These changes will redefi ne wealth, change our views of work and employment and upend almost everything we think we know about economics, wealth, jobs, and politics. Th ese changes are about truly disruptive technologies of the most fundamental kinds. If you thought the Internet, smart phones, and spandex were disruptive technologies, just hang on. You have not seen anything yet. In short, if you want to understand a transition more fundamental than the changes brought to the twentieth century world by computers, communications and the Internet, then read this book. There are truly riches in the skies. Near-Earth asteroids largely composed of platinum and rare earth metals have an incredible value. Helium-3 isotopes accessible in outer space could provide clean and abundant energy. There is far more water in outer space than is in our oceans. In the pages that follow we will explain the potential for a cosmic shift in our global economy, our ecology, and our commercial and legal systems. These can take place by the end of this century. And if these changes do not take place we will be in trouble. Our conventional petro-chemical energy systems will fail us economically and eventually blanket us with a hydrocarbon haze of smog that will threaten our health and our very survival. Our rare precious metals that we need for modern electronic appliances will skyrocket in price, and the struggle between “haves” and “have nots” will grow increasingly ugly. A lack of affordable and readily available water, natural resources, food, health care and medical supplies, plus systematic threats to urban security and systemic warfare are the alternatives to astral abundance. The choices between astral abundance and a downward spiral in global standards of living are stark. Within the next few decades these problems will be increasingly real. By then the world may almost be begging for new, out of- the-box thinking. International peace and security will be an indispensable prerequisite for exploitation of astral abundance, as will good government for all. No one nation can be rich and secure when everyone else is poor and insecure. In short, global space security and strategic space defense, mediated by global space agreements, are part of this new pathway to the future.

#### Warming is inevitable but adjusting government policy can address the worst effects – specifically, for sea level rise. US responses are modeled globally.

**Economist 17**, "How government policy exacerbates hurricanes like Harvey," Economist, https://www.economist.com/news/leaders/21727898-if-global-warming-were-not-enough-threat-poor-planning-and-unwise-subsidies-make-floods

THE extent of the devastation will become clear only when the floodwater recedes, leaving ruined cars, filthy mud-choked houses and the bloated corpses of the drowned. But as we went to press, with the rain pounding South Texas for the sixth day, Hurricane Harvey had already set records as America’s most severe deluge (see Briefing). In Houston it drenched Harris County in over 4.5trn litres of water in just 100 hours—enough rainfall to cover an eight-year-old child. The fate of America’s fourth-largest city holds the world’s attention, but it is hardly alone. In India, Bangladesh and Nepal, at least 1,200 people have died and millions have been left homeless by this year’s monsoon floods. Last month torrential rains caused a mudslide in Sierra Leone that killed over 1,000—though the exact toll will never be known. Around the world, governments are grappling with the threat from floods. This will ultimately be about dealing with climate change. Just as important, is correcting short-sighted government policy and the perverse incentives that make flooding worse. Judgment day The overwhelming good news is that storms and flooding have caused far fewer deaths in recent decades, thanks to better warning systems and the construction of levees, ditches and shelters. The cyclone that struck Bangladesh in 1970 killed 300,000-500,000 people; the most recent severe one, in 2007, killed 4,234. The bad news is that storms and floods still account for almost three-quarters of weather-related disasters, and they are becoming more common. According to the Munich Re, a reinsurer, their number around the world has increased from about 200 in 1980 to over 600 last year. Harvey was the third “500-year” storm to strike Houston since 1979. At the same time, floods and storms are also becoming more costly. By one estimate, three times as many people were living in houses threatened by hurricanes in 2010 as in 1970, and the number is expected to grow as still more people move to coastal cities. The UN reckons that, in the 20 years to 2015, storms and floods caused $1.7trn of destruction; the World Health Organisation estimates that, in real terms, the global cost of hurricane damage is rising by 6% a year. Flood losses in Europe are predicted to increase fivefold by 2050. One cause is global warming. The frequency and severity of hurricanes vary naturally—America has seen unusually few in the past decade. Yet the underlying global trend is what you would expect from climate change. Warmer seas evaporate faster and warmer air can hold more water vapour, which releases energy when it condenses inside a weather system, feeding the violence of storms and the intensity of deluges. Rising sea levels, predicted to be especially marked in the Gulf of Mexico, exacerbate storm surges, adding to the flooding. Harvey was unusually devastating because it suddenly gained strength before it made landfall on Friday; it then stayed put, dumping its rain on Houston before returning to the Gulf. Again, that is consistent with models of a warmer world. Poor planning bears even more blame. Houston, which has almost no restrictions on land-use, is an extreme example of what can go wrong. Although a light touch has enabled developers to cater to the city’s rapid growth—1.8m extra inhabitants since 2000—it has also led to concrete being laid over vast areas of coastal prairie that used to absorb the rain. According to the Texas Tribune and ProPublica, a charity that finances investigative journalism, since 2010 Harris County has allowed more than 8,600 buildings to be put up inside 100-year floodplains, where floods have a 1% chance of occurring in any year. Developers are supposed to build ponds to hold run-off water that would have soaked into undeveloped land, but the rules are poorly enforced. Because the maps are not kept up to date, properties supposedly outside the 100-year floodplain are being flooded repeatedly. Government failure adds to the harm. Developing countries are underinsured against natural disasters. Swiss Re, a reinsurer, says that of the $50bn or so of losses to floods, cyclones and other disasters in Asia in 2014, only 8% were covered. The Bank of International Settlements calculates that the worst natural catastrophes typically permanently lower the afflicted country’s GDP by almost 2%. America has the opposite problem—the federal government subsidises the insurance premiums of vulnerable houses. The National Flood Insurance Programme (NFIP) has been forced to borrow because it fails to charge enough to cover its risk of losses. Underpricing encourages the building of new houses and discourages existing owners from renovating or moving out. According to the Federal Emergency Management Agency, houses that repeatedly flood account for 1% of NFIP’s properties but 25-30% of its claims. Five states, Texas among them, have more than 10,000 such households and, nationwide, their number has been going up by around 5,000 each year. Insurance is meant to provide a signal about risk; in this case, it stifles it. Mend the roof while the sun shines What to do? Flooding strengthens the case for minimising climate change, which threatens to make wet places wetter and storms stormier. Even those who doubt the science would do well to see action as an insurance policy that pays out if the case is proven. However, that will not happen fast, even if all countries, including America, sign up to international agreements. More immediately, therefore, politicians can learn from Houston. Cities need to protect flood defences and catchment areas, such as the wetlands around Kolkata and the lakes in and around Pokhara in Nepal, whose value is becoming clear. Flood maps need to be up to date. Civil engineers, often starved of funds and strangled by bureaucracy, should be building and reinforcing levees and reservoirs now, before it is too late. The NFIP should start to charge market premiums and developing countries should sell catastrophe bonds. All this is a test of government, of foresight and the ability to withstand the lobbying of homeowners and developers. But politicians and officials who fail the test need to realise that, sooner or later, they will wake up to a Hurricane Harvey of their own.

#### The impact’s global war

Eric **Holthaus 15**, editor at rollingstone magazine citing James Hansen, former NASA climatologist, "The Point of No Return: Climate Change Nightmares Are Here," Rolling Stone, accessed 10-23-2016, http://www.rollingstone.com/politics/news/the-point-of-no-return-climate-change-nightmares-are-already-here-20150805

On July 20th, James Hansen, the former NASA climatologist who brought climate change to the public's attention in the summer of 1988, issued a bombshell: He and a team of climate scientists had identified a newly important feedback mechanism off the coast of Antarctica that suggests mean sea levels could rise 10 times faster than previously predicted: 10 feet by 2065. The authors included this chilling warning: If emissions aren't cut, "We conclude that multi-meter sea-level rise would become practically unavoidable. Social disruption and economic consequences of such large sea-level rise could be devastating. It is not difficult to imagine that conflicts arising from forced migrations and economic collapse might make the planet ungovernable, threatening the fabric of civilization."

## China

#### Xi’s regime is stable now, but its success depends on strong growth and private sector development.

**Mitter and Johnson 21** [Rana Mitter and Elsbeth Johnson, [Rana Mitter](https://hbr.org/search?term=rana%20mitter&search_type=search-all) is a professor of the history and politics of modern China at Oxford. [Elsbeth Johnson](https://hbr.org/search?term=elsbeth%20johnson&search_type=search-all), formerly the strategy director for Prudential PLC’s Asian business, is a senior lecturer at MIT’s Sloan School of Management and the founder of SystemShift, a consulting firm. May-June 2021, "What the West Gets Wrong About China," Harvard Business Review, [https://hbr.org/2021/05/what-the-west-gets-wrong-about-china accessed 12/14/21](https://hbr.org/2021/05/what-the-west-gets-wrong-about-china%20accessed%2012/14/21)] Adam

In China, however, growth has come in the context of stable communist rule, suggesting that democracy and growth are not inevitably mutually dependent. In fact, many Chinese believe that the country’s recent economic achievements—large-scale poverty reduction, huge infrastructure investment, and development as a world-class tech innovator—have come about because of, not despite, China’s authoritarian form of government. Its aggressive handling of Covid-19—in sharp contrast to that of many Western countries with higher death rates and later, less-stringent lockdowns—has, if anything, reinforced that view.

China has also defied predictions that its authoritarianism would inhibit its capacity to [innovate](https://hbr.org/2011/06/what-the-west-doesnt-get-about-china). It is a global leader in AI, biotech, and space exploration. Some of its technological successes have been driven by market forces: People wanted to buy goods or communicate more easily, and the likes of Alibaba and Tencent have helped them do just that. But much of the technological progress has come from a highly innovative and well-funded military that has invested heavily in China’s burgeoning new industries. This, of course, mirrors the role of U.S. defense and intelligence spending in the development of Silicon Valley. But in China the consumer applications have come faster, making more obvious the link between government investment and products and services that benefit individuals. That’s why ordinary Chinese people see Chinese companies such as Alibaba, Huawei, and TikTok as sources of national pride—international vanguards of Chinese success—rather than simply sources of jobs or GDP, as they might be viewed in the West.

Thus July 2020 polling data from the Ash Center at Harvard’s Kennedy School of Government revealed 95% satisfaction with the Beijing government among Chinese citizens. Our own experiences on the ground in China confirm this. Most ordinary people we meet don’t feel that the authoritarian state is solely oppressive, although it can be that; for them it also provides opportunity. A cleaner in Chongqing now owns several apartments because the CCP reformed property laws. A Shanghai journalist is paid by her state-controlled magazine to fly around the world for stories on global lifestyle trends. A young student in Nanjing can study propulsion physics at Beijing’s Tsinghua University thanks to social mobility and the party’s significant investment in scientific research.

#### Cross apply 1AC Patel – it proves that the private sector is seen as key to ccp legitimacy

#### Shifts in regime perception threatens CCP’s legitimacy from nationalist hardliners

Weiss 19 Jessica Weiss 1-29-2019 “Authoritarian Audiences, Rhetoric, and Propaganda in International Crises: Evidence from China” <http://www.jessicachenweiss.com/uploads/3/0/6/3/30636001/19-01-24-elite-statements-isq-ca.pdf> (Associate Professor of Government at Cornell University)//Elmer

Public support—or the appearance of it—matters to many autocracies. As Ithiel de Sola Pool writes, modern dictatorships are “highly conscious of public opinion and make major efforts to affect it.”6 Mao Zedong told his comrades: “When you make revolution, you must first manage public opinion.”7 Because autocracies often rely on **nationalist mythmaking**,8 success or failure in defending the national honor in international crises could burnish the leadership’s patriotic credentials or spark opposition. **Shared outrage at the regime’s foreign policy failures could galvanize street protests or elite fissures, creating intraparty upheaval** or inviting military officers to step in to restore order. Fearing a domestic backlash, authoritarian leaders may feel compelled to take a tough international stance. Although authoritarian leaders are rarely held accountable to public opinion through free and fair elections, fears of popular unrest and irregular ouster often weigh heavily on autocrats seeking to maximize their tenure in office. Considering the harsh consequences that authoritarian elites face if pushed out of office, even a small increase in the probability of ouster could alter authoritarian incentives in international crises.9 A history of nationalist uprisings make Chinese citizens and leaders especially aware of the linkage between international disputes and domestic unrest. The weakness of the PRC’s predecessor in defending Chinese sovereignty at the Paris Peace Conference in 1919 galvanized protests and a general strike, forcing the government to sack three officials and reject the Treaty of Versailles, which awarded territories in China to Japan. These precedents have made Chinese officials particularly sensitive to the appearance of hewing to public opinion. As the People’s Daily chief editor wrote: “History and reality have shown us that public opinion and regime safety are inseparable.”10 One Chinese scholar even claimed: “the Chinese government probably knows the public’s opinion better and reacts to it more directly than even the U.S. government.”11

#### Xi will launch diversionary war to domestic backlash – escalates in multiple hotspots and causes nuclear war

Norris 17, William J. Geostrategic Implications of China’s Twin Economic Challenges. CFR Discussion Paper, 2017. (Associate professor of Chinese foreign and security policy at Texas A&M University’s Bush School of Government and Public Service)//Elmer

Populist pressures might tempt the **party leadership** to encourage **diversionary nationalism**. The logic of this concern is straightforward: the Communist Party might seek to **distract a restless domestic population** with **adventurism abroad**.19 The **Xi** administration wants to **appear tough** in its **defense of foreign encroachments** against China’s interests. This need stems from a long-running narrative about how a weak Qing dynasty was unable to defend China in the face of European imperial expansion, epitomized by the Opium Wars and the subsequent treaties imposed on China in the nineteenth century. The party is **particularly sensitive** to **perceptions of weakness** because much of its **claim to legitimacy**—manifested in **Xi’s Chinese Dream** campaign today—stems from the party’s claims of leading the **restoration of Chinese greatness**. For example, the May Fourth Movement, a popular protest in 1919 that helped catalyze the CPC, called into question the legitimacy of the Republic of China government running the country at that time because the regime was seen as not having effectively defended China’s territorial and sovereignty interests at the Versailles Peace Conference. **Diversionary nationalist frictions** would likely occur if the Chinese leadership portrayed a foreign adversary as having made the first move, thus forcing Xi to stand up for China’s interests. An example is the 2012 attempt by the nationalist governor of Tokyo, Shintaro Ishihara, to buy the Senkaku/Diaoyu Islands from a private owner.20 Although the Japanese central government sought to avert a crisis by stepping in to purchase the islands—having them bought and administered by Ishihara’s Tokyo metropolitan government would have dragged Japan into a confrontation with China—China saw this move as part of a deliberate orchestration by Japan to nationalize the islands. Xi seemingly had no choice but to defend China’s claims against an attempt by Japan to consolidate its position on the dispute.21 This issue touched off a period of heated tensions between China and Japan, lasting more than two years.22 Such dynamics are not limited to Japan. Other possible areas of conflict include, but are not necessarily limited to, **Taiwan**, **India**, and the **South China Sea** (especially with the **Philippines** and **Vietnam**). The Chinese government will use such tactics if it believes that the costs are relatively low. Ideally, China would like to appear tough while avoiding material repercussions or a serious diplomatic breakdown. Standing up against foreign encroachment—without facing much blowback—could provide Xi’s administration with a tempting source of noneconomic legitimacy. However, over the next few years, Xi will probably not be actively looking to get embroiled abroad. Cushioning the fallout from slower growth while managing a structural economic transition will be difficult enough. Courting potential international crises that distract the central leadership would make this task even more daunting. Even if the top leadership did not wish to provoke conflict, a smaller budgetary allotment for security could cause **military interests** in China to **deliberately instigate trouble** to **justify** their **claims over increasingly scarce resources**. For example, an air force interested in ensuring its funding for a midair tanker program might find the existence of far-flung territorial disputes to be useful in making its case. Such a case would be made even stronger by a pattern of recent frictions that highlights the necessity of greater air power projection. Budgetary pressures may be partly behind a recent People’s Liberation Army reorganization and headcount reduction. A slowing economy might cause a further deceleration in China’s military spending, thus increasing such pressures as budgetary belts tighten. Challenges to Xi’s Leadership Xi Jinping’s efforts to address economic challenges could fail, unleashing consequences that extend well beyond China’s economic health. For example, an **economic collapse** could give rise to a Vladimir **Putin–like redemption figure** in China. Xi’s approach of centralizing authority over a diverse, complex, and massive social, political, and economic system is a **recipe for brittleness**. Rather than designing a resilient, decentralized governance structure that can gracefully cope with localized failures at particular nodes in a network, a highly centralized architecture **risks catastrophic**, **system-level failure**. Although centralized authority offers the tantalizing chimera of stronger control from the center, it also puts all the responsibility squarely on Xi’s shoulders. With China’s ascension to great power status, the consequences of internecine domestic political battles are increasingly playing out on the world stage. The international significance of China’s domestic politics is a new paradigm for the Chinese leadership, and one can expect an adjustment period during which the outcome of what had previously been relatively insulated domestic political frictions will likely generate **unintended international repercussions**. Such dynamics will influence Chinese foreign policy and security behavior. Domestic arguments over ideology, bureaucratic power struggles, and strategic direction could all have **ripple effects abroad**. Many of China’s party heavyweights still employ a narrow and exclusively domestic political calculus. Such behavior increases the possibility of international implications that are not fully anticipated, **raising the risks** of **strategic miscalculation** on the world stage. For example, the factional power struggles that animated the Cultural Revolution were largely driven by domestic concerns, yet manifested themselves in Chinese foreign policy for more than a decade. During this period, China was not the world’s second largest economy and, for much of this time, did not even have formal representation at the United Nations. If today’s globally interconnected China became engulfed in similar domestic chaos, the effects would be felt worldwide.23 Weakened Fetters of Economic Interdependence If China successfully transitioned away from its export-driven growth model toward a consumption-driven economic engine over the next four or five years, it could no longer feel as constrained by economic interdependence. To the extent that such constraints are loosened, the U.S.-China relationship will be more prone to conflict and friction.24 While China has never been the archetypal liberal economic power bent on benign integration with the global economy, its export-driven growth model produced a strong strategic preference for stability. Although past behavior is not necessarily indicative of future strategic calculus, China’s “economic circuit breaker” logic seems to have held its most aggressive nationalism below the threshold of war since 1979. A China that is both comparatively strong and less dependent on the global economy would be a novel development in modern geopolitics. As China changes the composition of its international economic linkages, global integration could place fewer constraints on it. Whereas China has been highly reliant on the import of raw materials and semifinished goods for reexport, a consumption-driven China could have a different international trade profile. China could still rely on imported goods, but their centrality to the country’s overall economic growth would be altered. Imports of luxury goods, consumer products, international brands, and services may not exert a significant constraining influence, since loss of access to such items may not be seen as strategically vital. If these flows were interrupted or jeopardized, the result would be more akin to an inconvenience than a strategic setback for China’s rise. That said, China is likely to continue to highly depend on imported oil even if the economic end to which that energy resource is directed shifts away from industrial and export production toward domestic consumption.

## Africa

#### LEO is uniquely accessible to African industry due to cheaper launch and production costs – that solves Earth Observation, internet, national security, and spills over to enrich the economy

Samanga 21 Ruvimbo Samanga, Zimbabwean scholar and lawyer working with the Space Law & Policy, holds a BA Law (cum laude), an LLB and an LLM in International Trade and Investment Law from the University of Pretoria. "Why Africa Should Expand its Mega-Satellite Constellation Capacity." Space Legal Issues, 3 May. 2021, www.spacelegalissues.com/why-africa-should-expand-its-mega-satellite-constellation-capacity.

Since 1988, Africa has spent approx. USD$4 billion towards the launch of 41 satellites (excluding the cost of the RASCOM-QAF 1R replacement). 30 of these satellites fall into the Small Satellite market. The majority of satellites owned by African institutions typically involves satellites with less than 600kgs in fueled mass and 24 of these satellites have less than 200kg fueled mass. The reason for the interest in the miniaturized satellites? In a nutshell, they offer cheaper design alternatives, coupled with the ease of mass production. They are also significantly more versatile in certain applications, owing to their reduced size. For example, they are the satellite of choice for low data rate communications, being launched in large multi-coverage constellations in Low Earth Orbit (LEO). It comes as no surprise then that small satellites are growing increasingly popular amongst developing countries, no less within the region, for the accessibility. The growth of the small satellite industry is evident in commercial as well as large programs which exhibit steady growth. In 2019, 5 African countries launched 8 satellites, 6 of which were small satellites. It is expected that by the year 2024, 19 African countries would have launched additional satellites into space. These small, sometimes called nano-satellites, are really driving the African space program, especially in line with the African Union’s (AU) science and technology ambitions which are expected to reap huge benefits for the continent. Most importantly through the AU Science, Technology and Innovation Science Strategy for Africa – 2024 (STISA-2024). Small satellites are categorized as space systems of up to 600 kg (falling into the categories of Minisatellites, Microsatellite, Nanosatellite, Picosatellite, and Femto Satellites). They range across different applications (Satellite Communications, Imaging & Earth Observations, Space Situational Awareness, and Technology Development), and have different end users (Government & Defense, and Civil & Commercial). Of the 8 satellites launched in 2019, 6 were small satellites (3 Nanosatellites, 2 Microsatellites, and 1 Picosatellite). Satellite communications mega-constellations are on the rise, however this growing interest is not without its challenges and uncertainties. The biggest risks in the small sat interest in the coming years are mostly ascribed to investor’s rick assessment & funding availability; Securing customers & Return on Investment (ROI); Stronger regulations; Competition from heavier satellite, and reliability. This is also further compounded by the fact that establishing a satellite service industry which is sustainable requires adequate funding. Skillset deficit is also a prominent challenge. Even though Africa has and will in future have the largest population of young people, the youth are generally not interested in pursuing careers in STEM (science, technology, engineering and mathematics). You can expect more satellites to be launched despite these crises. As regards the African Small Sat market, the growth perspectives seem to point towards predominant university projects which demonstrates a capacity to operate Smallsats, also attesting to the affordability of the systems. This is also a sign of government effort to support the growth of this industry, and the contributions of the youth in satellite development. Indeed the manufacturing ability is extremely important, but also the service capability and development prospects. Despite these positive steps there is still quite a need for funding in this area. Of the overall revenue and results, Earth Observation is the most predominant small sat use, however it is expected in the next few years this may shift to internet broadband, but ultimately, creating value for users and enabling services that drive industry development will be the ultimate determining factor. Internet coverage allows people to create capacity and this might undoubtedly be Africa’s most prolific use of small satellite solutions. CubeSats which are around 50 kg, are the most popular and are only getting bigger because of the interest for carrying larger payloads. But in future it may become less stringent to use the restricted platform, but the threshold is bound to switch to a smaller regular platform. These services are enabled through satellite mega-constellations. Satellite mega-constellations operate in the Lower Earth Orbit which is described as the orbit located no more than 2,000 kilometers from the Earth’s surface. There is room for LEO regarding low-latency connectivity. But this does not mean that the Geostationary Orbit will become redundant, rather, and on the other hand GEO will remain an asset for broadband, because of its efficiency and coverage as well as less-sophisticated ground segments. Nevertheless, the LEO offers the most advantageous orbital resource to come and deserves much policy intervention to regulate, owing to the fact that it is a finite, scare resource. At the end of the day, whether Smallsats are launched in a constellation or as individual space systems, they offer a cost-effective alternative to traditional space objects, and would allow Africa the opportunity to release its potential in various areas of interest including but not limited to communications, global positioning and navigation, and Earth observation. Africa would be enriched by the ability to use this new technology to enable users through diverse services, to protect assets within the value chain, or simply to monitor areas of national security such as the environment and borders. These are all aspects which will have a substantial developmental impact in the African economy, and is well aligned to the African space policy which speaks towards increase of space and satellite capacity in an affordable and beneficial manner.

### Warming

#### LEO Earth Science Observation Satellites uniquely solve a host of environmental threats – pollution, climate change, biod, defo, soil erosion

Ustin and Middleton 20 Ustin, S.L. [John Muir Institute of the Environment, University of California, Davis] , Middleton, E.M [NASA/Goddard Space Flight Center (Emerita)]. Current and near-term advances in Earth observation for ecological applications. Ecol Process 10, 1 (2021). https://doi.org/10.1186/s13717-020-00255-4

There is an unprecedented array of new satellite technologies with capabilities for advancing our understanding of ecological processes and the changing composition of the Earth’s biosphere at scales from local plots to the whole planet. We identified 48 instruments and 13 platforms with multiple instruments that are of broad interest to the environmental sciences that either collected data in the 2000s, were recently launched, or are planned for launch in this decade. We have restricted our review to instruments that primarily observe terrestrial landscapes or coastal margins and are available under free and open data policies. We focused on imagers that passively measure wavelengths in the reflected solar and emitted thermal spectrum. The suite of instruments we describe measure land surface characteristics, including land cover, but provide a more detailed monitoring of ecosystems, plant communities, and even some species then possible from historic sensors. The newer instruments have potential to greatly improve our understanding of ecosystem functional relationships among plant traits like leaf mass area (LMA), total nitrogen content, and leaf area index (LAI). They provide new information on physiological processes related to photosynthesis, transpiration and respiration, and stress detection, including capabilities to measure key plant and soil biophysical properties. These include canopy and soil temperature and emissivity, chlorophyll fluorescence, and biogeochemical contents like photosynthetic pigments (e.g., chlorophylls, carotenoids, and phycobiliproteins from cyanobacteria), water, cellulose, lignin, and nitrogen in foliar proteins. These data will enable us to quantify and characterize various soil properties such as iron content, several types of soil clays, organic matter, and other components. Most of these satellites are in low Earth orbit (LEO), but we include a few in geostationary orbit (GEO) because of their potential to measure plant physiological traits over diurnal periods, improving estimates of water and carbon budgets. We also include a few spaceborne active LiDAR and radar imagers designed for quantifying surface topography, changes in surface structure, and 3-dimensional canopy properties such as height, area, vertical profiles, and gap structure. We provide a description of each instrument and tables to summarize their characteristics. Lastly, we suggest instrument synergies that are likely to yield improved results when data are combined. Background Many environmental scientists have concluded that the Earth is at or near one or more perilous climate tipping points (Krieger et al. 2009; Lenton, 2011, Lenton and Williams 2013; Brook et al. 2013; Hickman et al., 2019). Climate change interacts with and exacerbates many other environmental and societal problems. These include air and water pollution that compound health issues (Harlan and Ruddell 2011; Kan et al. 2012), especially in poor communities (Schlosberg and Colins 2014; Hallegatte and Rozenberg 2017), widespread and/or frequent droughts linked to extensive fires (Amiro et al. 2001; Littell et al. 2016), diminished resources for drinking water and irrigation (Jackson et al. 2001; Oki and Kanae 2006), and large-scale biodiversity losses (Lindenmayer and Likens 2011; Pires et al. 2018) , including species extinctions (Cahill et al. 2013). Related factors include deforestation (Green and Sussman 1990) and soil erosion (Hill et al., 2009, consequences of over-exploitation of resources (Giri et al. 2007) due to massive global conversion of natural resources for human uses (Seto et al. 2002. Documentation of all of these problems and many others are of interest to the broader ecological community at scales from local to global. This can only realistically be accomplished with satellite observations in combination with process and statistical models to reveal patterns and trends that enlighten understanding about how current conditions have developed from past environmental drivers in order to predict future conditions.

#### Warming causes extinction

David **Spratt 19**, Research Director for Breakthrough National Centre for Climate Restoration, Ian Dunlop, member of the Club of Rome, formerly an international oil, gas and coal industry executive, chairman of the Australian Coal Association, May 2019, “Existential climate-related security risk: A scenario approach,” https://docs.wixstatic.com/ugd/148cb0\_b2c0c79dc4344b279bcf2365336ff23b.pdf

An existential risk to civilisation is one posing **permanent large negative consequences** to humanity which may never be undone, either **annihilating intelligent life** or permanently and drastically curtailing its potential.

With the commitments by nations to the 2015 **Paris** Agreement, the current path of warming is 3°C or more by 2100. But this figure does not include “long-term” **carbon-cycle feedbacks**, which are materially relevant now and in the near future due to the **unprecedented** **rate** at which human activity is perturbing the climate system. Taking these into account, the Paris path would lead to around 5°C of warming by 2100.

Scientists warn that warming of 4°C is incompatible with an organised global community, is **devastating** to the **majority of** **ecosystems**, and has a **high probability** of not being stable. The World Bank says it may be “**beyond adaptation**”. But an existential threat may also exist for many peoples and regions at a significantly lower level of warming. In 2017, 3°C of warming was categorised as “catastrophic” with a warning that, on a path of unchecked emissions, low-probability, high-impact warming could be catastrophic by 2050.

The Emeritus Director of the Potsdam Institute, Prof. Hans Joachim Schellnhuber, warns that “climate change is now reaching the **end-game**, where very soon humanity must choose between **taking** **unprecedented action**, or accepting that it has been left too late and **bear** **the consequences**.” He says that if we continue down the present path “there is a very big risk that we will just **end** **our** **civilisation**. The human species will survive somehow but we will destroy almost everything we have built up over the last two thousand years.”11

Unfortunately, conventional risk and probability analysis becomes useless in these circumstances because it excludes the full implications of outlier events and possibilities lurking at the fringes.12

Prudent risk-management means a tough, objective look at the real risks to which we are exposed, especially at those **“fat-tail” events**, which may have consequences that are damaging beyond quantification, and **threaten** **the** **survival** **of human** **civilisation**.

Global warming projections display a “fat-tailed” distribution with a **greater likelihood** of warming that is well in **excess of** **the** **average amount** **of warming** **predicted by** **climate** **models**, and are of a higher probability than would be expected under typical statistical assumptions. More importantly, the risk lies disproportionately in the “fat-tail” outcomes, as illustrated in Figure 1.

### War

#### instability causes global war

**Mead 13** – (Walter Russell, Foreign Affairs Prof @ Bard, “Peace In The Congo? Why The World Should Care”, American Interest; http://www.the-american-interest.com/2013/12/15/peace-in-the-congo-why-the-world-should-care/)

The Congo war should be a reminder to us all that the foundations of our world are **dynamite**, and that the potential for **new conflicts** on the scale of the **horrific** **wars of the 20th century** is very much **with us** **today.** The second lesson from this conflict stems from the realization of how much patience and commitment from the international community (which in this case included the Atlantic democracies and a coalition of African states working as individual countries and through various international institutions) it has taken to get this far towards peace. Particularly at a time when many Americans want the US to turn inwards, there are people who make the argument that it is really none of America’s business to invest time and energy in the often thankless task of solving these conflicts. That might be an ugly but defensible position if we didn’t live in such a tinderbox world. Someone could rationally say, yes, it’s terrible that a million plus people are being killed overseas in a horrific conflict, but the war is really very far away and America has urgent needs at home and we should husband the resources we have available for foreign policy on things that have more power to affect us directly. The problem is that **these wars spread**. They may start in places that we don’t care much about (most Americans didn’t give a rat’s patootie about whether Germany controlled the Sudetenland in 1938 or Danzig in 1939) but they tend to **spread to places** that we do care **very much about**. This can be because a revisionist great power like Germany in 1938-39 needs to overturn the balance of power in Europe to achieve its goals, or it can be because instability in a **very remote place** triggers problems in places that we **care about** very much. Out of Afghanistan in 2001 came both 9/11 and the waves of insurgency and instability that threaten to rip nuclear-armed Pakistan apart or trigger wider conflict with India. Out of the mess in Syria a witches’ brew of terrorism and religious conflict looks set to complicate the security of our allies in Europe and the Middle East and even the security of the oil supply on which the world economy so profoundly depends. Africa, and the potential for upheaval there, is **of** **more** **importance** to American security than many people may **understand**. The line between **Africa and the Middle** **East is** a **soft** one. The weak states that straddle the **southern approaches** of the Sahara are **ideal petri dishes** for **A**l **Q**aeda **type groups** to form and attract local support. There are networks of funding and religious contact that give groups in these countries potential **access to funds**, **fighters**, **training** and **weapons** from the Middle East. A war in the eastern Congo might not directly trigger these other conflicts, but it helps to **create the swirling underworld** of **arms trading**, **money transfers**, **illegal commerce** and the rise of a generation of young men who become experienced fighters—and know no other way to make a living. It destabilizes the environment for neighboring states (like Uganda and Kenya) that play much more direct role in potential crises of greater concern to us. This is why the Clinton, Bush and Obama administrations (representing three very different kinds of American politics) have all been engaged in efforts like the peace keeping effort in the Congo. It is why, despite our budget problems at home and despite our often justifiable impatience with the complexities of dealing with international coalitions and the inadequacies of international institutions, we need to continue the slow and painstaking work that makes agreements like this one possible. The world we live in is an **explosive** one. There are **all kinds of things that can go horribly wrong**, and what happens in one corner of the world doesn’t necessarily stay there. Reducing the danger requires an active, global American foreign policy whether we like it or not. The potential for new communal and religious wars that kill millions of people and endanger American security and world peace is very real. The world seems safer than the world of the 1930s and 1940s in part because the United States and many of our friends and allies are working quietly around the world to contain outbreaks of violence, address the issues that exacerbate hatred and distrust, and in the last analysis are willing to provide the security guarantees and deterrents that prevent mass mayhem.

#### Independent African satellite constellation key to push out foreign, Chinese investment – which kills African democracy

Tuerk 20 Tuerk, Miriam. CEO and cofounder of Clear Blue Technologies Inc."Africa Is The Next Frontier For The Internet." Forbes, 8 June 2020, www.forbes.com/sites/miriamtuerk/2020/06/09/africa-is-the-next-frontier-for-the-internet/?sh=1f5e9eec4900.

Expanding network connectivity across sub-Saharan Africa will open up digital services that many of us now take for granted. Mobile Banking, Whatsapp Chatting and video, e-health, e-education are key services only possible with reliable internet connectivity. For a geographically disparate population, it will mean greater access to essential services, including e-agri services. There are hugely populous cities in sub-Saharan Africa – Lagos in Nigeria is one of the fastest growing cities in the world – but even in the center on Victoria Island, the internet connection can be patchy and face frequent outages. For those populations, access to the internet means being able to save, invest and borrow money, getting an education, having access to basic healthcare, and being able to trade with bigger markets; are all fundamental to socioeconomic advancement. That has been a powerful force fueling economic growth over the past century across Europe, North America and Asia. The Demand Is There There is a lot of pent-up demand for internet services in sub-Saharan Africa. Indeed, a substantial portion of mobile phones have internet and messaging capabilities. Mobile usage in sub-Saharan is more widespread than electricity – in 2016, The Economist found that while less than half the population has access to electricity, two-fifths own a mobile phone. In a Pew Research survey of six sub-Saharan Africa countries, a median of 41% used the internet occasionally or had access to an internet-capable smartphone – that compares to 89% of Americans. Digital innovations have also taken off quickly in sub-Saharan Africa, partly because the younger demographic is more ready for adoption of new technologies. Compared to aging populations in developed countries, the median age in Africa is 19.2 years old. In a study by Pew Research, it notes that adults younger than 30 in six sub-Saharan African countries are more likely to use the Internet, echoing trends seen elsewhere. We’ve seen this in the quick adoption of digital technologies. Safaricom, Kenya’s largest telecom operator, has seen widespread adoption of its mobile payment app, M-Pesa, since it was launched in 2007. The app now has 24.5 million users, representing over 70% of the mobile money market in Kenya, and can be used to send and receive funds via SMS without having a bank account. The Supply Is Growing, But Still Faces Bottlenecks There are a number of mobile carriers now seeking to expand network coverage in Africa, especially in rural areas. Governments are pushing for these infrastructure roll outs as they recognize that communications and renewable energy are two key tenets of development for their countries. Telecom technology over the past decade has advanced significantly, with specialized product development to address the needs of Rural telecom particularly in terms of the off-grid renewable energy, resilience to extreme temperatures, and software driven base stations meaning that masts can placed almost anywhere. The wider need for infrastructure development in telecom and renewable energy is well recognized. The African Development Bank (AfDB) estimates that the continent of Africa will need investment of at least US$130 billion to $170 billion annually. In recent years, the majority of that capital investment into African infrastructure has come from China – foreign direct investment from China has grown 40% annually over the past decade, and it could be even higher, dwarfing investment from other economic partners, including the U.S. ZAMBIA CHINA A pedestrian runs past a Huawei Technologies Co. mural painted on a wall in Lusaka, Zambia, on ... [+] © 2018 Bloomberg Finance LP Huawei, ZTE and China Telecom CHA 0.0% have all made in-roads into the region. Huawei recently announced that it was launching a 5G transport network with Rain in South Africa, the first network operator in the country to deploy 5G. Huawei’s growth in the region has raised concerns that it could be used for surveillance; The Wall Street Journal reported last year that technicians from the company helped African governments to spy on their political opponents. At the same time, Western companies such as Vanu and Parallel Wireless are developing innovative solutions and products. While growth in technology is overall a good thing for society, it cannot come at the cost of democracy. Western governments need to do more to invest in African telecoms to secure the future of this region and our economic relationships with it.

#### expansion in Africa escalates absent democratic relations

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Increasing tensions between China and the US will be detrimental to African prosperity and peace. Last week, the 12th US-Africa Business Summit, a high-level event attended by 11 African heads of state and government and some 1,000 business leaders, was held in Maputo, Mozambique. During the three-day event, US officials unveiled a $60bn investment agency which will seek to invest in low and middle-income countries, with a special focus on Africa. The announcement came six months after National Security Advisor John Bolton presented the Trump administration's "New Africa Strategy". According to the document: "Great power competitors, namely China and Russia, are rapidly expanding their financial and political influence across Africa. They are deliberately and aggressively targeting their investments in the region to gain a competitive advantage over the United States." Although both China and Russia are mentioned, over the past few months, the US has demonstrated that it is mainly concerned about the former. In fact, it already appears that Africa is set to become yet another battleground for the escalating trade war between Beijing and Washington. With increasing foreign military presence and growing diplomatic tensions, the continent is already witnessing the first signs of an emerging new cold war. And just like the previous one devastated Africa, fuelling wars and forcing African governments to make economic choices not in their best interests, this one will also be detrimental to African development and peace. Economic war China's approach to Africa has always been trade oriented. The continent became one of the top destinations for Chinese investment after Beijing introduced the so-called "Go Out" policy in 1999 which encouraged private and state-owned business to seek economic opportunities abroad. As a result, Chinese trade with Africa has increased 40-fold over the past two decades; in 2017, it stood at $140bn. Between 2003 and 2017, Chinese foreign direct investment (FDI) flows have also jumped more close to 60-fold to $4bn a year; FDI stocks stand at $43bn - a significant part of which has gone to infrastructure and energy projects. China has significantly expanded African railways, investing in various projects in Kenya, Ethiopia, Djibouti, Angola and Nigeria; it is currently building a massive hydropower plant in Angola and have built Africa's longest railway connecting Ethiopia and Djibouti; it has built the headquarters of the African Union in Addis Ababa and the West African regional bloc ECOWAS in Abuja. By contrast, for a long time the US has viewed Africa as a battlefield where it can confront its enemies, whether the Soviets during the Cold War, terrorists after 9/11 or now the Chinese. Washington has never really made a concerted effort to develop its economic relations with the continent. As a result, trade between the US and Africa has decreased from $120bn in 2012 to just over $50bn today. US FDI flows have also slumped from $9.4bn in 2009 to around $330m in 2017. The new $60bn investment fund announced last week is a welcome initiative from the US but it will not be able to challenge Chinese economic presence on the continent. Just last year Chinese President Xi Jinping pledged $60bn too but dedicated it solely to investment in Africa. The US has repeatedly accused China of using "debt to hold states in Africa captive to [its] wishes and demands" and has warned African states to avoid Chinese "debt diplomacy" which is supposedly incompatible with the independence of African nations and civil society and poses "a significant threat to US national security interests". Yet, Africa is only the fourth-biggest recipient of Chinese FDI after Europe (mainly Germany, UK and Netherlands), the Americas (mainly the US and Canada), and Asia. The US has also borrowed heavily from China; currently its debt to its rival stands at $1.12 trillion. By contrast, Africa owes China around $83bn. Africans are fully aware of and concerned about high indebtedness, trade imbalances, the relatively poor quality of Chinese goods and services and Beijing's application of lower standards of labour and environmental practices. But many do not share the American perspective that their economic relationship with China is to their detriment and rather see it as an opportunity that provides much-needed unconditional funding and that takes into account local priorities. As Djibouti's President Ismail Omar Guelleh has pointed out, "The reality is that no one but the Chinese offers a long-term partnership." The pressure the US is currently exerting on African countries to move away from partnerships with China could hurt African economies. It could force African countries into making choices that are not in their best economic interests and miss out on important development projects or funding. Meanwhile, the US-China trade war is already affecting the continent. According to the African Development Bank, it could cause as much as a 2.5 percent decrease in GDP for resource-intensive African economies and a 1.9 percent dip for oil-exporting countries. Militarisation The escalating tensions between the US and China could also end up threatening the security of the continent**.** Both countries are militarily involved in Africa. Over the past 15 years, the Chinese People's Liberation Army has been engaged in a number of security missions across the continent, making modest auxiliary troop contributions to peacekeeping operations in Sudan, South Sudan, Liberia, Mali and the Democratic Republic of Congo. It has also contributed millions of dollars of peacekeeping equipment to the African Union Mission in Somalia and provided significant funding to the Intergovernmental Authority on Development for its mediation in South Sudan. In 2017, the first Chinese overseas military base was opened in Djibouti. The facility, which currently hosts some 400 staff and troops, and has the capacity to accommodate 10,000, is officially supposed to provide support for the ongoing anti-piracy operations of the Chinese navy, but it also plays a role in securing maritime routes, part of the Belt and Road Initiative. There has also been speculation that this is the first of a number of planned bases meant to secure Chinese interests in Africa. China's military presence in Africa, however, pales in comparison to that of the US. Over the past few years, US Africa Command has run some 36 different military operations in 13 African countries, including Burkina Faso, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Kenya, Libya, Mali, Mauritania, Niger, Somalia, South Sudan and Tunisia. It has more than 7,000 troops deployed on the continent. It has a large base in Djibouti - the biggest and only permanent US military base in Africa - but it also runs at least 34 other military outposts scattered across the west, east and north of the continent where US troops are deployed and military operations (including drone attacks) are launched from. The US also directly supports the armies of Egypt, Nigeria, Ethiopia, Mali, Niger and others as well as the G5 Sahel force tasked with counterterrorism. While a direct confrontation between US and Chinese forces in Africa is unlikely, their growing presence is becoming an increasingly destabilising factor. Already Washington's strategy to contain Chinese influence over Africa is playing out at different conflict and social upheaval hotspots across the continent. The fallout of the US-Chinese competition is particularly apparent in the strategic Red Sea region, through which passes one of the most important maritime routes. Countries in the region are not only feeling growing US and Chinese pressure to take one side or the other, but are also increasingly exposed to outside interference by various regional powers. Growing regional tensions Djibouti has recently found itself at the centre of US-Chinese diplomatic confrontation. Being a host to military bases of both superpowers, the small country has had to play a difficult balancing game. In 2018, Djibouti seized control of its Doraleh Container Terminal from the Emirati company DP World, claiming its operation of the facility was threatening its sovereignty. The Djibouti authorities had feared that the UAE's investment in the nearby Port of Berbera in the autonomous Somali region of Somaliland could challenge its position as the main maritime hub for Ethiopia's large economy. Its decision to terminate the contract with DP World, however, triggered a sharp reaction from Washington, a close Emirati ally. The Trump administration fears that Djibouti could hand over control of the terminal to China. Bolton has warned: "Should this occur, the balance of power in the Horn of Africa - astride major arteries of maritime trade between Europe, the Middle East, and South Asia - would shift in favour of China. And, our US military personnel at Camp Lemonnier could face even further challenges in their efforts to protect the American people." Djibouti was forced to declare publicly that it would not allow China to take over the terminal but that has not assuaged US fears. Ever since, the US sought to secure a possible alternative location for its African military base: neighbouring Eritrea. It encouraged regional actors, including Saudi Arabia and the UAE, to pull Eritrea out of its decades-long isolation. In a matter of months, long-time enemies Ethiopia and Eritrea concluded a peace agreement to end their 20-year-old cold conflict, while the UN lifted sanctions on Asmara. As a result, Eritrea could emerge as a strategic rival to Djibouti, offering its coast for foreign military and economic facilities. The UAE, for example, has already set up a military base near the port of Assab. Sudan, to the north, has also been the battleground of the ongoing superpower turf war. China had been a long-term supporter of President Omar al-Bashir. Under his rule, Beijing came to dominate its oil industry, buying some 80 percent of its oil and thus providing Khartoum with much-needed cash to wage war against various rebel groups. It was also one of the few countries, along with Russia, that would break the UN arms embargo and sell weapons to al-Bashir's regime. After South Sudan gained independence in 2011, China continued to be a close partner of the Sudanese regime, remaining its main trading partner. Sudan in fact became the biggest beneficiary of the $60bn Africa investment package China pledged in 2018, having some $10bn in Chinese debt written off. The Chinese government also made a lot of plans to develop facilities in Port Sudan, where it already operates an oil terminal. Qatar and Turkey also signed deals with al-Bashir for various facilities in the port city. When mass protests erupted in December last year, Beijing stood by al-Bashir, who it saw as the main guarantor of stability in the country, which falls on strategic routes, part of its Belt and Road Initiative. Meanwhile, the US had repeatedly demonstrated that it did not want al-Bashir running for another term. His removal was approved in Washington, which has since appeared to back the interests of Saudi Arabia and the UAE in the country. The two Gulf states currently hope to install another strongman sympathetic to their regional politics, who would maintain Sudan's participation in the war in Yemen and curb Turkish and Qatari influence. At this point, it seems China is at risk of being sidelined by the significant sway the UAE and Saudi Arabia have with Sudan's Transitional Military Council (TMC). Apart from Djibouti and Sudan, various other countries in the region have felt the consequences of the US bid to contain China. This political confrontation has also added to the already rising tensions between other players in the region, including Egypt, Gulf countries, Iran and Turkey. The Trump administration has particularly favoured Emirati, Saudi and Egyptian interests which have emboldened these three countries in their efforts to shape regional dynamics to their advantage. Thus, in the long-term, given the pre-existing faultlines and conflicts in the region, the US-China cold war could have a detrimental effect, not only on its economy but also on its security. At this point, to preserve its interests and its peace, Africa has only one option: to reject pressures to swear allegiance to either of the two powers. African countries should uphold their sovereignty in policy and decision-making and pursue the course that is in the best interests of their nations. If the US wants to compete with China on the continent, it should do so in good faith. It can gain a competitive advantage by offering African countries better, more credible and principled alternatives to those put forward by China. But that can only happen if the US develops a strategy that focuses on Africa itself, not on containing and undermining the business of a third party.

## ILAW

#### The plan requires clarifying international space law---causes strategic bargaining to extract concessions

Alexander William **Salter 16**, Assistant Professor of Economics, Rawls College of Business, Texas Tech University, "SPACE DEBRIS: A LAW AND ECONOMICS ANALYSIS OF THE ORBITAL COMMONS", 19 STAN. TECH. L. REV. 221 (2016), https://law.stanford.edu/wp-content/uploads/2017/11/19-2-2-salter-final\_0.pdf

V. MITIGATION VS. REMOVAL Relying on international law to create an environment conducive to space debris removal initially seems promising. The Virginia school of political economy has convincingly shown the importance of political-legal institutions in creating the incentives that determine whether those who act within those institutions behave cooperatively or predatorily.47 In the context of space debris, the role of nation-states, or their space agencies, would be to create an international legal framework that clearly specifies the rules that will govern space debris removal and the interactions in space more generally. The certainty afforded by clear and nondiscriminatory48 rules would enable the parties of the space debris “social contract” to use efficient strategies for coping with space debris. However, this ideal result is, in practice, far from certain. To borrow a concept from Buchanan and Tullock’s framework,49 the costs of amending the rules in the case of international space law are exceptionally high. Although a social contract is beneficial in that it prevents stronger nation-states from imposing their will on weaker nation-states, it also creates incentives for the main spacefaring nations to block reforms that are overall welfare-enhancing but that do not sufficiently or directly benefit the stronger nations. The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (more commonly known as the Outer Space Treaty) is the foundation for current international space law.50 All major spacefaring nations are signatories. Article VIII of this treaty is the largest legal barrier to space debris removal efforts. This article stipulates that parties to the treaty retain jurisdiction over objects they launch into space, whether in orbit or on a celestial body such as the Moon. This article means that American organizations, whether private firms or the government, cannot remove pieces of Chinese or Russian debris without the permission of their respective governments. Perhaps contrary to intuition, consent will probably not be easy to secure. A major difficulty lies in the realization that much debris is valuable scrap material that is already in orbit. A significant fraction of the costs associated with putting spacecraft in orbit comes from escaping Earth’s gravity well. The presence of valuable material already in space can justifiably be claimed as a valuable resource for repairs to current spacecraft and eventual manufacturing in space. As an example, approximately 1,000 tons of aluminum orbit as debris from the upper stages of launch vehicles alone. Launching those materials into orbit could cost between $5 billion and $10 billion and would take several years.51 Another difficulty lies in the fact that no definition of space debris is currently accepted internationally. This could prove problematic for removal efforts, if there is disagreement as to whether a given object is useless space junk, or a potentially useful space asset. Although this ambiguity may appear purely semantic, resolving it does pose some legal difficulties. Doing so would require consensus among the spacefaring nations. The negotiation process for obtaining consent would be costly. Less obvious, but still important, is the 1972 Convention on International Liability for Damage Caused by Space Objects, normally referred to as the Liability Convention. The Liability Convention expanded on the issue of liability in Article VII of the Outer Space Treaty. Under the Liability Convention, any government “shall be absolutely liable to pay compensation for damage caused by its space objects on the surface of the Earth or to aircraft, and liable for damage due to its faults in space.”52 In other words, if a US party attempts to remove debris and accidentally damages another nation’s space objects, the US government would be liable for damages. More generally, because launching states would bear costs associated with accidents during debris removal, those states may be unwilling to participate in or permit such efforts. In theory, insurance can partly remediate the costs, but that remediation would still make debris removal engagement less appealing. A global effort to remediate debris would, by necessity, involve the three major spacefaring nations: the United States, Russia, and China.53 However, any effort would also require—at a minimum—a significant clarification and—at most —a complete overhaul of existing space law.54 One cannot assume that parties to the necessary political bargains would limit parleying to space-related issues. Agreements between sovereign nation-states must be self-enforcing.55 To secure consent, various parties to the change in the international legal-institutional framework may bargain strategically and may hold out for unrelated concessions as a way of maximizing private surplus. The costs, especially the decision-making costs, of changing the legal framework to secure a global response to a global commons problem are potentially quite high.

#### The PPWT prohibits space-based missile defense

Jack M. **Beard 16**, Associate Professor of Law at the University of Nebraska College of Law, Feb 15 2016, "Soft Law ’s Failure on the Horizon: The International Code of Conduct for Outer Space Activities", University of Pennsylvania Journal of International Law, Vol. 38, No. 2, 2016, https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1086&context=spacelaw

B. Avoid Arms Control Traps in Space Any successful effort to achieve legally binding restrictions on military activities or weapons in space must focus on specific, definable, and limited objectives or run afoul of issues that have historically ensured deadlock among suspicious and insecure adversaries.306 Some seemingly desirable goals, however, are likely to ensure failure. The first such problematic goal involves attempting to use arms control agreements or other instruments to comprehensively ensure peace in space. Unfortunately, the integration of modern military systems on earth, sea, air and space guarantees that at some point states seeking to disrupt or deny the ability of an adversary (such as the United States) to project power will find space capabilities to be a particularly appealing target, especially in the early stages of a crisis or conflict.307 The presence of so many things of military value in space thus makes actions by an adversary to neutralize, disrupt or destroy these things likely during a major conflict on earth.308 The second problematic arms control goal in space that seems certain to ensure stalemate involves attempting to define and prohibit military technologies with a view to broadly prevent the weaponization of space. Clearly defining a space weapon for purposes of any legally binding arms control agreement is a daunting task, one which is made particularly challenging by the “essentially military nature of space technology.”309 As noted, space technologies are routinely viewed as dual-use in nature, meaning that they can be readily employed for both civilian and military uses. Determining the ultimate purpose of many space technologies may thus depend on discerning the intentions of states, a process perhaps better suited for psychological than legal evaluation. 310 Further complicating the classification of space military technologies is the inherent difficulty in distinguishing most space weapons on the basis of their offensive and defensive roles or even their specific missions.311 For example, this problem lies at the heart of debates over the status and future of ballistic missile defense (BMD) programs, since the technology underlying BMD systems and offensive ASAT weapons is often indistinguishable.312 Vague and broad soft law instruments do not resolve this problem, but create instead their own confusion and insecurity. Vague and broad provisions in legally binding agreements that do not or cannot distinguish between these missions are similarly problematic. These issues, particularly difficulties in distinguishing ASAT and BMD systems, have figured prominently in complicating negotiations on space weapons over previous decades.313 Similarly, these concerns were a significant factor in initial U.S. opposition to the arms control measure proposed by China and Russia (the PPWT) since it prohibits states from placing any type of weapon in outer space (regardless of its military mission), thus effectively prohibiting the deployment of ballistic missile defense systems. 314 Furthermore, even if clear legal restrictions could be developed, verifying compliance with respect to technology in orbit around Earth would be very difficult (a point conceded even by China with respect to its own proposed PPWT).315

#### Causes rogue state missile threats---that escalates

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U.S. Homeland Missile Defense will Stay Ahead of Rogue States’ Missile Threats Technology trends point to the possibility of increasing rogue state missile threats to the U.S. homeland. Vulnerability to rogue state missile threats would endanger the American people and infrastructure, undermine the U.S. diplomatic position of strength, and could lead potential adversaries to mistakenly perceive the United States as susceptible to coercive escalation threats intended to preclude U.S. resolve to resist aggression abroad. Such misperceptions risk undermining our deterrence posture and messaging, and could lead adversaries to dangerous miscalculations regarding our commitment and resolve. It is therefore imperative that U.S. missile defense capabilities provide effective protection against rogue state missile threats to the homeland now and into the future. The United States is technically capable of doing so and has adopted an active missile defense force-sizing measure for protection of the homeland. DoD will develop, acquire, and maintain the U.S. homeland missile defense capabilities necessary to effectively protect against possible missile attacks on the homeland posed by the long-range missile arsenals of rogue states, defined today as North Korea and Iran, and to support the other missile defense roles identified in this MDR. This force-sizing measure for active U.S. missile defense is fully consistent with the 2018 NPR, and in order to keep pace with the threat, DoD will utilize existing defense systems and an increasing mix of advanced technologies, such as kinetic or directed-energy boost-phase defenses, and other advanced systems. It is technically challenging but feasible over time, affordable, and a strategic imperative. It will require the examination and possible fielding of advanced technologies to provide greater efficiencies for U.S. active missile defense capabilities, including space-based sensors and boost-phase defense capabilities. Further, because the related requirements will evolve as the long-range threat posed by rogue states evolves, it does not allow a static U.S. homeland defense architecture. Rather, it calls for a missile defense architecture that can adapt to emerging and unanticipated threats, including by adding capacity and the capability to surge missile defense as necessary in times of crisis or conflict. In coming years, rogue state missile threats to the U.S. homeland will likely expand in numbers and complexity. There are and will remain inherent uncertainties regarding the potential pace and scope of that expansion. Consequently, the United States will not accept any limitation or constraint on the development or deployment of missile defense capabilities needed to protect the homeland against rogue missile threats. Accepting limits now could constrain or preclude missile defense technologies and options necessary in the future to effectively protect the American people. As U.S. active defenses for the homeland continue to improve to stay ahead of rogue states’ missile threats, they could also provide a measure of protection against accidental or unauthorized missile launches. This defensive capability could be significant in the event of destabilizing domestic developments in any potential adversary armed with strategic weapons, and as long-range missile capabilities proliferate in coming years. U.S. missile defense capabilities will be sized to provide continuing effective protection of the U.S. homeland against rogue states’ offensive missile threats. The United States relies on nuclear deterrence to address the large and more sophisticated Russian and Chinese intercontinental ballistic missile capabilities, as well as to deter attacks from any source consistent with long-standing U.S. declaratory policy as re-affirmed in the 2018 NPR.

## Space Col

#### Space col coming now

Christiana **Reedy**, 8/17/**17**, "When Will the First Human Space Colony Be Established?," Futurism, <https://futurism.com/when-will-the-first-human-space-colony-be-established> //SR

Will humanity be ready to colonize space before doomsday? We asked Futurism readers when they thought humans will colonize off-planet, and the results revealed quite a consensus. More than 70 percent of people who took the poll thought a colony will be established during the first half of the 21st century, and the decade with the most votes — a whopping 36 percent of participants — was the 2030s. Satish Varma, a software engineer, explained why he voted for this decade. Varma wrote in his response that our technological advances in spacecraft design, artificial intelligence (AI), and bionics will be the driving forces that finally propel us into space long term. “Currently there are some promising advances in space exploration and artificial intelligence by companies like SpaceX, Google, and Tesla in a short time frame,” Varma wrote. Varma’s observations are right on — both SpaceX and Blue Origin have recently reached significant milestones in developing reusable rockets, which will be key in making space travel economically viable. Google has recently developed an AI that can learn almost as fast as we can, making the technology much more promising for real-world applications, like flying spaceships. What The Experts Have to Say The technologies have enticed governments and companies around the world to take the idea of space colonization seriously. The two most popular targets for human occupation are currently Mars and the Moon. The Moon gets a little less attention these days, but scientists have estimated that we could build a colony there over the pan of six years and for as little as $10 billion. The Chinese and European space agencies are carefully examining the possibility of a Moon base, as such a resource would greatly reduce the cost of traveling to other planets — including Mars. On the Mars front, the United Arab Emirates (UAE) has announced its intention to establish a settlement on the Red Planet by 2117. Other nations are likely to beat the UAE in reaching this goal, however, as the U.S. government has tasked NASA with getting humans on Mars by 2033, and China has set an even more ambitions goal: by the end of the decade. These government efforts align with readers’ predictions. But SpaceX CEO Elon Musk hopes to prove just how much more efficient private companies are than government bureaucracies. His plan, too, is to send humans to Mars by 2020, but that isn’t his only goal. He wants to make travel to the Red Planet affordable, setting the price cap at $200,000 in his new plan that focuses on establishing a self-sustaining space civilization rather than a simple exploratory expedition. Such an establishment will be paramount to the future of the human species, Musk said.

#### Solves every impact

Ben **Austen 11**, citing the Lifeboat Foundation and the Alliance to Rescue Civilization, contributing editor of Harper’s Magazine, “After Earth: Why, Where, How, and When We Might Leave Our Home Planet,” 3/16/11, http://www.popsci.com/science/article/2011-02/after-earth-why-where-how-and-when-we-might-leave-our-home-planet

Earth won’t always be fit for occupation. We know that in two billion years or so, an expanding sun will boil away our oceans, leav[e]ing our home in the universe uninhabitable—unless, that is, we haven’t already been wiped out by the Andromeda galaxy, which is on a multibillion-year collision course with our Milky Way. Moreover, at least a third of the thousand mile-wide asteroids that hurtle across our orbital path will eventually crash into us, at a rate of about one every 300,000 years. Why? Indeed, in 1989 a far smaller asteroid, the impact of which would still have been equivalent in force to 1,000 nuclear bombs, crossed our orbit just six hours after Earth had passed. A recent report by the Lifeboat Foundation, whose hundreds of researchers track a dozen different existential risks to humanity, likens that one-in-300,000 chance of a catastrophic strike to a game of Russian roulette: “If we keep pulling the trigger long enough we’ll blow our head off, and there’s no guarantee it won’t be the next pull.” Many of the threats that might lead us to consider off-Earth living arrangements are actually man-made, and not necessarily in the distant future. The amount we consume each year already far outstrips what our planet can sustain, and the World Wildlife Fund estimates that by 2030 we will be consuming two planets’ worth of natural resources annually. The Center for Research on the Epidemiology of Disasters, an international humanitarian organization, reports that the onslaught of droughts, earthquakes, epic rains and floods over the past decade is triple the number from the 1980s and nearly 54 times that of 1901, when this data was first collected. Some scenarios have climate change leading to severe water shortages, the submersion of coastal areas, and widespread famine. Additionally, the world could end by way of deadly pathogen, nuclear war or, as the Lifeboat Foundation warns, the “misuse of increasingly powerful technologies.” Given the risks humans pose to the planet, we might also someday leave Earth simply to conserve it, with our planet becoming a kind of nature sanctuary that we visit now and again, as we might Yosemite. None of the threats we face are especially far-fetched. Climate change is already a major factor in human affairs, for instance, and our planet has undergone at least one previous mass extinction as a result of asteroid impact. “The dinosaurs died out because they were too stupid to build an adequate spacefaring civilization,” says Tihamer Toth-Fejel, a research engineer at the Advanced Information Systems division of defense contractor General Dynamics and one of 85 members of the Lifeboat Foundation’s space-settlement board. “So far, the difference between us and them is barely measurable.” The Alliance to Rescue Civilization, a project started by New York University chemist Robert Shapiro, contends that the inevitability of any of several cataclysmic events means that we must prepare a copy of our civilization and move it into outer space and out of harm’s way—a backup of our cultural achievements and traditions. In 2005, then–NASA administrator Michael Griffin described the aims of the national space program in similar terms. “If we humans want to survive for hundreds of thousands or millions of years, we must ultimately populate other planets,” he said. “One day, I don’t know when that day is, but there will be more human beings who live off the Earth than on it.

#### Reject arg’s for why these don’t impede on the public end so the aff doesn’t include them

#### 1–Super shifty and proves that it’s impossible to interpret what is good under the PTD–your own card proves exemptions lead to self serving rationalizations

#### 2–Colonization is inconsistent with a commons because it claims property over land exclusively–not for public use

#### 3–Means you only defend some forms of appropriation are bad–specifying certain types is a voter for limits cuz you can specify infinite combinations

## Brazil

#### Brazil’s commercial space industry is flourishing.

**Nakahodo 21** [Sidney Nakao Nakahodo, Sidney Nakao Nakahodo is a Lecturer at Columbia University where he specializes in Political, Social, and Economic Development in Brazil. In parallel to his academic responsibilities he is currently involved in a number of technology startups, both as co-founder and advisor. Previously he was based in Washington DC and worked in private sector development and low carbon projects at the World Bank. Prior to joining the Bank he served as senior researcher for a major think tank in Brazil and consulted for the United Nations Development Programme. Sidney holds a Master of International Affairs from Columbia University's School of International and Public Affairs and a Bachelor of Materials Science and Engineering from the University of Sao Paulo (Brazil). He is also a graduate of the Advanced Studies Program in International Economic Policy at the Kiel Institute for the World Economy (Germany). 03-19-2021, "Should Space Be Part of a Development Strategy? Reflections Based Upon the Brazilian Experience," New Space, [http://doi.org/10.1089/space.2021.0002 accessed 12/14/21](https://www.liebertpub.com/doi/full/10.1089/space.2021.0002%20accessed%2012/14/21)] Adam

Lately, there has been a surge of interest in commercial space in Brazil due to institutional development, private sector engagement, and entrepreneurial activities. A Committee of Development of the Brazilian Space Program (CDPEB) was established in 2018 and comprises representatives of several Ministries. The CDPEB has the mandate to advise the President on the implementation of the Brazilian Space Program. Among its primary responsibilities is the elaboration of the General Law of Space, which is expected to provide the guidelines for commercial space activities.[13](https://www.liebertpub.com/doi/full/10.1089/space.2021.0002#B13) In May 2020, Brazilian Space Agency (AEB) issued a public call inviting local and foreign companies to use its civilian launch facilities.[14](https://www.liebertpub.com/doi/full/10.1089/space.2021.0002#B14) The private sector has been actively promoting commercial space. An industrial cluster now constitutes a “Space Valley” around the Sao Jose dos Campos Technology Park (PqTec), with spin-off companies impacting both space and nonspace sectors. The Aerospace Industries Association of Brazil (AIAB) is a trade organization of traditional space companies and defense contractors such as Avibras, Akaer (Opto), Atech, Fibraforte, Orbital, and SIATT. According to its website, AIAB has 30 members working in small satellites, satellite structures, payloads, satellite equipment, ground systems, propulsion, sounding rockets, and launchers.[15](https://www.liebertpub.com/doi/full/10.1089/space.2021.0002#B15) Braskem, the world's leading biopolymer producer, has partnered with Silicon Valley-born startup Made in Space to produce recyclable plastic objects in the ISS.[16](https://www.liebertpub.com/doi/full/10.1089/space.2021.0002#B16) Since 2017, AEB has organized the Brazilian Space Industry Forum, an annual event that congregates stakeholders, fosters the exchange of ideas, and promotes collaboration between domestic and international participants. The U.S.-Brazil CEO Forum, which brings together 12 U.S. and 12 Brazilian CEOs to develop joint recommendations for both governments on how to increase bilateral trade, proposed the development of a framework for joint space research programs in 2019. A small but vibrant New Space startup community is rapidly forming. The Alliance of Brazilian Space Startups was launched in 2020. Although some companies target low earth orbit and beyond, others are creating solutions to our planet using space technologies. PION has commercial products focusing on space and education. CRON and EMSIS have developed software and hardware for CubeSat missions, whereas Alya Nanosatellites aims to launch a constellation and tap into the earth's observation market. DeltaV, a spin-off from INPE, specializes in propulsion systems. ACRUX and VSAT are working on small satellite launchers. Airvantis sent multiple educational experiments to the ISS and has partnerships with companies and space agencies worldwide. The startup is carrying out Brazil's first lunar mission.[17](https://www.liebertpub.com/doi/full/10.1089/space.2021.0002#B17) In parallel, Agrosmart, Solinftec, and Strider are harnessing the power of space assets to provide remote sensing, weather forecast, and image processing services to the agricultural sector.[18](https://www.liebertpub.com/doi/full/10.1089/space.2021.0002#B18) Data companies such as Storm have incorporated open source algorithms developed by NASA for security applications.[19](https://www.liebertpub.com/doi/full/10.1089/space.2021.0002#B19)

#### Strong space sector cements Brazilian prestige and international influence

Dr. Robert C. **Harding 17**, Professor of Political Science at Valdosta State University, PhD in Political Science from the University of Miami, MA from the University of Louisville, Space Policy in Developing Countries: The Search for Security and Development on the Final Frontier, Paperback Edition, p. 1-4

Change in the post-Cold War period has become the standard of our time. Whether it be the changing power structure of the international system, climate change, the speed of technological innovation, or changes within our societies, the current international situation is one of constant, accelerating transformation. One area that has certainly evolved is the importance and priority given to space-related programs by a growing number of countries around the world. As the various captains of Star Trek fame have somberly declared, space really is the final frontier. But while it has been the basis for engaging science fiction, outer space nonetheless has a very down-to-Earth feature—it has become the ultimate venue for the growth of national power and socioeconomic development among a number of the world’s emergent states. This new paradigm of international relations has been evolving for over 50 years. From the Soviet Union’s launch of Sputnik in 1957, many states began to include space-based security concerns in their foreign policies, which forced them to consider what the then-new operations in space meant for national security; they also began to integrate space-based assets into their approaches to a wide range of national development challenges, from agriculture to health improvement to the development of natural resources. Though the importance of space to national power, prestige, and potential has been less obvious in the intervening years since the heady days of the Cold War’s space race, its significance has never waned and continues to increase as many states increase national space budgets. Space has, in fact, earned a permanent place at the table in matters of international conflict, peace, national and international development, and international law. Space was at one time the sole domain of the wealthiest developed countries. The United States and the Soviet Union/Russia, and to some extent the European Union, dominated the use of space and the associated technology in the first decades after World War II. But the last couple of decades of the twentieth century and the first decade of the twenty-first witnessed an increase in the number of countries with state-supported space programs. At this writing, no fewer than 25 developing states, including the rapidly emerging economic powers of Brazil (the sixth largest), China (second largest), and India (fourth largest), possess active national space programs with proven independent launch capability or concrete plans to achieve it soon. Space programs and their related technologies are now an integral part of the strategic and developmental policies of many relatively wealthy developing states that aspire to elevate their international status, security, and economic future. A multitude of other developing states as diverse as Mexico, Nigeria, and Malaysia have established and elevated their own space policy through the creation of national space agencies and the purchase and/or production of satellites and related space technology either through state, private, or joint efforts. For these smaller and rising middle powers, the acquisition of space capabilities is now an integral component of their national policies. Though commercial enterprise is not a focus of this study, it must be noted that as the cost of space-related technology has decreased dramatically, the expanding number of national state actors in space has been paced by the equally impressive expansion in the number of strictly commercial space companies. Communications, geospatial information, and a wide variety of other services provided by commercial satellites affect much of modern life, and also provide vital information to governments, their agencies, and business interests worldwide. This information covers many of the same areas that national governments find important to national well-being, such as weather and climate monitoring, water management, environmental observation, topographic mapping, natural disaster planning, and crop management. These services are provided commercially by a growing cadre of companies that build satellites, create the associated technologies, and are beginning to provide basic launch services, all areas that were previously the exclusive domain of state-owned space agencies. The growth of commercial space services has been a double-edged sword for states. By 2010, the global space industry was estimated to be worth US$276.52 billion, an 18 percent increase over 2009.2 Of this total, worldwide commercial satellite industry revenues rose 11 percent to US$160.9 billion in 2010.3 Despite sporadic attempts to control its proliferation, commercial satellite imagery has become so good and so broadly disseminated that many national governments, for example Israel, have complained that its existence endangers national security because potential terrorists now have access to the detailed satellite imagery necessary to plan precise attacks. Until the 1990s, such high-resolution satellite imagery was almost exclusively the domain of the militaries of developed space powers, which, for national security reasons, did not generally make their data public. And since there were a limited number of states with the capability to launch surveillance satellites, the potential sources were likewise limited. Those civilian satellites that did operate before the 1990s provided imagery of a much lower spatial resolution than their military counterparts, typically not showing clear images of objects smaller than 10 meters across. However, that situation changed with the launch of the US company Lockheed Martin’s Ikonos satellite in 1999. Its spatial resolution of one meter meant that for the first time, no country could depend on geographic distance and national borders to ensure state secrets. The situation became even more fluid through the 1990s and into the 2000s as the transfer of space technology—satellites and associated technology— became a commercially viable avenue for major satellite producers. Today, imagery services such as Google Earth have revolutionized access to satellite imagery in the same way that cell phones have changed communications access for hundreds of millions of people around the world—they have democratized it. Nonetheless, the growing actual importance of space policy stands in stark contrast to the popular perception of the significance of space in the modern world. Indeed, more than 50 years after the launch of Sputnik, the exploration of near space via the moon-landings, and various robotic missions to the solar system’s planets, surveys have shown that few people in the West still consider space as anything novel. The popular mindset has moved on to the wonders of the “information age” and the benefits (or detriments) of globalization. The generations of technology spawned by those earlier days of space exploration have been indispensable in the creation of our high-tech, instantaneous world, but space and its benefits are now so integrated into our daily infrastructure that most people do not give it a second thought. The reactions to the Challenger and Columbia space shuttle tragedies aside, public complacency toward the importance of space has become the rule, rather than the exception. Despite these popular sentiments, the recent expansion of space programs in the developing world demonstrates that national governments have never altered their view of the importance of space for achieving and expanding national power—militarily or socioeconomically. This expansion of space programs is especially noteworthy because it reflects an emergent democratization of space, which is one of the most important factors in the changing distribution of power in the current international arena. Many countries now use satellites for communications and obtaining weather data, through ownership or simply purchase of the data. In fact, this broadening and expansion of the usage of space and the attendant transformation of power distribution is seen by some observers as leading to a new space race, albeit one that has yet to gain the high profile that the previous contest had during the Cold War. This competition is emerging as the catalyst for a new generation of space-related policies and innovations in both established and emerging space-faring countries. Consider how one recent space-related event affected the dynamic of interstate relations. In January 2007, the news that China had successfully tested an anti-satellite ballistic missile sent shockwaves around the world’s foreign policy community. By shooting down one of its own aging satellites from low Earth orbit, China—a country that only a generation before was seen as poor by most measures—demonstrated its intent to join the existing space powers, thus attracting attention, if not commanding respect as a potential world power. China plans to land a nuclear-powered unmanned rover on the moon by 2013, and to have in place an orbital military space station later in the second decade of this century.4 But while China’s space policy is more ambitious and better funded than those of other developing states, it is by no means unique. The next year of this twenty-first century space race saw India following up on the Chinese success by launching its own successful probe to the moon. Around the world, increasing numbers of developing countries are investing in space-related technologies, seeking partners for space projects, and even constructing launch facilities that may one day rival the established space powers of the United States, Russia, the European Union, and more recently Japan. But what motivates a developing country, which by definition is relatively poor, to spend the comparatively large amounts of money required for these space adventures? The short answer is that, like the United States and the Soviet Union before them, developing countries pursue active space policies because of the recognition that space is, in many ways, the ultimate measure of national power, international prestige, and demonstrated national potential. Moreover, space-based assets allow states to more fully utilize their national resources and to expand the reach of domestic socioeconomic programs into areas as diverse as agriculture, education, medicine, and economic development. Thus a space program figures as an integral facet of any capable state’s national security and developmental policies. The benefits of a successful space program include advanced communications, a platform for technology improvement, greatly enhanced geographic information, and, for some, expanded defensive and intelligence capabilities. Equally important, space programs can provide the host state with increased international prestige, which accrues both domestic and international advantages. Hence, developing countries are merely being rational state actors and following the path pioneered by those space-faring states that preceded them.

#### It's key to project success AND overcome historical domination

Dr. Robert C. **Harding 17**, Professor of Political Science at Valdosta State University, PhD in Political Science from the University of Miami, MA from the University of Louisville, Space Policy in Developing Countries: The Search for Security and Development on the Final Frontier, Paperback Edition, p. 23

Space programs bestow equally important soft power, especially those that involve human space flight. Every major space power has spent considerable funds to achieve the ability to put humans in space for both tangible and intangible benefits. Logsdon (2007) has argued that human space flight ranks among the most intensely patriotic symbols of modern times.27 Some of the emerging space actors have pursued or are pursuing human space flight as a demonstration of their programs’ sophistication, and their astronauts are held up by their governments as national patriotic icons. As will be discussed in Chapter 3, for the largest EMSAs—Brazil, China, and India—their space programs have been touted not only as national accomplishments but as a national catharsis to overcome histories of direct and indirect domination by outside powers and to project to others a sense of greatness.

#### Brazilian leadership solves every threat

**Huck 20** [Luciano Huck, from the Law School of the University of São Paulo, Host of Rede Globo, Founder of Joá Investments 1/15/2020, "This country is vital to 'global survival'," World Economic Forum,<https://www.weforum.org/agenda/2020/01/what-happens-next-in-brazil-has-global-consequences-here-are-three-priorities-for-the-next-decade/> accessed 12/14/21] recut Adam

From spiralling geopolitical tensions in the Middle East to raging forest fires in Australia, 2020 certainly started with a bang. A shortlist of some of our biggest existential threats includes accelerating climate change, staggering inequalities and the failure of nation-states to cooperate to mitigate shared global risks. With all the bad news, it is hard to see the incredible possibilities on the horizon, not least advances in health, education and the boundless potential of new technologies. A growing number of businesses including huge asset managers like BlackRock are also becoming greener. All of these challenges and opportunities are apparent in Brazil, the world’s fourth-largest democracy and its ninth biggest economy. Brazil will play a leading role in how the next decade unfolds. A big reason for this is its immense natural resources - including over 40% of the world’s tropical forests and 20% of the planet's fresh-water supply. The Amazon is often described as the "lungs of the world" - for good reason. But the lungs are collapsing as a result of man-made fires and runaway deforestation. With more than 210 million citizens, Brazil also has an impressive stock of human resources. But it is also convulsed by breathtaking inequality and grinding poverty. Complicating matters, we are facing a crisis of political leadership and shirking our international responsibilities. What happens next in Brazil has far-reaching consequences for global survival. The decisions adopted by Latin America's largest country - whether in relation to protecting the Amazon, reducing inequality or strengthening multilateral cooperation - will help determine whether this is the world's best century or its last one. The sheer scope of the challenges facing Brazilians can feel overwhelming. Without a transformative vision and narrative, a renewal of political leadership, and tangible improvement, people feel rudderless and afraid. For the past 20 years, I've been taking the pulse of Brazil. I produce and present a popular television program reaching roughly 30 million Brazilians every week. Most of the time, I travel across the country listening to the inspiring and heartbreaking stories of my countrymen and women. They remind me every day why I need to contribute to building a better Brazil. So here are three challenges that I firmly believe Brazilians can turn into opportunities. Amazon 4.0 Dramatic fires and deforestation in the Amazon made global headlines in 2019. Despite the best efforts of the Brazilian authorities to conceal the problem, the Science Ministry's own satellite data showed that deforestation rates were at the highest levels in two decades. While falling out of the international news cycle, the destruction continues. If deforestation persists at current rates, irreversible die-off could convert the world’s largest tropical forests into its largest savannah. This would release up to 140 billion tons of stored carbon into the atmosphere, effectively scuppering efforts to meet the Paris Agreement targets. A radical new paradigm is needed to ensure the sustainable stewardship of Brazil's stunning cultural and biodiversity. It must harness the Amazon's most powerful resource - the 25 million people who live there. For one, there has to be zero tolerance for deforestation and a concerted focus on improving the productivity of areas where forests have already been cut down. Roughly 90% of deforestation in the Amazon is illegal and at least two-thirds of the 80 million hectares of cleared land are under-used, degraded and abandoned. Just as important as sustainable agri-business, the expansion of eco-tourism, investment in biotechnology research and the development of fairly-traded rainforest products. In a survey conducted in August of 2019, the majority of Brazilians thought that the Amazon rainforest was a reason for national pride. At that time, up to 68 percent of respondents in Brazil strongly agreed with the sentence Reducing inequality Deepening social and economic inequality within countries is fundamentally reconfiguring domestic and international politics. In some cases, governments are retreating from multilateral cooperation and reverting to reactionary nationalism and protectionism. These dynamics are apparent in Brazil, among the world’s most unequal countries. Although Brazil made important advances in reducing poverty since the 2000s, inequality remained stubbornly high. And in recent years, per capita income plunged and the gap between the rich and poor started rising, wiping out many social gains of the previous three decades. Today, the average monthly income of the wealthiest one per cent is more than 33 times the income of the poorest 50%. Inequality not only hinders economic growth, but it also fuels polarization and populism. Brazil needs to put inequality reduction at the top of the national agenda in 2020. A combination of common-sense interventions are required: ensuring the fairer collection of taxes, reducing subsidies for the wealthy, rolling-out more equal opportunity policies, and stimulating opportunities for the most vulnerable. Most important of all is dramatically improving the quality of basic public education, especially early childhood schooling. Brazil's education system is failing poorer families. Wealth inequality is reinforcing inequality of opportunity for the next generation. To win the war on inequality, Brazil needs an inclusive growth strategy, one that is not limited to growing income and smart deregulation but also ensures that quality public services delivering security, education, health, sanitation and transportation reach all citizens, not just those who pay a premium for them. Restoring leadership After years of corruption and stagnation, Brazil is suffering from sharp societal divisions and simmering tensions. In 2013, well before the street protests that flared up in Bolivia, Chile, Colombia and Ecuador, Brazil experienced the largest demonstrations since the restoration of democracy in 1985. The impeachment of President Dilma in 2016, the unprecedented unpopularity of the Temer administration and the election of far-right Jair Bolsonaro in 2018 revealed the extent of dissatisfaction with the status quo. Bolsonaro was partly elected because the credibility of Brazil's political establishment was demolished by ongoing “Car Wash” investigations into government corruption. Exhausted by scandal and stagnation, Brazilians voted for change. To tackle the big challenges of the next decade, Brazil needs to restore and renew its political leaders from the top to bottom. Accountable, responsible and representative leadership and public service are fundamental to revitalizing the social contract. This won't happen spontaneously. It requires a conscious effort to attract and invest in talent. it also demands that each and every Brazilian gets involved. In 2017, I joined Agora, one of several dynamic civic movements investing in a new generation of leaders committed to a more inclusive and sustainable Brazil. And in 2018, I co-founded RenovaBR, attracting over 4,600 submissions from people who'd never been involved in politics for training in governance and ethics. Of the 120 successful applicants, 17 were elected to federal office that year. Brazil is a country of infinite possibility. It has achieved breathtaking gains over the last generation - bringing tens of millions of people out of poverty. But these improvements were fragile. As we’ve seen in other parts of the world, when societies and living standards start moving backwards, social protest and unrest are not far behind. This is dangerous. Irresponsible leaders can take advantage of the fear and uncertainty that result. But we can also fight back. We will start rewriting the Brazilian story in 2020, first by acknowledging our most intractable problems and then by leveraging our tremendous creativity, scientific prowess and expertise. This means stepping out of our comfort zones. Powered by civic and social entrepreneurs from across the political spectrum, we can rebuild a positive vision for the future in Brazil.

## Innovation

#### Space commercialization drives tech innovation in the squo – it provides a unique impetus.

**Hampson 17** Joshua Hampson 1-25-2017 “The Future of Space Commercialization”<https://republicans-science.house.gov/sites/republicans.science.house.gov/files/documents/TheFutureofSpaceCommercializationFinal.pdf> (Security Studies Fellow at the Niskanen Center)//Elmer

The size of the space economy is far larger than many may think. In 2015 alone, the global market amounted to $323 billion. Commercial infrastructure and systems accounted for 76 percent of that 9 total, with satellite television the largest subsection at $95 billion. The global space launch market’s 10 11 share of that total came in at $6 billion dollars. It can be hard to disaggregate how space benefits 12 particular national economies, but in 2009 (the last available report), the Federal Aviation Administration (FAA) estimated that commercial space transportation and enabled industries generated $208.3 billion in economic activity in the United States alone. Space is not just about 13 satellite television and global transportation; while not commercial, GPS satellites also underpin personal navigation, such as smartphone GPS use, and timing data used for Internet coordination.14 Without that data, there could be problems for a range of Internet and cloud-based services.15 There is also room for growth. The FAA has noted that while the commercial launch sector has not grown dramatically in the last decade, there are indications that there is latent demand. This 16 demand may catalyze an increase in launches and growth of the wider space economy in the next decade. The Satellite Industry Association’s 2015 report highlighted that their section of the space economy outgrew both the American and global economies. The FAA anticipates that growth to 17 continue, with expectations that small payload launch will be a particular industry driver.18 In the future, emerging space industries may contribute even more the American economy. Space tourism and resource recovery—e.g., mining on planets, moons , and asteroids—in particular may become large parts of that industry. Of course, their viability rests on a range of factors, including costs, future regulation, international problems, and assumptions about technological development. However, there is increasing optimism in these areas of economic production. But the space economy is not just about what happens in orbit, or how that alters life on the ground. The growth of this economy can also contribute to new innovations across all walks of life. Technological Innovation Innovation is generally hard to predict; some new technologies seem to come out of nowhere and others only take off when paired with a new application. It is difficult to predict the future, but it is reasonable to expect that a growing space economy would open opportunities for technological and organizational innovation. In terms of technology, the difficult environment of outer space helps incentivize progress along the margins. Because each object launched into orbit costs a significant amount of money—at the moment between $27,000 and $43,000 per pound, though that will likely drop in the future —each 19 reduction in payload size saves money or means more can be launched. At the same time, the ability to fit more capability into a smaller satellite opens outer space to actors that previously were priced out of the market. This is one of the reasons why small, affordable satellites are increasingly pursued by companies or organizations that cannot afford to launch larger traditional satellites. These small 20 satellites also provide non-traditional launchers, such as engineering students or prototypers, the opportunity to learn about satellite production and test new technologies before working on a full-sized satellite. That expansion of developers, experimenters, and testers cannot but help increase innovation opportunities. Technological developments from outer space have been applied to terrestrial life since the earliest days of space exploration. The National Aeronautics and Space Administration (NASA) maintains a website that lists technologies that have spun off from such research projects. Lightweight 21 nanotubes, useful in protecting astronauts during space exploration, are now being tested for applications in emergency response gear and electrical insulation. The need for certainty about the resiliency of materials used in space led to the development of an analytics tool useful across a range of industries. Temper foam, the material used in memory-foam pillows, was developed for NASA for seat covers. As more companies pursue their own space goals, more innovations will likely come from the commercial sector. Outer space is not just a catalyst for technological development. Satellite constellations and their unique line-of-sight vantage point can provide new perspectives to old industries. Deploying satellites into low-Earth orbit, as Facebook wants to do, can connect large, previously-unreached swathes of 22 humanity to the Internet. Remote sensing technology could change how whole industries operate, such as crop monitoring, herd management, crisis response, and land evaluation, among others. 23 While satellites cannot provide all essential information for some of these industries, they can fill in some useful gaps and work as part of a wider system of tools. Space infrastructure, in helping to change how people connect and perceive Earth, could help spark innovations on the ground as well. These innovations, changes to global networks, and new opportunities could lead to wider economic growth.

#### Extinction–outweighs because it causes masses suffering to everyone and prevents any future improvement–if you’re unsure, stay alive to find out

**Matthews 18** Dylan Matthews 10-26-2018 “How to help people millions of years from now”<https://www.vox.com/future-perfect/2018/10/26/18023366/far-future-effective-altruism-existential-risk-doing-good> (Co-founder of Vox, citing Nick Beckstead @ Rutgers University)//Re-cut by Elmer

If you care about improving human lives, you should overwhelmingly care about those quadrillions of lives rather than the comparatively small number of people alive today. The 7.6 billion people now living, after all, amount to less than 0.003 percent of the population that will live in the future. It’s reasonable to suggest that those quadrillions of future people have, accordingly, hundreds of thousands of times more moral weight than those of us living here today do. That’s the basic argument behind Nick Beckstead’s 2013 Rutgers philosophy dissertation, “On the overwhelming importance of shaping the far future.” It’s a glorious mindfuck of a thesis, not least because Beckstead shows very convincingly that this is a conclusion any plausible moral view would reach. It’s not just something that weird utilitarians have to deal with. And Beckstead, to his considerable credit, walks the walk on this. He works at the Open Philanthropy Project on grants relating to the far future and runs a charitable fund for donors who want to prioritize the far future. And arguments from him and others have turned “long-termism” into a very vibrant, important strand of the effective altruism community. But what does prioritizing the far future even mean? The most literal thing it could mean is preventing human extinction, to ensure that the species persists as long as possible. For the long-term-focused effective altruists I know, that typically means identifying concrete threats to humanity’s continued existence — like unfriendly artificial intelligence, or a pandemic, or global warming/out of control geoengineering — and engaging in activities to prevent that specific eventuality. But in a set of slides he made in 2013, Beckstead makes a compelling case that while that’s certainly part of what caring about the far future entails, approaches that address specific threats to humanity (which he calls “targeted” approaches to the far future) have to complement “broad” approaches, where instead of trying to predict what’s going to kill us all, you just generally try to keep civilization running as best it can, so that it is, as a whole, well-equipped to deal with potential extinction events in the future, not just in 2030 or 2040 but in 3500 or 95000 or even 37 million. In other words, caring about the far future doesn’t mean just paying attention to low-probability risks of total annihilation; it also means acting on pressing needs now. For example: We’re going to be better prepared to prevent extinction from AI or a supervirus or global warming if society as a whole makes a lot of scientific progress. And a significant bottleneck there is that the vast majority of humanity doesn’t get high-enough-quality education to engage in scientific research, if they want to, which reduces the odds that we have enough trained scientists to come up with the breakthroughs we need as a civilization to survive and thrive. So maybe one of the best things we can do for the far future is to improve school systems — here and now — to harness the group economist Raj Chetty calls “lost Einsteins” (potential innovators who are thwarted by poverty and inequality in rich countries) and, more importantly, the hundreds of millions of kids in developing countries dealing with even worse education systems than those in depressed communities in the rich world. What if living ethically for the far future means living ethically now? Beckstead mentions some other broad, or very broad, ideas (these are all his descriptions): Help make computers faster so that people everywhere can work more efficiently Change intellectual property law so that technological innovation can happen more quickly Advocate for open borders so that people from poorly governed countries can move to better-governed countries and be more productive Meta-research: improve incentives and norms in academic work to better advance human knowledge Improve education Advocate for political party X to make future people have values more like political party X ”If you look at these areas (economic growth and technological progress, access to information, individual capability, social coordination, motives) a lot of everyday good works contribute,” Beckstead writes. “An implication of this is that a lot of everyday good works are good from a broad perspective, even though hardly anyone thinks explicitly in terms of far future standards.” Look at those examples again: It’s just a list of what normal altruistically motivated people, not effective altruism folks, generally do. Charities in the US love talking about the lost opportunities for innovation that poverty creates. Lots of smart people who want to make a difference become scientists, or try to work as teachers or on improving education policy, and lord knows there are plenty of people who become political party operatives out of a conviction that the moral consequences of the party’s platform are good. All of which is to say: Maybe effective altruists aren’t that special, or at least maybe we don’t have access to that many specific and weird conclusions about how best to help the world. If the far future is what matters, and generally trying to make the world work better is among the best ways to help the far future, then effective altruism just becomes plain ol’ do-goodery.

# Ks

## Fidelity Cap K

#### Forms of fragmented politics completely cedes the political to capitalism. Engagement in undercommon communication is too individualized and resists collective and concrete change. This constitutes enjoyment of melancholic pleasures of being distanced and accommodated to the real world, and as a result remains stuck in parasitic oppression without change – Dean 13:

“Communist Desire”, Jodi Dean, , 2013, LHP AM

An emphasis on the drive dimension of melancholia, on Freud's attention to the way sadism in melancholia is 'turned round upon the subject's own self', leads to an interpretation of the general contours shaping the left that differs from Brown's**. Instead of a left attached to an unaclmowledged orthodoxy,** **we have one that has given way on the desire for communism, betrayed its historical commitment to the proletariat, and sublimated revolutionary energies into restorationist practices that strengthen the hold of capitalism**. **This left has replaced commitments to the emancipatory, egalitarian struggles of working people against capitalism - commitments that were never fully orthodox, but always ruptured, conflicted and contested - with incessant activity** (not unlike the manic Freud also associates with melancholia), and so **now satisfies itself with criticism and interpretation, small projects and local actions, particular issues and legislative victories, art, technology, procedures, and process**. It sublimates revolutionary desire to democratic drive, to the repetitious practices offered up as democracy (whether representative, deliberative or radical). **Having already conceded to the inevitably of capitalism, it noticeably abandons 'any striking power against the big bourgeoisie',** to return to Benjamin's language. For such a left, **enjoyment comes from its withdrawal from responsibility, its sublimation of goals and responsibilities into the branching, fragmented practices of micro-politics, self-care, and issue awareness**. Perpetually slighted, harmed and undone**, this left remains stuck in repetition, unable to break out of the circuits of drive in which it is caught** - unable because it enjoys. **Might this not explain why such a left confuses discipline with domination, why it forfeits collectivity in the name of an illusory, individualist freedom that continuously seeks to fragment and disrupt any assertion of a collective or a common?** The watchwords of critique within this structure of left desire are moralism, dogmatism, authoritarianism and utopianism - watchwords enacting a perpetual self-surveillance: has an argument, position or view inadvertently rukeo one of these errors? Even some of its militants reject party and state, division and decision, securing in advance an inefficacy sure to guarantee it the nuggets of satisfaction drive provides. **If this left is rightly described as melancholic, and I agree with Brown that it is, then its melancholia derives from the real existing compromises and betrayals inextricable from its history - its accommodations with reality, whether of nationalist war, capitalist encirclement, or so-called market demands.** Lacan teaches that, like Kant's categorical imperative, the super-ego refuses to accept reality as an explanation for failure. Impossible is no excuse - desire is always impossible to satisfy. A wide spectrum of the contemporary left has either accommodated itself, in one or another, to an inevitable capitalism or taken the practical failures of Marxism-Leninism to require the abandonment of antagonism, class, and revolutionary commitment to overturning capitalist arrangements of property and production. **Melancholic fantasy (the communist Master, authoritarian and obscene) as well as sublimated, melancholic practices (there was no alternative) shield this left, shield Ltd, from confrontation with guilt over such betrayal as they capture us in activities that feel productive, important, radical.**

#### The alternative is the politics of the comrade – one that is oriented toward a shared communist horizon – only our methodology can fight capitalism, anything else allows it to take over co-opting any movement – Dean 19:

Dean, Jodi. Comrade: An essay on political belonging. Verso, 2019. // LHP BT + LHP PS

The term ***comrade* indexes a political relation, a set of expectations for action toward a common goal**. **It highlights the sameness of those on the same side—no matter their differences, comrades stand together**. As Obama’s joke implies, when you share a politics, you don’t generally distance yourself from your comrades. **Comradeship binds action**, **and in** this binding, **this solidarity, it** collectivizes and **directs action in light of a shared vision for the future**. **For communists, this is the egalitarian future of a society emancipated from the determinations of private property and capitalism and reorganized according to the free association, common benefit, and collective decisions of the producers.** But the term comrade predates its use by communists and socialists. In romance languages, comrade first appears in the sixteenth century to designate one who shares a room with another. Juan A. Herrero Brasas cites a Spanish historical-linguistic dictionary’s definition of the term: “*Camarada* is someone who is so close to another man that he eats and sleeps in the same house with him.”[2](about:blank) In French, the term was originally feminine, *camarade*, and referred to a barracks or room shared by soldiers.[3](about:blank) Etymologically, comrade derives from *camera*, the Latin word for room, chamber, and vault. The technical connotation of *vault* indexes a generic function, the structure that produces a particular space and holds it open.[4](about:blank) A chamber or room is a repeatable structure that takes its form by producing an inside separate from an outside and providing a supported cover for those underneath it. Sharing a room, sharing a space, generates a closeness, an intensity of feeling and expectation of solidarity that differentiates those on one side from those on the other. Comradeship is a political relation of supported cover. Interested in comrade as a mode of address, carrier of expectations, and figure of belonging in the communist and socialist traditions, I emphasize **the comrade as a generic figure for the political relation between those on the same side of a political struggle. Comrades are those who  tie themselves together instrumentally, for a common purpose: *If we want to win—and we have to win—we must act together*.** As Angela Davis describes her decision to join the Communist Party:I wanted an anchor, a base, a mooring. I needed comrades with whom I could share a common ideology. I was tired of ephemeral ad-hoc groups that fell apart when faced with the slightest difficulty; tired of men who measured their sexual height by women’s intellectual genuflection. It wasn’t that I was fearless, but I knew that to win, we had to fight and the fight that would win was the one collectively waged by the masses of our people and working people in general. I knew that this fight had to be led by a group, a party with more permanence in its membership and structure and substance in its ideology.[5](about:blank) **Comrades are those you can count on. You share enough of a common ideology,** enough of a commitment to common principles and goals, **to do more than one-off actions. Together you can fight the long fight. As comrades, our actions are voluntary, but they are not always of our own choosing**. **Comrades have to be able to count on each other even when we don’t like each other and even when we disagree. We do what needs to be done because we owe it to our comrades.** In *The Romance of American Communism*, Vivian Gornick reports the words of a former member of the Communist Party USA, or CPUSA, who hated the daily grind of selling papers and canvassing expected of party cadre, but nevertheless, according to her, “I did it. I did it because if I didn’t do it, I couldn’t face my comrades the next day. And we all did it for the same reason: we were accountable to each other.”[6](about:blank) Put in psychoanalytic terms, the comrade functions as an ego ideal: the point from which party members assess themselves as doing important, meaningful work.[7](about:blank)Being accountable to another entails seeing your actions through their eyes. Are you letting them down or are you doing work that they respect and admire?In *Crowds and Party*, I present the good comrade as an ideal ego, that is to say, as how party members imagine themselves.[8](about:blank) They may imagine themselves as thrilling orators, brilliant polemicists, skilled organizers, or courageous militants. In contrast with my discussion there, in the current book, I draw out how **the comrade** **also functions as an ego ideal, the perspective that party members—and often fellow travelers—take toward themselves**. This perspective is the effect of belonging on the same side as it works back on those who have committed themselves to common struggle. The comrade is a symbolic as well as an imaginary figure and it is the symbolic dimension of ego ideal I focus on here. My thinking about the comrade as a generic figure for those on the same side flows out of my work on communism as the horizon of left politics and my work on the party as the political form necessary for this politics.[9](about:blank) **To see our political horizon as communist is to highlight the emancipatory egalitarian struggle of the proletarianized against capitalist exploitation—that is, against the determination of life by market forces; by value; by the division of labor (on the basis of sex and race); by imperialism (theorized by Lenin in terms of the dominance of monopoly and finance capital); and by neocolonialism (theorized by Nkrumah as the last stage of imperialism).** **Today we see this horizon in struggles such as those led by women of color against police violence, white supremacy, and the murder and incarceration of black, brown, and working-class people. We see it in the infrastructure battles around pipelines, climate justice, and barely habitable cities with undrinkable water and contaminated soil. We see it in the array of social reproduction struggles against debt, foreclosure, and privatization, and for free, quality public housing, childcare, education, transportation, healthcare, and other basic services. We see it in the ongoing fight of LGBTQ people against harassment, discrimination, and oppression.** It is readily apparent today that **the communist horizon is the horizon of political struggle** not for the nation but **for the world**; it is an international horizon. This is evident in the antagonism between the rights of immigrants and refugees and intensified nationalisms; in the necessity of a global response to planetary warming; and in anti-imperialist, decolonization, and peace movements. In these examples, **communism is a force of negativity, the negation of the global capitalist present.** **Communism is also the name for the positive alternative to capitalism’s permanent and expanding exploitation, crisis, and immiseration, the name of a system of production based on meeting social needs**—*from each according to ability to each according to need*, to paraphrase Marx’s famous slogan—in a way that is collectively determined and carried out by the producers. This positive dimension of communism attends to social relations, to how people treat each other, animals, things, and the world around them**. Building communism entails more than resistance and riot. It requires the emancipated egalitarian organization of collective life.** With respect to the party, intellectuals on the contemporary left tend to extract the party from the aspirations and accomplishments it enabled. Communist philosophers who disagree on a slew of theoretical questions, such as Antonio Negri and Alain Badiou, converge on the organizational question—no party! **The party has been rejected as authoritarian**, as outmoded, as ill-fitting a society of networks. **Every other mode of political association may be revised, renewed, rethought, or reimagined except for the party of communists**. **This rejection of the party** as a form for left politics is a mistake. It **ignores the effects of association on those engaged in common struggle.** **It fails to learn from the everyday experiences of generations of activists**, organizers, and revolutionaries. **It relies on a narrow, fantasied notion of the party as a totalitarian machine.** It neglects the courage, enthusiasm, and achievements of millions of party members for over a century. **Rejection of the party form has been left dogmatism** for the last thirty years **and has gotten us nowhere**. Fortunately, the movements of the squares in Greece and Spain, as well as lessons from the successes and limits of the Occupy movement, have pushed against this left dogmatism. They have reenergized interest in the party as a political form that can scale; a form that is flexible, adaptive, and expansive enough to endure beyond the joyous and disruptive moments of crowds in the streets. A theory of the comrade contributes to this renewal by drawing out the ways that shared commitment to a common struggle generates new strengths and new capacities. Over and against the reduction of party relations to the relations between the leaders and the led, comrade attends to the effects of political belonging on those on the same side of a political struggle. **As we fight together for a world free of exploitation, oppression, and bigotry, we have to be able to trust and count on each other. Comrade names this relation. The comrade relation remakes the place from which one sees, what it is possible to see, and what possibilities can appear**. It enables the revaluation of work and time, what one does, and for whom one does it. Is one’s work done for the people or for the bosses? Is it voluntary or done because one has to work? Does one work for personal provisions or for a collective good? We should recall Marx’s lyrical description of communism in which work becomes “life’s prime want.” We get a glimpse of that in comradeship: **one *wants* to do political work**. **You don’t want to let down your comrades**; you see the value of your work through their eyes, your new collective eyes. **Work, determined not by markets but by shared commitments, becomes fulfilling**. French communist philosopher and militant Bernard Aspe discusses the problem of contemporary capitalism as a loss of “common time”; that is, the loss of an experience of time generated and enjoyed through our collective being-together.[10](about:blank) From holidays, to meals, to breaks, whatever common time we have is synchronized and enclosed in forms for capitalist appropriation. Communicative capitalism’s apps and trackers amplify this process such that the time of consumption can be measured in much the same way that Taylorism measured the time of production: How long did a viewer spend on a particular web page? Did a person watch a whole ad or click off of it after five seconds? In contrast, the common action that is the actuality of communist movement induces a collective change in capacities. Breaking from capitalism’s 24-7 injunctions to produce and consume for the bosses and owners, the discipline of common struggle expands possibilities for action and intensifies the sense of its necessity. The comrade is a figure for the relation through which this transformation of work and time occurs. **How do we imagine political work? Under conditions where political change seems completely out of reach, we might imagine political work as self-transformation**. At the very least, we can work on ourselves. In the intensely mediated networks of communicative capitalism, we might see our social media engagements as a kind of activism where Twitter and Facebook function as important sites of struggle. Perhaps we understand writing as important political work and hammer out opinion pieces, letters to the editors, and manifestoes. When we imagine political work, we often take electoral politics as our frame of reference, focusing on voting, lawn signs, bumper stickers, and campaign buttons. Or we think of activists as those who arrange phone banks, canvass door-to-door, and set up rallies. In yet another political imaginary, we might envision political work as study, whether done alone or with others. We might imagine political work as cultural production, the building of new communities, spaces, and ways of seeing. Our imaginary might have a militant, or even militarist, inflection: political work is carried out through marches, occupations, strikes, and blockades; through civil disobedience, direct action, and covert operations. Even with the recognition of the wide array of political activities, the ways people use them to respond to specific situations and capacities, and how they combine to enhance each other, we might still imagine radical political work as punching a Nazi in the face.Throughout these various actions and activities, how are the relations among those fighting on the same side imagined? How do the activists and organizers, militants and revolutionaries relate to one another? During the weeks and months when the Occupy movement was at its peak, relations with others were often infused with a joyous sense of being together, with an enthusiasm for the collective co-creation of new patterns of action and ways of living.[11](about:blank) But the feeling didn’t last. **The pressures of organizing diverse people and politics under conditions of police repression and real material need wore down even the most committed activists.** Since then, on social media and across the broader left, **relations among the politically engaged have again become tense and conflicted, often along lines of race and gender. Dispersed and disorganized, we’re uncertain of whom to trust and what to expect. We encounter contradictory injunctions to self-care and call out. Suspicion undermines support. Exhaustion displaces enthusiasm**. **Attention to comradeship, to the ways that shared expectations make political work not just possible but also gratifying, may help redirect our energies back to our common struggle.** As former CPUSA member David Ross explained to Gornick:I knew that I could never feel passionately about the new movements as I had about the old, I realized that the CP has provided me with a sense of comradeship I would never have again, and that without that comradeship I could *never* be political.[12](about:blank)For Ross, the Communist Party is what made Marxism. The party gave Marxism life, political purpose. This life-giving capacity came from comradeship. Ross continues: “The idea of politics as simply a diffused consciousness linked only to personal integrity was—*is*—anathema to me.” His description of politics as “a diffused consciousness linked only to personal integrity” fits today’s left milieus. Perhaps, then, his remedy—comradeship—will as well. Various people have told me their stories of feeling a rush of warmth when they were first welcomed into their party as a comrade. I’ve had this feeling myself. In his memoir *Incognegro: A Memoir of Exile and Apartheid*, the theorist Frank Wilderson, a former member of uMkhonto weSizwe, or MK, the armed wing of the African National Congress (ANC), describes his first meeting with Chris Hani, the leader of the South African Communist Party and the chief of staff of MK. Wilderson writes, “I beamed like a schoolboy when he called me ‘comrade.’”[13](about:blank) Wilderson chides himself for what he calls a “childish need for recognition.”[14](about:blank) Perhaps because he still puts Hani on a pedestal, he feels exposed in his enjoyment of the egalitarian disruption of comradeship. Wilderson hasn’t yet internalized the idea that he and Hani are political equals. “Comrade” **holds out an equalizing promise, and when that promise is fulfilled, we confront our own continuing** yet **unwanted attachments to hierarchy, prestige, inadequacy. Accepting equality takes courage.** Wilderson’s joy in hearing Hani call him “comrade” contrasts sharply with another instance Wilderson recounts where comrade was the term of address**. In 1994, shortly before Wilderson was forced to leave South Africa, he encountered Nelson Mandela** at an event hosted by *Tribute*magazine. **After Mandela’s public remarks, Wilderson asked a question in which he addressed Mandela as “comrade.”** “Not Mr. Mandela. Not sir, like the fawning advertising mogul who asked the first question. **Comrade Mandela. It stitched him back into the militant garb he’d shed since the day he left prison.”**[15](about:blank) **Wilderson’s recollection shows how comrade’s equalizing insistence can be aggressive, an imposition of discipline. This is part of its power. Addressing another as “comrade” reminds them that something is expected of them. Discipline and joy are two sides of the same coin**, two aspects of comradeship as a mode of political belonging. As a form of address, figure of political relation, and carrier of expectations, comrade **disrupts capitalist society’s hierarchical identifications of sex, race, and class.** It **insists on** the **equalizing sameness of those on the same side of a political struggle** and **renders that** equalizing sameness **productive of new modes of work and belonging. In this respect, comrade is a carrier of utopian longings** in the sense theorized by Kathi Weeks. Weeks presents **the utopian form** as **carrying out two functions**: “One function is to alter our connection to the present, while the other is to shift our relationship to the future; one is productive of estrangement, the other of hope.”[16](about:blank) **The first function mobilizes the negativity of disidentification and disinvestment**. **Present relations** **become** strange, **less binding on our sense of possibility**. The second function **redirects “our attention and energies toward an open future** … providing a vision or glimmer of a better world.”[17](about:blank) **The power of comrade is in how it negates old relations and promises new ones—the promise itself ushers them in,** welcoming the new comrade into relations irreducible to their broader setting.

#### The role of the ballot is fidelity to the truth – dedication to a shared horizon is liberatory, Dean 19:

Dean, Jodi. Comrade: An essay on political belonging. Verso, 2019. // LHP BT + LHP PS

The idea that comrades are those who belong to the same side of a political struggle leads to the fourth thesis: **The** relation between comrades is mediated by **fidelity to a** truth**;** practices **of comradeship** materialize **this** fidelity**. The “same side” points to the truth comrades are faithful to—the political truth that unites them**—**and the fidelity with which they work to realize this truth in the world.** “Belonging” invites attention to the expectations, practices, and affects that being on the same side generates. The notions of truth and fidelity at work here come from Alain Badiou. In brief, **Badiou rejects the idea of truth as a proposition or judgment, arguing instead that** truth is a process**. The process begins with the eruption of something new, an event.** **Because an event changes the situation, breaks the confines of the given, it is undecidable in terms of the given; it is something entirely new**. Badiou argues that this undecidability “induces the appearance of a *subject* of the event.”[60](about:blank) **This subject isn’t the cause of the event. It’s an effect of or response to the event,** “the decision to *say* that the event has taken place.” Grammar might seduce us into rendering this subject as “I.” **We should** avoid this temptation and **recognize the subject** **as** designating an inflection point, **a response that extends the event.** **The decision that a truth has appeared, that an event has occurred, incites a process of verification**, the “infinite procedure of verification of the true,” **in** **what Badiou calls an “exercise of fidelity**.”[61](about:blank) **Fidelity is a working out and working through of the truth, an engagement with truth that extends out into and changes the world. We should recognize here the unavoidably collective dimension of fidelity: in the political field, verification is a struggle of the many.** Peter Hallward draws out some implications of Badiou’s conception of truth. First, it is subjective. Those faithful to an evental truth involve themselves in working it out, exploring its consequences.[62](about:blank) Second, fidelity is not blind faith; it is rigorous engagement unconcerned with individual personality and incorporated into the body of truth that it generates. Hallward writes:Fidelity is, by definition, ex-centric, directed outward, beyond the limits of a merely personal integrity. To be faithful to an evental implication always means to abandon oneself, rigorously, to the unfolding of its consequences. **Fidelity implies that, if there is truth, it can be only cruelly indifferent to the private as such.** **Every truth involves a kind of anti-privatization, a subjective collectivization. In truth, “I” matter only insofar as I am subsumed by the impersonal vector of truth—say, the political organization, or the scientific research program.**[**63**](about:blank) **The truth process builds a new body**. This body of truth is a collective formed to “work for the consequences of the new” and this work, this collective, disciplines and subsumes the faithful.[64](about:blank)Third, collectivity does not imply uniformity. The infinite procedure of verification incorporates multiple experiments, enactments, and effects.Badiou writes, “An organization lies at the intersection between an Idea and an event. However, this intersection only exists as process, whose immediate subject is the political militant.”[65](about:blank) We should amend this statement by replacing *militant* with *comrade*. Comrade highlights the “discipline of the event,” the way that political fidelity cannot be exercised by a solitary individual—hence, the Marxist-Leninist emphasis on the unity of theory and practice, the barren incapacity of each alone. Comrade also affirms the self-abandonment accompanying fidelity to a truth: its vector, its unfolding, is indifferent to my personal experiences and inclinations. For communists, the process of truth has a body and that body is the party, in both its historical and formal sense. Already in *Theory of the Subject*, Badiou recognizes the necessity of a political body, the party as the “subject-support of all politics.”[66](about:blank) He writes:The party is the body of politics, in the strict sense. The fact that there is a body by no means guarantees that there is a subject … But for there to be a subject, for a subject to be found, there must be the support of a body.[67](about:blank) **As a figure of political belonging, the comrade is a faithful response to the evental rupture of crowds and movements, to the egalitarian discharge that erupts from the force of the many where they don’t belong, to the movement of the people as the subject of politics.**[**68**](about:blank) **Comrades demonstrate fidelity through political work; through concerted, disciplined engagement. Their practical political work extends the truth of the emancipatory egalitarian struggle of the oppressed into the world.** Amending Badiou (by drawing from his earlier work), we can say that the comrade is not a faithful subject but a political relation faithful to the divided people as the subject of emancipatory egalitarian politics.[69](about:blank) **For us to see the revolutionary people as the subject in the struggles of the oppressed, for their subject to be found, we must be comrades.** In *Ninotchka*, Nina Ivanova Yakushova can’t tell who her comrades are by looking at them. The party has told her who to look for, but she has to ask. After Iranoff identifies himself, Yakushova tells him her name and the name and position of the party comrade who authorized her visit. Iranoff introduces Buljanoff and Kopalski. Yakushova addresses each as comrade. But it’s not the address that makes them all comrades. They are comrades because they are members of the same party. **The party is the organized body of truth that mediates their relationship. This mediation makes clear what is expected of comrades—disciplined, faithful work.** Iranoff, Buljanoff, and Kopalski have not been doing the work expected of comrades, which is why Moscow sent Yakushova to oversee them in Paris. That Kopalski says they would have greeted her with flowers demonstrates their *embourgeoisment*, the degeneration of their sense of comradeship. But they are all there for work. Gendered identity and hierarchy don’t mediate relations between comrades. The practices of fidelity to a political truth, the work done toward building that truth in the world, do. The solidarity of comrades in political struggle arises out of the intertwining of truth, practice, and party. It’s not reducible to any of these alone. **Comrades are not simply those who believe in the same truth—as in, for example, the idea of communism. Their fidelity to a certain truth is manifested in practical work.** Work for the realization of a political truth brings people into comradely relation. **But carrying out similar tasks in fidelity to the same truth isn’t sufficient for comradeship. The work must be in common; no one is a comrade on their own. Practices of comradeship are coordinated, organized. The party is the organization out of which comradeship emerges and that comrade relations produce. It concentrates comradeship even as comradeship exceeds it.**

# T

## T – Public Trust Doctrine

#### Interpretation: appropriation involves permanent, exclusive use of land and resource extraction. The aff must defend that appropriation of outer space by private entities is unjust.

Stephen Gorove, Stephen Gorove (1917-2001) was a space law education pioneer. He served as a professor of space law and director of space studies and policy, from 1991-1998, at the University of Mississippi., 1969 " Interpreting Article II of the Outer Space Treaty" Fordham Law Review, https://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=1966&context=flr

With respect to the concept of appropriation the basic question is **what constitutes "appropriation,"** as used in the Treaty, especially in contradistinction to casual or temporary use. The term "appropriation" is used most frequently to denote the taking of property for one's own or exclusive use with a sense of permanence. Under such interpretation the establishment of a permanent settlement or the carrying out of commercial activities by nationals of a country on a celestial body may constitute national appropriation if the activities take place under the supreme authority (sovereignty) of the state. Short of this, if the state wields no exclusive authority or jurisdiction in relation to the area in question, the answer would seem to be in the negative, unless, the nationals also use their individual appropriations as cover-ups for their state's activities.5 In this connection, it should be emphasized that the word "appropriation" indicates a taking which involves something more than just a casual use. Thus a temporary occupation of a landing site or other area, just like the **temporary or nonexclusive use of property, would not constitute appropriation**. By the same token, any use involving consumption or **taking with intention of keeping for one's own exclusive use would amount to appropriation.**

#### Violation – application of PTD to space isn’t permanent, it’s context dependent and depends on cost benefit analysis

**WEF n.d.** -- (“Public Trust Doctrine.” Water Education Foundation, The Water Education Foundation is a nonprofit organization whose goal is to provide unbiased, balanced information on water issues in California and the Southwestern United States. The Foundation's mission, since its founding in 1977, has been "to create a better understanding of water resources and foster public understanding and resolution of water resource issues through facilitation, education and outreach,” <https://www.watereducation.org/aquapedia/public-trust-doctrine>, HKR-AS)

Rooted in Roman law, the public trust doctrine recognizes the public right to many natural resources including “the air, running water, the sea and its shore.”

The public trust doctrine requires the sovereign, or state, to hold in trust designated resources for the benefit of the people. Traditionally, the public trust applied to commerce and fishing in navigable waters, but its uses were expanded in California in 1971 to include fish, wildlife, habitat and recreation.

At that time, the California Supreme Court in Marks v. Whitney broadened the definition of public trust because “public trust uses are sufficiently flexible to **encompass changing public needs**.” This definition would be first applied in a legal case in the 1980s (see below). [See also California water rights.]

Mono Lake Case

In California, public trust was most notably invoked in a landmark case involving water use at Mono Lake.

In a landmark case filed to protect the Mono Lake Basin from 40 years of water diversions by the city of Los Angeles, California’s Supreme Court ruled in 1983 that reasonable and beneficial uses of water **must be interpreted in accordance with public trust needs**. This was the first case in California where the public trust doctrine was applied.

Significantly, the Mono Lake decision held that the state retains jurisdiction over these rights and may reconsider the impact on public trust, which in addition to the traditional commerce, navigation and fishing, includes wildlife habitat. The necessity of protecting the public trust was to be determined by balancing the value and cost of instream water needs against the benefits and costs of diversions. [Purchase the Layperson’s Guide to Water Rights to learn more about public trust.]

#### Plan text in a vacuum bad for fairness because it allows for incongruency between 99% of the aff and 1% of the aff – the worst version of their model is that the plan text is different from the advantage, so it makes no sense – hold them to reading a plan text defined contextually with the advantage

#### Vote neg –

#### 1] Ground – allowing affs to not defend permanent appropriation kills negative ground – we can’t read the innovation DA, since they can say innovative appropriation efforts are allowed, we can’t read asteroid mining or disads to specific types of appropriation since they can defend an exemption for that, etc. – Since the government gets to interpret whether or not the PTD applies to appropriation in specific instances, the negative can’t reasonably predict what the aff defends restricting and what it doesn’t. Ground controls the internal link to clash and fairness since the aff makes being neg impossible.

#### T is a voting issue that should be evaluated through competing interps – it tells the negative what to prepare for and reasonability invites judge intervention

## Nebel T

#### Interpretation: “Private entities” is a generic bare plural. The aff may not defend that a subset of nations ban the appropriation of outer space.

Nebel 19. [Jake Nebel is an assistant professor of philosophy at the University of Southern California and executive director of Victory Briefs. He writes a lot of this stuff lol – duh.] “Genericity on the Standardized Tests Resolution.” Vbriefly. August 12, 2019. <https://www.vbriefly.com/2019/08/12/genericity-on-the-standardized-tests-resolution/?fbclid=IwAR0hUkKdDzHWrNeqEVI7m59pwsnmqLl490n4uRLQTe7bWmWDO_avWCNzi14> TG

Both distinctions are important. Generic resolutions can’t be affirmed by specifying particular instances. But, since generics tolerate exceptions, plan-inclusive counterplans (PICs) do not negate generic resolutions.

Bare plurals are typically used to express generic generalizations. But there are two important things to keep in mind. First, generic generalizations are also often expressed via other means (e.g., definite singulars, indefinite singulars, and bare singulars). Second, and more importantly for present purposes, bare plurals can also be used to express existential generalizations. For example, “Birds are singing outside my window” is true just in case there are some birds singing outside my window; it doesn’t require birds in general to be singing outside my window.

So, what about “colleges and universities,” “standardized tests,” and “undergraduate admissions decisions”? Are they generic or existential bare plurals? On other topics I have taken great pains to point out that their bare plurals are generic—because, well, they are. On this topic, though, I think the answer is a bit more nuanced. Let’s see why.

“Colleges and universities” is a generic bare plural. I don’t think this claim should require any argument, when you think about it, but here are a few reasons.

First, ask yourself, honestly, whether the following speech sounds good to you: “Eight colleges and universities—namely, those in the Ivy League—ought not consider standardized tests in undergraduate admissions decisions. Maybe other colleges and universities ought to consider them, but not the Ivies. Therefore, in the United States, colleges and universities ought not consider standardized tests in undergraduate admissions decisions.” That is obviously not a valid argument: the conclusion does not follow. Anyone who sincerely believes that it is valid argument is, to be charitable, deeply confused. But the inference above would be good if “colleges and universities” in the resolution were existential. By way of contrast: “Eight birds are singing outside my window. Maybe lots of birds aren’t singing outside my window, but eight birds are. Therefore, birds are singing outside my window.” Since the bare plural “birds” in the conclusion gets an existential reading, the conclusion follows from the premise that eight birds are singing outside my window: “eight” entails “some.” If the resolution were existential with respect to “colleges and universities,” then the Ivy League argument above would be a valid inference. Since it’s not a valid inference, “colleges and universities” must be a generic bare plural.

Second, “colleges and universities” fails the [upward-entailment test](https://plato.stanford.edu/entries/generics/#IsolGeneInte) for existential uses of bare plurals. Consider the sentence, “Lima beans are on my plate.” This sentence expresses an existential statement that is true just in case there are some lima beans on my plate. One test of this is that it entails the more general sentence, “Beans are on my plate.” Now consider the sentence, “Colleges and universities ought not consider the SAT.” (To isolate “colleges and universities,” I’ve eliminated the other bare plurals in the resolution; it cannot plausibly be generic in the isolated case but existential in the resolution.) This sentence does not entail the more general statement that educational institutions ought not consider the SAT. This shows that “colleges and universities” is generic, because it fails the upward-entailment test for existential bare plurals.

Third, “colleges and universities” fails the adverb of quantification test for existential bare plurals. Consider the sentence, “Dogs are barking outside my window.” This sentence expresses an existential statement that is true just in case there are some dogs barking outside my window. One test of this appeals to the drastic change of meaning caused by inserting any adverb of quantification (e.g., always, sometimes, generally, often, seldom, never, ever). You cannot add any such adverb into the sentence without drastically changing its meaning. To apply this test to the resolution, let’s again isolate the bare plural subject: “Colleges and universities ought not consider the SAT.” Adding generally (“Colleges and universitiesz generally ought not consider the SAT”) or ever (“Colleges and universities ought not ever consider the SAT”) result in comparatively minor changes of meaning. (Note that this test doesn’t require there to be no change of meaning and doesn’t have to work for every adverb of quantification.) This strongly suggests what we already know: that “colleges and universities” is generic rather than existential in the resolution.

#### Precision o/w – anything else justifies the aff arbitrarily jettisoning words in the resolution at their whim which decks negative ground and preparation because the aff is no longer bounded by the resolution.

#### Violation – They specified China

#### Standards:

#### Limits and ground – their model allows affs to defend any combination of private entities in any countries which explodes negative burden and causes random affs every tournament

#### Drop the debater:– we can’t restart the round from the 1AC and I’m skewed for the rest of the debate.

## Extra-T

**Interp: The affirmative must only defend “Resolved: The appropriation of outer space by private entities is unjust”**

**Resolved means a policy**

**Find Law Legal Dictionary** <https://dictionary.findlaw.com/definition/resolve.html> //SR

2 : a legal or official determination

**Appropriation–**

Timothy Justin **Trapp**, JD Candidate @ UIUC Law, **’13**, TAKING UP SPACE BY ANY OTHER MEANS: COMING TO TERMS WITH THE NONAPPROPRIATION ARTICLE OF THE OUTER SPACE TREATY UNIVERSITY OF ILLINOIS LAW REVIEW [Vol. 2013 No. 4]

The issues presented in relation to the nonappropriation article of the Outer Space Treaty should be clear.214 The ITU has, quite blatantly, created something akin to “property interests in outer space.”215 It allows nations to exclude others from their orbital slots, even when the nation is not currently using that slot.216 This is directly in line with at least one definition of outer-space appropriation.217 [\*\*Start Footnote 217\*\*Id. at 236 (“Appropriation of outer space, therefore, is ‘the exercise of exclusive control or exclusive use’ with a sense of permanence, which limits other nations’ access to it.”) (quoting Milton L. Smith, The Role of the ITU in the Development of Space Law, 17 ANNALS AIR & SPACE L. 157, 165 (1992)). \*\*End Footnote 217\*\*]The ITU even allows nations with unused slots to devise them to other entities, creating a market for the property rights set up by this regulation.218 In some aspects, this seems to effect exactly what those signatory nations of the Bogotá Declaration were trying to accomplish, albeit through different means.219

**Outer Space–**

**Merriam Webster** <https://www.merriam-webster.com/dictionary/outer%20space> //SR

: space immediately outside the earth's atmosphere

**Private entities–**

**USLegal** Private Entity Law and Legal Definition <https://definitions.uslegal.com/p/private-entity/> //SR

According to 2 CFR 175.25 [Title 2 Grants and Agreements; Subtitle A Office of Management and Budget Guidance for Grants and Agreements], private entity means "any entity other than a State, local government, Indian tribe, or foreign public entity. (2) This term includes: (i) A nonprofit organization, including any nonprofit institution of higher education, hospital, or tribal organization other than one included in the definition of Indian tribe (ii) A for-profit organization."

**Vote neg for limits: their model has no resolutional bound and creates the possibility for literally an infinite number of 1ACs. Not debating the topic allows someone to specialize in one area of the library for 4 years giving them a huge edge over people who switch research focus ever 2 months. Cutting negs to every possible aff wrecks small schools, which has a disparate impact on under-resourced and minority debaters. Counter-interpretations are arbitrary, unpredictable, and don’t solve the world of neg prep because there’s no grounding in the resolution**

**Fairness outweighs – [1] it’s an intrinsic good – debate is a game that requires rules to evaluate it--it ensures a structure to make their aff heard and to deny fairness’s value is a performative contradiction since you obviously cared about other rules such as speech times. If fairness didn’t matter, you should just hack against them and evaluate their arguments unfairly, making responses circular [2] Link turns their education offense – getting to the third and fourth level of tactical engagement is only possible with refined and well-researched positions connected to the resolutional mechanism. Repeated debates over core issues incentivize innovative argument production and improved advocacy based on feedback and nuanced responses from opponents. [3] Probability – The role of individual debate rounds on broader subject formation is white noise – can you remember what happened in (this round)? – individual rounds don’t affect our subjectivity, so fairness is the only impact your ballot can resolve. You should presume all their truth claims false because they have not been properly tested**

**Terminal defense to their model – [1] TVA solves - \_\_. Disads to the TVA prove it true since it proves there is neg ground [2] SSD solves - read it when you negate for the same content education [3] Discuss your aff out of round when people are willing to listen and not make dumb arguments for the W**

**Drop the debater for deterrence since the round has already been skewed. Competing interps--reasonability is arbitrary and causes a race to the bottom. Even if their aff is answerable, the ones they incentivize are not which means you presume the worst possible affs because people inevitably want to be as abusive as possible for the win and they create a model of self care. No rvi’s or impact turns - [1] they’d purposefully be abusive to bait us into reading bad arguments and can drill it a lot chilling us from checking abuse [2] You shouldn’t win for being T - if you win T is a bad thing then its at most just a reason we should drop it to let us learn from our mistakes [3] Only reason we read T is because we were pigeonholed and had nothing else to read [4] T just says the aff is a bad idea like any other argument, under their logic every argument for why the aff is a bad idea would also be an independent voter [5] We don’t force you to do anything - we just propose a norm that can be subject to change**

**1ar theory is bad since you get 2ar ethos to blow up a 20 second shell we overcover and responses to my counter interp will be new causing intervention. No infinite abuse: 1. Our standards means its a bad way to check infinite abuse 2. NC only has a finite amount of time 3. Preempts in the 1ac solve**

## T – Policy

**Interp: The affirmative must only defend the hypothetical enactment of the resolution “Resolved: The appropriation of outer space by private entities is unjust”**

**Resolved means a policy**

**Find Law Legal Dictionary** <https://dictionary.findlaw.com/definition/resolve.html> //SR

2 : a legal or official determination

**Appropriation–**

Timothy Justin **Trapp**, JD Candidate @ UIUC Law, **’13**, TAKING UP SPACE BY ANY OTHER MEANS: COMING TO TERMS WITH THE NONAPPROPRIATION ARTICLE OF THE OUTER SPACE TREATY UNIVERSITY OF ILLINOIS LAW REVIEW [Vol. 2013 No. 4]

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**Violation–no “i affirm the res” in the aff–their advocacy is “refusing to participate in capitalism” – it’s extra T at worst which still explodes limits**

**Vote negative for limits---the resolution is the most predictable stasis point for debates, anything outside of that ruins prep and clash by allowing the affirmative to pick any grounds for debate. That greenlights a race away from the core topic controversies that allow for robust contestation, which favors the aff by making neg ground inapplicable, susceptible to the perm, or concessionary.**

**The impact is iterative content mastery---getting to the third and fourth level of tactical engagement is only possible with refined and well-researched positions connected to the resolutional mechanism. Repeated debates over core issues incentivize innovative argument production and improved advocacy based on feedback and nuanced responses from opponents.**

**Independently, fairness outweighs because 1. All arguments including the aff presume that they are evaluated fairly conceding it’s authority 2. We can’t verify their thesis if we can’t engage in the aff and 3. The win is what motivates people to listen - if you don’t understand how they create change by the end of this round but you do understand why iterative testing and fair clash is good for debate - vote negative.**

**TVA solves–don’t defend method offense**

**Drop the debater for deterrence and competing interps since reasonability is arbitrary, causes a race to the bottom, always flips aff since they can re-spin the round in the 2ar to sound reasonable with ethos, and collapses to competing interpretations of a reasonable brightline. No rvis or impact turns - if they were abusive they forced us to go for T and impact turns force the 2nr to go for T and defend a violent practice rather than learning from our mistakes - they’re incentivized to bait T to call us out which chills negs from checking any abuse.**

**No 1ar theory or voting issues–you get 2ar ethos to blow up a 20 second arg and the 2n is forced to overcover and the round becomes irresolvable since the judge has to decide if new 2ar arguments are sufficient to beat back new 2n ones**

## T - Fiat

#### Interpretation: The affirmative must not defend a non-status quo policy option. To clarify, the affirmative may not fiat \_\_\_\_\_ (their advocacy)

#### Violation: They do (explain)

#### Vote neg:

#### 1] Precision – the resolution doesn’t entail an actor nor does it an action – they are definitionally not topical or even a subset of the resolution – vote them down –

#### A] stasis point – the topic is the only reasonable focal point for debate – anything else destroys the possibility of debate because we will be two ships passing –

#### B] internal link turn – violating semantics justifies the aff talking about whatever with zero neg prep or prediction which is the most unfair and educational –

#### C] Jurisdiction – you can’t vote for them because the ballot and the tournament invitation say to vote for the better debater in the context of the resolution –

#### D] objectivity – only semantics are objective whereas pragmatics are subjective which means intervention

#### 2] Limits – they explode them – they are super Extra T and justify an infinite possible number of affirmatives and different actors – none of which are part of the resolution which means there is no prediction ground. Multiple Impacts – A] Stable Ground – they deck neg preparation ability and impose an infinitely reciprocal research burden on the negative to have to guess the infinite policy options and possible permutations and to cut specific disads to those - B] Predictability – no actor or action means its impossible to have a way to predict affs on this topic which decks quality engagement and education – C] Infinite Abuse – being non-topical justifies picking a trivially true aff which means they always win

#### 3] TVA – don’t defend an action and use ideal theory to explain why appropriation is bad - That’s better – it promotes in-depth philosophical clash over law that’s constitutive to LD

# NCs

## Util, Flexible

#### the standard is maximizing expected wellbeing

#### Independently:

#### 1] Death matters – [a] trillions of people means the future holds a lot of value which extinction destroys [b] turns suffering – lack of access to food, water, shelter

#### 2] Even the most conservative estimates prove reducing existential risk outweighs all other impacts, regardless of probability – actively prioritize our calculus since you are cognitively biased against it

Whittlestone 17 – (Jess Whittlestone, PhD in Behavioural Science and has worked as a policy consultant for government, specialising in security and foreign policy. She also has experience as a freelance journalist for a number of online magazines, including Quartz, Vox, and Aeon. Before her PhD, she studied Maths and Philosophy at Oxford, and played a key role in developing 80,000 Hours' coaching process and research. Currently, Jess is a Postdoctoral Research Associate at the Leverhulme Centre for the Future of Intelligence at Cambridge, “The Long-Term Future”, Effective Altruism, 11-16-17, Available Online at <https://www.effectivealtruism.org/articles/cause-profile-long-run-future/>, accessed 12-4-18, HKR-AM)

The number of people alive today pales in comparison to the number who could exist in the future. It may therefore be extremely important to ensure that human civilization flourishes far into the future, enjoying fulfilling lives free of suffering.

There are a number of ways we might work to ensure a positive future for humanity. We could work to better understand and prevent extinction risks - catastrophic events that have the potential to destroy all life on this planet.[1] We may want to focus on the broader category of existential risks- events that could dramatically and irreversibly curtail humanity’s potential.[2] Or we might focus on increasing the chance that the lives of our descendants are positive in other ways: for example, improving democracy or the ability of institutions to make good decisions.

Attempts to shape the long-term future seem highly neglected relative to the problems we face today. There are fewer incentives to address longer-term problems, and they can also be harder for us to take seriously.

It is, of course, hard to be certain about the impact of our actions on the very long-term future. However, it does seem that there are things we can do - and given the vast scale we are talking about, these actions could therefore have an enormous impact in expectation.

This profile sets out why you might want to focus your altruistic efforts on the long-term future - and why you might not. You may be particularly inclined to focus on this if you think we face serious existential threats in the next century, and if you’re comfortable accepting a reasonable amount of uncertainty about the impact you are having, especially in the short-term.

The case for the long-term future as a target of altruism

The case for focusing on the long-term future can be summarised as follows:

The long-term future has enormous potential for good or evil: our descendants could live for billions or trillions of years, and have very high-quality lives;

It seems likely there are things we can do today that will affect the long-term future in non-negligible ways;

Possible ways of shaping the long-term future are currently highly neglected by individuals and society;

Given points 1 to 3 above, actions aimed at shaping the long-term future seem to have extremely high expected value, higher than any actions aiming for more near-term benefits.

Below we discuss each part of this argument in more detail.

The long-term future has enormous potential

Civilisation could continue for a billion years, until the Earth becomes uninhabitable.[3] It’s hard to say how likely this is, but it certainly seems plausible - and putting less than, say, a 1% chance on this possibility seems overconfident.[4] You may disagree that 1% is a reasonable lower bound here, but changing the figure by an order of magnitude or two would still yield an extremely impressive result. And even if civilisation only survives for another million years, that still amounts to another ~50,000 generations of people, i.e. trillions of future lives.[5]

If our descendants survive for long enough, then they are likely to advance in ways we cannot currently imagine - even someone living a few hundred years ago could not possibly have imagined the technological advances we’ve made today. It is possible they might even develop technology enabling them to reach and colonise planets outside our solar system, and survive well beyond a billion years.[6]

Let’s say that if we survive until the end of the Earth’s lifespan, there is a 1% chance of space colonisation. This would make the overall probability of survival beyond Earth 1 in 10,000 (1% chance of surviving to a billion years, multiplied by a 1% chance of surviving further given that). This sounds incredibly low, but suppose that space colonisation could allow our descendants to survive up to 100 trillion years[7]. This suggests we could have up to 1/10,000 x 100 trillion years = 10 billion expected years of civilisation ahead of us.

If we expect life in the future to be, on average, about as good as the present, then this would make the whole of the future about 100 million times more important than everything that has happened in the last 100 years. In fact, it seems like there could be more people in the future with better lives than those living today: economic, social, and technological progress could enable us to cure diseases, lift people out of poverty, and better solve other problems. It also seems possible that people in the future will be more altruistic than people alive today[8] - which also makes it more likely that they will be motivated to create a happy and valuable world.

However, it’s precisely because of this enormous potential that it’s so important to ensure that things go as well as possible. The loss of potential would be enormous if we end up on a negative trajectory. It could result in a great deal of suffering or the end of life.[9] And just as the potential to solve many of the world’s problems is growing, threats seem to be growing too. In particular, advanced technologies and increasing interconnectedness pose great risks.[10]

There are things we can do today that could affect the long-term future

There are a number of things we could work on today that seem likely to influence the long-term future:

Reducing extinction risks: We could reduce the risk of catastrophic climate change by putting in place laws and regulations to cut carbon emissions. We could reduce the risks from new technologies by investing in research to ensure their safety. Alternatively, we could work to improve global cooperation so that we are better able to deal with unforeseen risks that might arise.

Changing the values of a civilisation: Values tend to be stable in societies,[11] so attempts to shift values, whilst difficult, could have long-lasting effects. Some forms of value change, like increasing altruism, seem robustly good, and may be a way of realizing the very best possible futures. However, spreading poorly considered values could be harmful.

Reducing suffering risks: Historically, technological advances have enabled great welfare improvements (e.g. through modern agriculture and medicine), but also some of the greatest sources of present-day suffering (e.g. factory farming). To prevent the worst risks from new technologies, we could improve global cooperation and work on specific problems like preventing worst-case outcomes from artificial intelligence.

“Speeding up” development: Boosting technological innovation or scientific progress could have a lasting “speed up” effect on the entire future, making all future benefits happen slightly earlier than they otherwise would have. Curing a disease just a few years earlier could save millions of lives, for example. (That said, it’s not clear whether speeding up development is good or bad for existential risk - developing new technologies faster might help us to mitigate certain threats, but pose new risks of their own.)

Ripple effects of our ordinary actions: Improvements in health not only benefit individuals directly but allow them to be more economically successful, meaning that society and other individuals have to invest less in supporting them. In aggregate, this could easily have substantial knock-on effects on the productivity of society, which could affect the future.

Other ways we might create positive trajectory changes: These include improving education, science, and political systems.

Paul Christiano also points out that even if opportunities to shape the long-term future with any degree of certainty do not exist today, they may well exist in the future. Investing in our own current capacity could have an indirect but large impact by improving our ability to take such opportunities when they do arise. Similarly, we can do research today to learn more about how we might be able to impact the long-term future.

The long-term future is neglected, especially relative to its importance

Attempts to shape the long-term future are neglected by individuals, organisations and governments.

One reason is that there is little incentive to focus on far-off, uncertain issues compared to more certain, immediate ones. As 80,000 Hours put it, “Future generations matter, but they can’t vote, they can’t buy things, they can’t stand up for their interests.”

Problems faced by future generations are also more uncertain and more abstract, making it harder for us to care about them. There is a well-established phenomenon called temporal discounting, which means that we tend to give less weight to outcomes that are far in the future. This may explain our tendency to neglect long-term risks and problems. For example, it’s a large part of why we seem to have such difficulty tackling climate change.

Generally, there are diminishing returns to additional work in an area. This means that the neglectedness of the long-term future makes it more likely to be high impact.

Efforts to shape the long-term future could be extremely high in expected value

Even if the chance of our actions influencing the long-term trajectory of humanity is relatively low, there are extremely large potential benefits, which mean that these actions could still have a very high expected value. For example, decreasing the probability of human extinction by just one in a million could result in an additional 1,000 to 10,000 expected years of civilisation (using earlier assumptions).[12]

Compare this to actions we could take to improve the lives of people alive today, without looking at longer-run effects. A dramatic victory such as curing the most common and deadly diseases, or ending all war, might only make the current time period (~100 years) about twice as good as otherwise.[13] Though this seems like an enormous success, given the calculations above, decreasing the probability of human extinction would be 10 or 100 times better in expectation.

We might want to adjust this naive estimate downwards slightly, however, given uncertainty about some of the assumptions that go into it - we could be wrong about the probability of humanity surviving far into the future, or about the value of the future (if we think that future flourishing might have diminishing value, for example.) However, even if we think these estimates should be adjusted downwards substantially, we might very conservatively imagine that reducing the likelihood of existential risk by one in a million only equates to 100 expected years of civilization. This still suggests that the value of working to reduce existential risk is comparable to the value of the biggest victories we could imagine in the current time period - and so well worth taking seriously.

#### 3] Non util ethics are impossible

Greene 07 – Joshua, Associate Professor of Social science in the Department of Psychology at Harvard University (The Secret Joke of Kant’s Soul published in Moral Psychology: Historical and Contemporary Readings, accessed: <https://www.gwern.net/docs/philosophy/ethics/2007-greene.pdf>, pages 47-50)

**What turn-of-the-millennium science** **is telling us is that human moral judgment is not a pristine rational enterprise**, that our **moral judgments are driven by a hodgepodge of emotional dispositions, which themselves were shaped by a hodgepodge of evolutionary forces, both biological and cultural**. **Because of this, it is exceedingly unlikely that there is any rationally coherent normative moral theory that can accommodate our moral intuitions**. Moreover, **anyone who claims to have such a theory**, or even part of one, **almost certainly doesn't**. Instead, what that person probably has is a moral rationalization. It seems then, that we have somehow crossed the infamous "is"-"ought" divide. How did this happen? Didn't Hume (Hume, 1978) and Moore (Moore, 1966) warn us against trying to derive an "ought" from and "is?" How did we go from descriptive scientific theories concerning moral psychology to skepticism about a whole class of normative moral theories? The answer is that we did not, as Hume and Moore anticipated, attempt to derive an "ought" from and "is." That is, our method has been inductive rather than deductive. We have inferred on the basis of the available evidence that the phenomenon of rationalist deontological philosophy is best explained as a rationalization of evolved emotional intuition (Harman, 1977). Missing the Deontological Point I suspect that **rationalist deontologists will remain unmoved by the arguments presented here**. Instead, I suspect, **they** **will insist that I have simply misunderstood what** Kant and like-minded **deontologists are all about**. **Deontology, they will say, isn't about this intuition or that intuition**. It's not defined by its normative differences with consequentialism. **Rather, deontology is about taking humanity seriously**. Above all else, it's about respect for persons. It's about treating others as fellow rational creatures rather than as mere objects, about acting for reasons rational beings can share. And so on (Korsgaard, 1996a; Korsgaard, 1996b). **This is, no doubt, how many deontologists see deontology. But this insider's view**, as I've suggested, **may be misleading**. **The problem**, more specifically, **is that it defines deontology in terms of values that are not distinctively deontological**, though they may appear to be from the inside. **Consider the following analogy with religion. When one asks a religious person to explain the essence of his religion, one often gets an answer like this: "It's about love**, really. It's about looking out for other people, looking beyond oneself. It's about community, being part of something larger than oneself." **This sort of answer accurately captures the phenomenology of many people's religion, but it's nevertheless inadequate for distinguishing religion from other things**. This is because many, if not most, non-religious people aspire to love deeply, look out for other people, avoid self-absorption, have a sense of a community, and be connected to things larger than themselves. In other words, secular humanists and atheists can assent to most of what many religious people think religion is all about. From a secular humanist's point of view, in contrast, what's distinctive about religion is its commitment to the existence of supernatural entities as well as formal religious institutions and doctrines. And they're right. These things really do distinguish religious from non-religious practices, though they may appear to be secondary to many people operating from within a religious point of view. In the same way, I believe that most of **the standard deontological/Kantian self-characterizatons fail to distinguish deontology from other approaches to ethics**. (See also Kagan (Kagan, 1997, pp. 70-78.) on the difficulty of defining deontology.) It seems to me that **consequentialists**, as much as anyone else, **have respect for persons**, **are against treating people as mere objects,** **wish to act for reasons that rational creatures can share, etc**. **A consequentialist respects other persons, and refrains from treating them as mere objects, by counting every person's well-being in the decision-making process**. **Likewise, a consequentialist attempts to act according to reasons that rational creatures can share by acting according to principles that give equal weight to everyone's interests, i.e. that are impartial**. This is not to say that consequentialists and deontologists don't differ. They do. It's just that the real differences may not be what deontologists often take them to be. What, then, distinguishes deontology from other kinds of moral thought? A good strategy for answering this question is to start with concrete disagreements between deontologists and others (such as consequentialists) and then work backward in search of deeper principles. This is what I've attempted to do with the trolley and footbridge cases, and other instances in which deontologists and consequentialists disagree. **If you ask a deontologically-minded person why it's wrong to push someone in front of speeding trolley in order to save five others, you will get** characteristically deontological **answers**. Some **will be tautological**: **"Because it's murder!"** **Others will be more sophisticated: "The ends don't justify the means**." "You have to respect people's rights." **But**, as we know, **these answers don't really explain anything**, because **if you give the same people** (on different occasions) **the trolley case** or the loop case (See above), **they'll make the opposite judgment**, even though their initial explanation concerning the footbridge case applies equally well to one or both of these cases. **Talk about rights, respect for persons, and reasons we can share are natural attempts to explain, in "cognitive" terms, what we feel when we find ourselves having emotionally driven intuitions that are odds with the cold calculus of consequentialism**. Although these explanations are inevitably incomplete, **there seems to be "something deeply right" about them because they give voice to powerful moral emotions**. **But, as with many religious people's accounts of what's essential to religion, they don't really explain what's distinctive about the philosophy in question**.

#### 4] That justifies util – it’s impartial, specific to public actors, and resolves infinite regress which explains all value.

Greene 15 — (Joshua Greene, Professor of Psychology @ Harvard, being interviewed by Russ Roberts, “Joshua Greene on Moral Tribes, Moral Dilemmas, and Utilitarianism”, The Library of Economics and Liberty, 1-5-15, Available Online at <https://www.econtalk.org/joshua-greene-on-moral-tribes-moral-dilemmas-and-utilitarianism/#audio-highlights>, accessed 5-17-20, HKR-AM) \*\*NB: Guest = Greene, and only his lines are highlighted/underlined

Guest: Okay. So, I think utilitarianism is very much misunderstood. And this is part of the reason why we shouldn't even call it utilitarianism at all. We should call it what I call 'deep pragmatism', which I think better captures what I think utilitarianism is really like, if you really apply it in real life, in light of an understanding of human nature. But, we can come back to that. The idea, going back to the tragedy of common-sense morality is you've got all these different tribes with all of these different values based on their different ways of life. What can they do to get along? And I think that the best answer that we have is--well, let's back up. In order to resolve any kind of tradeoff, you have to have some kind of common metric. You have to have some kind of common currency. And I think that what utilitarianism, whether it's the moral truth or not, is provide a kind of common currency. So, what is utilitarianism? It's basically the idea that--it's really two ideas put together. One is the idea of impartiality. That is, at least as social decision makers, we should regard everybody's interests as of equal worth. Everybody counts the same. And then you might say, 'Well, but okay, what does it mean to count everybody the same? What is it that really matters for you and for me and for everybody else?' And there the utilitarian's answer is what is sometimes called, somewhat accurately and somewhat misleadingly, happiness. But it's not really happiness in the sense of cherries on sundaes, things that make you smile. It's really the quality of conscious experience. So, the idea is that if you start with anything that you value, and say, 'Why do you care about that?' and keep asking, 'Why do you care about that?' or 'Why do you care about that?' you ultimately come down to the quality of someone's conscious experience. So if I were to say, 'Why did you go to work today?' you'd say, 'Well, I need to make money; and I also enjoy my work.' 'Well, what do you need your money for?' 'Well, I need to have a place to live; it costs money.' 'Well, why can't you just live outside?' 'Well, I need a place to sleep; it's cold at night.' 'Well, what's wrong with being cold?' 'Well, it's uncomfortable.' 'What's wrong with being uncomfortable?' 'It's just bad.' Right? At some point if you keep asking why, why, why, it's going to come down to the conscious experience--in Bentham's terms, again somewhat misleading, the pleasure and pain of either you or somebody else that you care about. So the utilitarian idea is to say, Okay, we all have our pleasures and pains, and as a moral philosophy we should all count equally. And so a good standard for resolving public disagreements is to say we should go with whatever option is going to produce the best overall experience for the people who are affected. Which you can think of as shorthand as maximizing happiness--although I think that that's somewhat misleading. And the solution has a lot of merit to it. But it also has endured a couple of centuries of legitimate criticism. And one of the biggest criticisms--and now we're getting back to the Trolley cases, is that utilitarianism doesn't adequately account for people's rights. So, take the footbridge case. It seems that it's wrong to push that guy off the footbridge. Even if you stipulate that you can save more people's lives. And so anyone who is going to defend utilitarianism as a meta-morality--that is, a solution to the tragedy of common sense morality, as a moral system to adjudicate among competing tribal moral systems--if you are going to defend it in that way, as I do, you have to face up to these philosophical challenges: is it okay to kill on person to save five people in this kind of situation? So I spend a lot of the book trying to understand the psychology of cases like the footbridge case. And you mention these being kind of unrealistic and weird cases. That's actually part of my defense.

#### War worsens structural inequalities – a] takes away valuable resources to combat issues like economic and social injustice b] war falls the hardest on those who can’t protect themselves – especially nuclear war c] those who fight war are more likely to be worse off socially – aff ballot actively consigns the oppressed to fight for the state d] war kills everyone – death means we literally cannot fight injustice

## Freedom NC

### Framework

#### In setting an end, every agent must recognize freedom as a necessary good, Gewirth 84 bracketed for grammar and gendered language

[Alan Gewirth, () "The Ontological Basis of Natural Law: A Critique and an Alternative" American Journal Of Jurisprudence: Vol. 29: Iss. 1 Article 5, 1984, https://scholarship.law.nd.edu/ajj/vol29/iss1/5/, DOA:9-10-2018 // WWBW Recut LHP AV]

Let me briefly sketch the main line of argument that leads to this conclusion. As I have said, the argument is based on the generic features of human action. To begin with, **every agent acts for purposes [t]he[y] regards as good.** Hence, **[t]he[y] must regard as necessary goods the freedom** and well being **that [is]** are the generic features and **necessary conditions of** his **action** and successful action in general. From this, it follows that **every agent logically must hold or accept** that he has **rights to these conditions**. For if he were **to deny** that he has **these rights**, then he **would** have to **admit that it is permissible** for other persons **to remove** from him the very **conditions** of freedom and well-being **that**, as **an agent**, he **must have**. But **it is contradictory** for him **to hold both that [t]he[y] must have these conditions and also that he may not have them.** Hence, on pain of self-contradiction, every agent must accept that he has rights to freedom and well-being. Moreover, **every agent must further admit that all other agents also have those rights, since all other actual or prospective agents have the same general characteristics of agency** on which he must ground his own right-claims. What I am saying, then, is that every agent, simply by virtue of being an agent, must regard his freedom and well being as necessary goods and must hold that he and all other actual or prospective agents have rights to these necessary goods. Hence, every agent, on pain of self-contradiction, must accept the following principle: Act in accord with the generic rights of your recipients as well as of yourself. The generic rights are rights to the generic features of action, freedom, and well-being. I call this the Principle of Generic Consistency (PGC), because it combines the formal consideration of consistency with the material consideration of the generic features and rights of action.

#### Prefer –

#### A] performativity – argumentation requires the assumption that freedom is good – else agents would be unable to make arguments

#### B] prerequisite – condoning any action requires condoning the freedom required to take that action – so my theory’s a prerequisite to theirs and my offense acts as a side-constraint to your framework.

#### C] culpability – absent a conception of free will, people can just claim they were acting of desires they can’t control.

#### D] probability – it’s logically contradictory to deny my framework because that would use freedom to do so. Therefore, it’s impossible for my framework to be false

#### The universality of freedom justifies a libertarian state. Otteson 09

Otteson 09 brackets in original James R. Otteson (professor of philosophy and economics at Yeshiva University) “Kantian Individualism and Political Libertarianism” The Independent Review, v. 13, n. 3, Winter 2009

In a crucial passage in Metaphysics of Morals, Kant writes that the “Universal Principle of Right” is “‘[e]very action which by itself or by its maxim enables the freedom of each individual’s will to co-exist with the freedom of everyone else in accordance with a universal law is right.’” He concludes, “Thus the universal law of right is as follows: **let your external actions be such that the free application of your will can co-exist with the freedom of everyone in accordance with a universal law**” (1991, 133, emphasis in original).5 **This** stipulation **becomes** for Kant **the grounding justification for the existence of a state**, its raison d’être, and the reason we leave the state of nature is to secure this sphere of maximum freedom compatible with the same freedom of all others. Because this freedom must be complete, in the sense of being as full as possible given the existence of other persons who demand similar freedom, it entails that **the state may**—indeed, must—**secure this condition** of freedom, **but undertake to do nothing else because any other** state **activities** would **compromise** **the** very **autonomy the state seeks to defend**. **Kant’s position** thus outlines and implies a political philosophy that **is broadly libertarian**; that is, **it endorses a state constructed with the sole aim of protecting** its citizens **against invasions of** their **liberty**. For Kant, individuals create a state to protect their moral agency, and in doing so they consent to coercion only insofar as it is required to prevent themselves or others from impinging on their own or others’ agency. In his argument, **individuals cannot rationally consent to a state that instructs them in morals, coerces virtuous behavior, commands them to trade or not, directs their pursuit of happiness, or forcibly requires them to provide for** their own or **others**’ pursuits of happiness. And except in cases of punishment for wrongdoing,6 **this** severe limitation on the scope of the state’s authority **must always be respected**: “The rights of man must be held sacred, however great a sacrifice the ruling power may have to make. There can be no half measures here; it is no use devising hybrid solutions such as a pragmatically conditioned right halfway between right and utility. For all politics must bend the knee before right, although politics may hope in return to arrive, however slowly, at a stage of lasting brilliance” (Perpetual Peace, 1991, 125). The implication is that **a Kantian state protects** against invasions of **freedom and does nothing else**; in the absence of invasions or threats of invasions, it is inactive.

#### Thus, the standard is consistency with a libertarian state.

#### Impact calc – Aggregation fails – there is no one for whom aggregate good is good-for. Korsgaard:

Christine Korsgaard, “The Origin of the Good and Our Animal Nature” Harvard, n.d. RE

According to the second view I will consider, hedonism, the good just is pleasurable experience or consciousness and the absence of painful experience or consciousness. What makes a being capable of having a final good is simply that the being is conscious. Otherwise, its good is not relative to its nature. As is often noticed, on this theory it is a real question whether some of the other animals might not have a better life, or at least be capable of having a better life, than human beings, given their apparent enthusiasm for simple and readily available joys. Although I’ll treat it as a separate theory, hedonism, I believe, has an inherent tendency to collapse either into a version of the intrinsic value theory, or into a version of the third view I am about to describe. Obviously, it is possible to regard hedonism simply as a particular instance of the intrinsic value theory, one that singles out conscious experience as the only possible bearer of intrinsic value. But I think this way of looking at hedonism does not do justice to the intuition that has made hedonism seem plausible to so many thinkers, which is precisely the idea that the final good must have an irreducibly subjective or relational element. That is, what makes hedonism seem plausible is precisely the idea that the final good for a sensate being must be something that can be felt or experienced as a good by that being. It is something that can be perceived or experienced as welcome or positive from the being’s own point of view, and that is therefore relative to the being’s own point of view.9 The intrinsic value version of hedonism tries to capture the essentially subjective element of the final good by attaching objective intrinsic value to a subjective experience, but when this move is made the essentially relational or relative character of subjectivity tends to drop out. The goodness of the experience is detached from its goodness for the being who is having the experience, and instead is located in the character of the experience itself. This defect shows up most clearly in utilitarian versions of hedonism, which allow us to add the goodness of pleasant experiences across the boundaries between persons or between animals. There is no subject for whom the total of these aggregated experiences is a good, so the aggregate good has completely lost that relational character: the goods are detached from the beings from whom they are good. This relational element of value, I believe, is better captured by the third theory I am about to describe.

#### Prefer –

#### 1] Coherence – anything else is either repugnant or infinitely regressive, Boaz 15 bracketed for glang:

David Boaz, executive vice president of the Cato Institute, “The Libertarian Mind: A Manifesto for Freedom”, 2/10/15, <https://books.google.com/books/about/The_Libertarian_Mind.html?id=zs8NBAAAQBAJ>. //LHP AV \*Bracketed for gendered language\*

Any theory of rights has to begin somewhere. Most libertarian philosophers would begin the argument earlier than Jefferson did. **Humans**, unlike animals, come into the world without an instinctive knowledge of what their needs are and how to fulfill them. As Aristotle said, man is a reasoning and deliberating animal; humans use the power of reason to understand their own needs, the world around them, and how to use the world to satisfy their needs. So they **need a social system that allows them to** use their **reason,** to **act** in the world, and to **cooperate with others** to achieve purposes that no one individual could accomplish. Every person is a unique individual. Humans are social animals—we like interacting with others, and we profit from it— **but** **we** think and **act individually**. **Each** individual **owns himself or herself [themselves]**. **What other possibilities** besides self—ownership **are there?**  • **Someone** – a king or a master race – **could own others.** Plato and Aristotle did argue that there were different kinds of humans, some more competent than others and thus endowed with the right and responsibility to rule, just as adults guide children. Some forms of socialism and collectivism are—explicitly or implicitly—-based on the notion that many people are not competent to make decisions about their own lives, so that the more  talented should make decisions for them. **But** that would mean **there were no universal** human **rights,** only rights **that** some haveand others do not**, denying the** essential **humanity of those who are** deemed to be **owned**.  • **Everyone owns everyone**, a fully-fledged communist system. **In such** a system, **before any**one **could** take an **act**ion**, [t]he[y] would need to get permission from everyone** else. **But how could each** other person **grant permission without consulting everyone else**? **You’d have an infinite regress, making any action** at all logically **impossible**. ln practice, since such mutual ownership is impossible, this system would break down into the previous one: some- one, or some group, would own everyone else. That is what happened in the communist states: the party became a dictatorial ruling elite.  Thus, either communism or aristocratic rule would divide the world into factions or classe. **The only possibility** that is humane, logical, and suited to the nature of human beings **is self-ownership**. Obviously, this discussion has only scratched the surface of the question of self-ownership; in any event, I rather like Jefferson’s simple declaration: Natural rights are self-evident.

### Contention

#### Injustice requires someone wronged, but initial acquisition doesn’t violate any entity’s rights– therefore, private appropriation of outer space cannot be unjust, Feser 05:

Edward Feser, [Associate Professor of Philosophy at Pasadena City College] “THERE IS NO SUCH THING AS AN UNJUST INITIAL ACQUISITION,” 2005 //LHP AV

The reason **there is no such thing as an unjust initial acquisition** of resources is that there is no such thing as either a just or an unjust initial acquisition of resources. The concept of **justice**, that is to say, simply **does not apply** to initial acquisition. **It applies only after initial acquisition has already taken place**. In particular, it applies only to transfers of property (and derivatively, to the rectification of injustices in transfer). This, it seems to me, is a clear implication of the assumption (rightly) made by Nozick that **external resources are initially unowned**. Consider the following example. **Suppose** **an individual** **A seeks to acquire some previously unowned resource R**. **For it to be** the case that A commits an **injustice** in acquiring R, it would also have to be the case that **there is some individual** **B** (or perhaps a group of individuals) **against whom A commits the injustice**. **But for B to have been wronged** by A’s acquisi- tion of R, **B would have to have had a rightful claim over R,** **a right to R**. By hypothesis, **however**, **B did not have a right to R, because no one had a right to it—it was unowned, after all**. So B was not wronged and could not have been. In fact, **the very first person who could conceivably be wronged by anyone’s use of R would be, not B, but A himself, since A is the first one to own R**. Such a wrong would in the nature of the case be an injustice in transfer—in unjustly taking from A what is rightfully his—not in initial acquisition. **The same thing, by extension, will be true of all unowned resources: it is only after some- one has initially acquired them that anyone could unjustly come to possess them, via unjust transfer**. It is impossible, then, for there to be any injustices in initial acquisition.7

# Case

## 1nc LEO

#### No debris cascades, but even a worst case is confined to low LEO with no impact

Daniel Von Fange 17, Web Application Engineer, Founder and Owner of LeanCoder, Full Stack, Polyglot Web Developer, “Kessler Syndrome is Over Hyped”, 5/21/2017, http://braino.org/essays/kessler\_syndrome\_is\_over\_hyped/

Kessler Syndrome is overhyped. A chorus of online commenters great any news of upcoming low earth orbit satellites with worry that humanity will to lose access to space. I now think they are wrong.

What is Kessler Syndrome?

Here’s the popular view on Kessler Syndrome. Every once in a while, a piece of junk in space hits a satellite. This single impact destroys the satellite, and breaks off several thousand additional pieces. These new pieces now fly around space looking for other satellites to hit, and so exponentially multiply themselves over time, like a nuclear reaction, until a sphere of man-made debris surrounds the earth, and humanity no longer has access to space nor the benefits of satellites.

It is a dark picture.

Is Kessler Syndrome likely to happen?

I had to stop everything and spend an afternoon doing back-of-the-napkin math to know how big the threat is. To estimate, we need to know where the stuff in space is, how much mass is there, and how long it would take to deorbit.

The orbital area around earth can be broken down into four regions.

Low LEO - Up to about 400km. Things that orbit here burn up in the earth’s atmosphere quickly - between a few months to two years. The space station operates at the high end of this range. It loses about a kilometer of altitude a month and if not pushed higher every few months, would soon burn up. For all practical purposes, Low LEO doesn’t matter for Kessler Syndrome. If Low LEO was ever full of space junk, we’d just wait a year and a half, and the problem would be over.

High LEO - 400km to 2000km. This where most heavy satellites and most space junk orbits. The air is thin enough here that satellites only go down slowly, and they have a much farther distance to fall. It can take 50 years for stuff here to get down. This is where Kessler Syndrome could be an issue.

Mid Orbit - GPS satellites and other navigation satellites travel here in lonely, long lives. The volume of space is so huge, and the number of satellites so few, that we don’t need to worry about Kessler here.

GEO - If you put a satellite far enough out from earth, the speed that the satellite travels around the earth will match the speed of the surface of the earth rotating under it. From the ground, the satellite will appear to hang motionless. Usually the geostationary orbit is used by big weather satellites and big TV broadcasting satellites. (This apparent motionlessness is why satellite TV dishes can be mounted pointing in a fixed direction. You can find approximate south just by looking around at the dishes in your northern hemisphere neighborhood.) For Kessler purposes, GEO orbit is roughly a ring 384,400 km around. However, all the satellites here are moving the same direction at the same speed - debris doesn’t get free velocity from the speed of the satellites. Also, it’s quite expensive to get a satellite here, and so there aren’t many, only about one satellite per 1000km of the ring. Kessler is not a problem here.

How bad could Kessler Syndrome in High LEO be?

Let’s imagine a worst case scenario.

An evil alien intelligence chops up everything in High LEO, turning it into 1cm cubes of death orbiting at 1000km, spread as evenly across the surface of this sphere as orbital mechanics would allow. Is humanity cut off from space?

I’m guessing the world has launched about 10,000 tons of satellites total. For guessing purposes, I’ll assume 2,500 tons of satellites and junk currently in High LEO. If satellites are made of aluminum, with a density of 2.70 g/cm3, then that’s 839,985,870 1cm cubes. A sphere for an orbit of 1,000km has a surface area of 682,752,000 square KM. So there would be one cube of junk per .81 square KM. If a rocket traveled through that, its odds of hitting that cube are tiny - less than 1 in 10,000.

So even in the worst case, we don’t lose access to space.

Now though you can travel through the debris, you couldn’t keep a satellite alive for long in this orbit of death. Kessler Syndrome at its worst just prevents us from putting satellites in certain orbits.

In real life, there’s a lot of factors that make Kessler syndrome even less of a problem than our worst case though experiment.

* Debris would be spread over a volume of space, not a single orbital surface, making collisions orders of magnitudes less likely.
* Most impact debris will have a slower orbital velocity than either of its original pieces - this makes it deorbit much sooner.
* Any collision will create large and small objects. Small objects are much more affected by atmospheric drag and deorbit faster, even in a few months from high LEO. Larger objects can be tracked by earth based radar and avoided.
* The planned big new constellations are not in High LEO, but in Low LEO for faster communications with the earth. They aren’t an issue for Kessler.
* Most importantly, all new satellite launches since the 1990’s are required to include a plan to get rid of the satellite at the end of its useful life (usually by deorbiting)

So the realistic worst case is that insurance premiums on satellites go up a bit. Given the current trend toward much smaller, cheaper micro satellites, this wouldn’t even have a huge effect.

I’m removing Kessler Syndrome from my list of things to worry about.

#### It takes centuries and adaptation solves

Ted Muelhaupt 19, Associate Principal Director of the Systems Analysis and Simulation Subdivision (SASS) and Manager of the Center for Orbital and Reentry Debris Studies at The Aerospace Corporation, M.S., B.S. Aerospace and Aeronautical Engineering & Mechanics, University of Minnesota - Twin Cities, Senior Member of the American Institute of Aeronautics and Astronautics, “How Quickly Would It Take For the Kessler Syndrome To Destroy All The Satellites In LEO? And Could You See This Happening From Earth?”, Quora, 2/28/2019, https://www.quora.com/How-quickly-would-it-take-for-the-Kessler-Syndrome-to-destroy-all-the-satellites-in-LEO-And-could-you-see-this-happening-from-Earth

The dynamics of the Kessler Syndrome are real, and most people studying it agree on the concept: if there is sufficient density of objects and mass, a chain reaction of debris breaking up objects and creating more debris can occur. But the timescale of this process takes decades and centuries. There are many assumptions that go into these models. Though there is still argument about this, many people in the field think that the process is already underway in low earth orbit. But others, including myself, think we can stop it if we take action. This is a slow motion disaster that we can prevent.

But in spite of hype to the contrary, we will never “lose access to space”. Certain missions may become impractical or too expensive, and we may decide that some orbits are too risky for humans. Even that depends on the tolerance for the risk. But robots don’t have mothers, and if we feel it is worthwhile we will take the risk and fly the satellites where we need to.

To the specifics of the question, it will take many decades. It will not destroy all satellites in LEO. You won’t be able to see it from the ground unless you were extraordinarily lucky, and you happened to see a flash from a collision in the instant you were looking, with just the right lighting.

#### Squo tracking, shielding, and removal plans solve

Dr. Brian Koberlein 16, Professor of Physics at the Rochester Institute of Technology and PhD in Astrophysics from the University of Connecticut, “Cascade Effect”, 5-4, https://archive.briankoberlein.com/2016/05/04/cascade-effect/index.html

In the movie Gravity the driving force of the plot is a catastrophic cascade of space debris. An exploding satellite sends high speed debris into the path of other satellites, and the resulting collisions create more space debris until everything from a space shuttle to the International Space Station faces an eminent threat of destruction. Not unexpectedly, the movie portrayal of such a situation is not particularly accurate, but the risk of a debris cascade is very real.

It’s known as the Kessler syndrome, after Donald Kessler, who first imagined the scenario in the 1970s. The problem comes down to the fact that small objects in Earth orbit can stay in orbit for a very long time. If an astronaut drops a bolt, it can stay in orbit for decades or centuries. Because the relative speed of two objects in orbit can be quite large, it doesn’t take a big object to pose a real threat to your spacecraft. On the highway a small pebble can chip your car windshield. In space it can be done by a chip of paint traveling at thousands of kilometers per hour. In the history of the space shuttle missions, there were more than 1,600 debris strikes. Because of such strikes, more than 90 space shuttle windows had to be replaced over the lifetime of shuttle missions.

While that might sound alarming, it’s actually quite manageable. Upgrades and maintenance were quite common on the shuttle missions, and we tend to err on the side of caution when it comes to replacing parts. Modern spacecraft also have ways to mitigate the risk of small impacts, such as Whipple shields made of thin layers of material spaced apart so that objects disintegrate when hitting the shield rather than the spacecraft itself. We also have a tracking system that currently tracks more than 300,000 objects bigger than 1 cm, so we can make sure that most spacecraft avoid these objects.

But the risk of big collisions isn’t negligible. In 2009 the Iridium 33 and Kosmos-2251 satellites collided at high speed, destroying both spacecraft and creating more dangerous debris. It wouldn’t take many collisions like this for the debris numbers to rise dramatically, and more debris means a greater risk of collisions. In Gravity the cascade happens very quickly, triggered by a single event. The reality is not quite so grave. Instead of happening overnight, Kessler syndrome would occur gradually, raising collision risks to the point where certain orbits become logistically impractical. It could occur so gradually that we might not notice it early on, and there are some that argue it’s already underway.

The good news is that we’re aware of the threat. And, as the old saying goes, knowing is half the battle. Already we take steps to limit the amount of debris created. New spacecraft include end of life plans to remove them from orbit, either by sending them into Earths atmosphere to burn up, or sending them to a “graveyard orbit” that poses little risk to other spacecraft. There are also plans on the drawing board to clear orbits of debris, particularly in low-Earth orbit where the risk is greatest. The cascade effect is a real risk, but it’s also one we can likely manage with a bit of ingenuity.

#### Monitoring networks are robust and ensure no collisions

Dave Mosher 9-3, Deputy Editor of Science Coverage and Senior Correspondent at Business Insider, Former Contributor at Wired, “Satellite Collisions May Trigger A Space-Junk Disaster That Could End Human Access To Orbit. Here's How.”, Business Insider, 9/3/2019, https://www.businessinsider.com/space-junk-kessler-syndrome-chain-reaction-prevention-2018-3

The Kessler syndrome plays center-stage in the movie "Gravity," in which an accidental space collision endangers a crew aboard a large space station. But Gossner said that type of a runaway space-junk catastrophe is unlikely.

"Right now I don't think we're close to that," he said. "I'm not saying we couldn't get there, and I'm not saying we don't need to be smart and manage the problem. But I don't see it ever becoming, anytime soon, an unmanageable problem."

There is no current system to remove old satellites or sweep up bits of debris in order to prevent a Kessler event. Instead, space debris is monitored from Earth, and new rules require satellites in low-Earth orbit be deorbited after 25 years so they don't wind up adding more space junk.

"Our current plan is to manage the problem and not let it get that far," Gossner said. "I don't think that we're even close to needing to actively remove stuff. There's lots of research being done on that, and maybe some day that will happen, but I think that — at this point, and in my humble opinion — an unnecessary expense."

A major part of the effort to prevent a Kessler event is the Space Surveillance Network (SSN). The project, led by the US military, uses 30 different systems around the world to identify, track, and share information about objects in space.

Many objects are tracked day and night via a network of radar observatories around the globe.

Optical telescopes on the ground also keep an eye out, but they aren't always run by the government. "The commercial sector is actually putting up lots and lots of telescopes," Gossner said. The government pays for their debris-tracking services.

Gossner said one major debris-tracking company is called Exoanalytic. It uses about 150 small telescopes set up around the globe to detect, track, and report space debris to the SSN.

Telescopes in space track debris, too. Far less is known about them because they're likely top-secret military satellites.

Objects detected by the government and companies get added to a catalog of space debris and checked against the orbits of other known bits of space junk. New orbits are calculated with supercomputers to see if there's a chance of any collisions.

Diana McKissock, a flight lead with the US Air Force's 18th Space Control Squadron, helps track space debris for the SSN. She said the surveillance network issues warnings to NASA, satellite companies, and other groups with spacecraft, based on two levels of emergency: basic and advanced.

The SSN issues a basic emergency report to the public three days ahead of a 1-in-10,000 chance of a collision. It then provides multiple updates per day until the risk of a collision passes.

To qualify for such reporting, a rogue object must come within a certain distance of another object. In low-Earth orbit, that distance must be less than 1 kilometer (0.62 mile); farther out in deep space, where the precision of orbits is less reliable, the distance is less than 5 kilometers (3.1 miles).

Advanced emergency reports help satellite providers see possible collisions much more than three days ahead. "In 2017, we provided data for 308,984 events, of which only 655 were emergency-reportable," McKissock told Business Insider in an email. Of those, 579 events were in low-Earth orbit (where it's relatively crowded with satellites).

When a space company receives a SSN alert, they typically move their satellite into a different orbit — and out of harm's way — by burning a little propellant.

Although companies like SpaceX are launching more and more objects into space, McKissock said "our everyday concern isn’t something as catastrophic as the Kessler syndrome."

d to vacuum instead of allowing fuels to stew for years. SpaceX has its upper stages de-orbit most of the time.

## 1nc Space Escalation

#### No retal or escalation from satellite attacks

Eric J. Zarybnisky 18, MA in National Security Studies from the Naval War College, PhD in Operations Research from the MIT Sloan School of Management, Lt Col, USAF, “Celestial Deterrence: Deterring Aggression in the Global Commons of Space”, 3/28/2018, https://apps.dtic.mil/dtic/tr/fulltext/u2/1062004.pdf

PREVENTING AGGRESSION IN SPACE

While deterrence and the Cold War are strongly linked in the public’s mind through the nuclear standoff between the United States and the Soviet Union, the fundamentals of deterrence date back millennia and deterrence remains relevant. Thucydides alludes to the concept of deterrence in his telling of the Peloponnesian War when he describes rivals seeking advantages, such as recruiting allies, to dissuade an adversary from starting or expanding a conflict.6F6 Aggression in space was successfully avoided during the Cold War because both sides viewed an attack on military satellites as highly escalatory, and such an action would likely result in general nuclear war.7F7 In today’s more nuanced world, attacking satellites, including military satellites, does not necessarily result in nuclear war. For instance, foreign countries have used high-powered lasers against American intelligence-gathering satellites8F8 and the United States has been reluctant to respond, let alone retaliate with nuclear weapons. This shift in policy is a result of the broader use of gray zone operations, to which countries struggle to respond while limiting escalation. Beginning with the fundamentals of deterrence illuminates how it applies to prevention of aggression in space.

## Impact D – Miscalc

#### No miscalc or escalation

James Pavur 19, Professor of Computer Science Department of Computer Science at Oxford University and Ivan Martinovic, DPhil Researcher Cybersecurity Centre for Doctoral Training at Oxford University, “The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space”, 2019 11th International Conference on Cyber Conflict: Silent Battle T. Minárik, S. Alatalu, S. Biondi, M. Signoretti, I. Tolga, G. Visky (Eds.), <https://ccdcoe.org/uploads/2019/06/Art_12_The-Cyber-ASAT.pdf>

A. Limited Accessibility Space is difficult. Over 60 years have passed since the first Sputnik launch and only nine countries (ten including the EU) have orbital launch capabilities. Moreover, a launch programme alone does not guarantee the resources and precision required to operate a meaningful ASAT capability. Given this, one possible reason why space wars have not broken out is simply because only the US has ever had the ability to fight one [21, p. 402], [22, pp. 419–420]. Although launch technology may become cheaper and easier, it is unclear to what extent these advances will be distributed among presently non-spacefaring nations. Limited access to orbit necessarily reduces the scenarios which could plausibly escalate to ASAT usage. Only major conflicts between the handful of states with ‘space club’ membership could be considered possible flashpoints. Even then, the fragility of an attacker’s own space assets creates de-escalatory pressures due to the deterrent effect of retaliation. Since the earliest days of the space race, dominant powers have recognized this dynamic and demonstrated an inclination towards de-escalatory space strategies [23]. B. Attributable Norms There also exists a long-standing normative framework favouring the peaceful use of space. The effectiveness of this regime, centred around the Outer Space Treaty (OST), is highly contentious and many have pointed out its serious legal and political shortcomings [24]–[26]. Nevertheless, this status quo framework has somehow supported over six decades of relative peace in orbit. Over these six decades, norms have become deeply ingrained into the way states describe and perceive space weaponization. This de facto codification was dramatically demonstrated in 2005 when the US found itself on the short end of a 160-1 UN vote after opposing a non-binding resolution on space weaponization. Although states have occasionally pushed the boundaries of these norms, this has typically occurred through incremental legal re-interpretation rather than outright opposition [27]. Even the most notable incidents, such as the 2007-2008 US and Chinese ASAT demonstrations, were couched in rhetoric from both the norm violators and defenders, depicting space as a peaceful global commons [27, p. 56]. Altogether, this suggests that states perceive real costs to breaking this normative tradition and may even moderate their behaviours accordingly. One further factor supporting this norms regime is the high degree of attributability surrounding ASAT weapons. For kinetic ASAT technology, plausible deniability and stealth are essentially impossible. The literally explosive act of launching a rocket cannot evade detection and, if used offensively, retaliation. This imposes high diplomatic costs on ASAT usage and testing, particularly during peacetime. C. Environmental Interdependence A third stabilizing force relates to the orbital debris consequences of ASATs. China’s 2007 ASAT demonstration was the largest debris-generating event in history, as the targeted satellite dissipated into thousands of dangerous debris particles [28, p. 4]. Since debris particles are indiscriminate and unpredictable, they often threaten the attacker’s own space assets [22, p. 420]. This is compounded by Kessler syndrome, a phenomenon whereby orbital debris ‘breeds’ as large pieces of debris collide and disintegrate. As space debris remains in orbit for hundreds of years, the cascade effect of an ASAT attack can constrain the attacker’s long-term use of space [29, pp. 295– 296]. Any state with kinetic ASAT capabilities will likely also operate satellites of its own, and they are necessarily exposed to this collateral damage threat. Space debris thus acts as a strong strategic deterrent to ASAT usage.

#### Accidental war or miscalc is impossible

--self-deterrence – basic assumption of survival interest doesn’t require assumption of broader rationality

--opportunity for revising judgments – can “undo” escalation

--physical safeguards – Permissive Action Locks

--organizational checks – layers of communication and control double-checks

--overwhelming empirics – hundreds of near-accidents demonstrate safety, not risk

Michael **Quinlan 9**. Distinguished Former British Defence Strategist and Former Permanent Under-Secretary of State. 2009. “Thinking About Nuclear Weapons.” p. 63-69

Even if initial nuclear use did not quickly end the fighting, the supposition of inexorable momentum in a developing exchange, with each side rushing to overreaction amid confusion and uncertainty, is implausible. It fails to consider what the situation of the decisionmakers would really be. Neither side could want escalation. Both would be appalled at what was going on. Both would be desperately looking for signs that the other was ready to call a halt. Both, given the capacity for evasion or concealment which modern delivery platforms and vehicles can possess, could have in reserve significant forces invulnerable enough not to entail use-or-lose pressures. (It may be more open to question, as noted earlier, whether newer nuclear-weapon possessors can be immediately in that position; but it is within reach of any substantial state with advanced technological capabilities, and attaining it is certain to be a high priority in the development of forces.) As a result, neither side can have any predisposition to suppose, in an ambiguous situation of fearful risk, that the right course when in doubt is to go on copiously launching weapons. And none of this analysis rests on any presumption of highly subtle or pre-concerted rationality. The rationality required is plain. The argument is reinforced if we consider the possible reasoning of an aggressor at a more dispassionate level. Any substantial nuclear armoury can inflict destruction outweighing any possible prize that aggression could hope to seize. A state attacking the possessor of such an armoury must therefore be doing so (once given that it cannot count upon destroying the armoury pre-emptively) on a judgement that the possessor would be found lacking in the will to use it. If the attacked possessor used nuclear weapons, whether first or in response to the aggressor's own first use, this judgement would begin to look dangerously precarious. There must be at least a substantial possibility of the aggressor leaders' concluding that their initial judgement had been mistaken—that the risks were after all greater than whatever prize they had been seeking, and that for their own country's survival they must call off the aggression. Deterrence planning such as that of NATO was directed in the first place to preventing the initial misjudgement and in the second, if it were nevertheless made, to compelling such a reappraisal. The former aim had to have primacy, because it could not be taken for granted that the latter was certain to work. But there was no ground for assuming in advance, for all possible scenarios, that the chance of its working must be negligible. An aggressor state would itself be at huge risk if nuclear war developed, as its leaders would know. It may be argued that a policy which abandons hope of physically defeating the enemy and simply hopes to get him to desist is pure gamble, a matter of who blinks first; and that the political and moral nature of most likely aggressors, almost ex hypothesis, makes them the less likely to blink. One response to this is to ask what is the alternative—it can only be surrender. But a more positive and hopeful answer lies in the fact that the criticism is posed in a political vacuum. Real-life conflict would have a political context. The context which concerned NATO during the cold war, for example, was one of defending vital interests against a postulated aggressor whose own vital interests would not be engaged, or would be less engaged. Certainty is not possible, but a clear asymmetry of vital interest is a legitimate basis for expecting an asymmetry, credible to both sides, of resolve in conflict. That places upon statesmen, as page 23 has noted, the key task in deterrence of building up in advance a clear and shared grasp of where limits lie. That was plainly achieved in cold-war Europe. 11 vital interests have been defined in a way that is clear, and also clearly not overlapping or incompatible with those of the adversary, a credible basis has been laid for the likelihood of greater resolve in resistance. It was also sometimes suggested by critics that whatever might be indicated by theoretical discussion of political will and interests, the military environment of nuclear warfare—particularly difficulties of communication and control—would drive escalation with overwhelming probability to the limit. But it is obscure why matters should be regarded as inevitably so for every possible level and setting of action. Even if the history of war suggested (as it scarcely does) that military decision-makers are mostly apt to work on the principle 'When in doubt, lash out', the nuclear revolution creates an utterly new situation. The pervasive reality, always plain to both sides during the cold war, is 'If this goes on to the end, we are all ruined'. Given that inexorable escalation would mean catastrophe for both, it would be perverse to suppose them permanently incapable of framing arrangements which avoid it. As page 16 has noted, NATO gave its military commanders no widespread delegated authority, in peace or war, to launch nuclear weapons without specific political direction. Many types of weapon moreover had physical safeguards such as PALs incorporated to reinforce organizational ones. There were multiple communication and control systems for passing information, orders, and prohibitions. Such systems could not be totally guaranteed against disruption if at a fairly intense level of strategic exchange—which was only one of many possible levels of conflict— an adversary judged it to be in his interest to weaken political control. It was far from clear why he necessarily should so judge. Even then, however, it remained possible to operate on a general fail-safe presumption: no authorization, no use. That was the basis on which NATO operated. If it is feared that the arrangements which a nuclear-weapon possessor has in place do not meet such standards in some respects, the logical course is to continue to improve them rather than to assume escalation to be certain and uncontrollable, with all the enormous inferences that would have to flow from such an assumption. The likelihood of escalation can never be 100 per cent, and never zero. Where between those two extremes it may lie can never be precisely calculable in advance; and even were it so calculable, it would not be uniquely fixed—it would stand to vary hugely with circumstances. That there should be any risk at all of escalation to widespread nuclear war must be deeply disturbing, and decision-makers would always have to weigh it most anxiously. But a pair of key truths about it need to be recognized. The first is that the risk of escalation to large-scale nuclear war is inescapably present in any significant armed conflict between nuclear-capable powers, whoever may have started the conflict and whoever may first have used any particular category of weapon. The initiator of the conflict will always have physically available to him options for applying more force if he meets effective resistance. If the risk of escalation, whatever its degree of probability, is to be regarded as absolutely unacceptable, the necessary inference is that a state attacked by a substantial nuclear power must forgo military resistance. It must surrender, even if it has a nuclear armoury of its own. But the companion truth is that, as page 47 has noted, the risk of escalation is an inescapable burden also upon the aggressor. The exploitation of that burden is the crucial route, if conflict does break out, for managing it to a tolerable outcome—the only route, indeed, intermediate between surrender and holocaust, and so the necessary basis for deterrence beforehand. The working out of plans to exploit escalation risk most effectively in deterring potential aggression entails further and complex issues. It is for example plainly desirable, wherever geography, politics, and available resources so permit without triggering arms races, to make provisions and dispositions that are likely to place the onus of making the bigger and more evidently dangerous steps in escalation upon the aggressor who wishes to maintain his attack, rather than upon the defender. (The customary shorthand for this desirable posture used to be 'escalation dominance'.) These issues are not further discussed here. But addressing them needs to start from acknowledgement that there are in any event no certainties or absolutes available, no options guaranteed to be risk-free and cost-free. Deterrence is not possible without escalation risk; and its presence can point to no automatic policy conclusion save for those who espouse outright pacifism and accept its consequences. Accident and Miscalculation Ensuring the safety and security of nuclear weapons plainly needs to be taken most seriously. Detailed information is understandably not published, but such direct evidence as there is suggests that it always has been so taken in every possessor state, with the inevitable occasional failures to follow strict procedures dealt with rigorously. Critics have nevertheless from time to time argued that the possibility of accident involving nuclear weapons is so substantial that it must weigh heavily in the entire evaluation of whether war-prevention structures entailing their existence should be tolerated at all. Two sorts of scenario are usually in question. The first is that of a single grave event involving an unintended nuclear explosion—a technical disaster at a storage site, for example, or the accidental or unauthorized launch of a delivery system with a live nuclear warhead. The second is that of some event—perhaps such an explosion or launch, or some other mishap such as malfunction or misinterpretation of radar signals or computer systems—initiating a sequence of response and counter-response that culminated in a nuclear exchange which no one had truly intended. No event that is physically possible can be said to be of absolutely zero probability (just as at an opposite extreme it is absurd to claim, as has been heard from distinguished figures, that nuclear-weapon use can be guaranteed to happen within some finite future span despite not having happened for over sixty years). But human affairs cannot be managed to the standard of either zero or total probability. We have to assess levels between those theoretical limits and weigh their reality and implications against other factors, in security planning as in everyday life. There have certainly been, across the decades since 1945, many known accidents involving nuclear weapons, from transporters skidding off roads to bomber aircraft crashing with or accidentally dropping the weapons they carried (in past days when such carriage was a frequent feature of readiness arrangements—it no longer is). A few of these accidents may have released into the nearby environment highly toxic material. None however has entailed a nuclear detonation. Some commentators suggest that this reflects bizarrely good fortune amid such massive activity and deployment over so many years. A more rational deduction from the facts of this long experience would however be that the probability of any accident triggering a nuclear explosion is extremely low. It might be further noted that the mechanisms needed to set off such an explosion are technically demanding, and that in a large number of ways the past sixty years have seen extensive improvements in safety arrangements for both the design and the handling of weapons. It is undoubtedly possible to see respects in which, after the cold war, some of the factors bearing upon risk may be new or more adverse; but some are now plainly less so. The years which the world has come through entirely without accidental or unauthorized detonation have included early decades in which knowledge was sketchier, precautions were less developed, and weapon designs were less ultra-safe than they later became, as well as substantial periods in which weapon numbers were larger, deployments more widespread and diverse, movements more frequent, and several aspects of doctrine and readiness arrangements more tense. Similar considerations apply to the hypothesis of nuclear war being mistakenly triggered by false alarm. Critics again point to the fact, as it is understood, of numerous occasions when initial steps in alert sequences for US nuclear forces were embarked upon, or at least called for, by indicators mistaken or misconstrued. In none of these instances, it is accepted, did matters get at all near to nuclear launch—extraordinary good fortune again, critics have suggested. But the rival and more logical inference from hundreds of events

stretching over sixty years of experience presents itself once more: that the probability of initial misinterpretation leading far towards mistaken launch is remote. Precisely because any nuclear-weapon possessor recognizes the vast gravity of any launch, release sequences have many steps, and human decision is repeatedly interposed as well as capping the sequences. To convey that because a first step was prompted the world somehow came close to accidental nuclear war is wild hyperbole, rather like asserting, when a tennis champion has lost his opening service game, that he was nearly beaten in straight sets. History anyway scarcely offers any ready example of major war started by accident even before the nuclear revolution imposed an order-of-magnitude increase in caution. It was occasionally conjectured that nuclear war might be triggered by the real but accidental or unauthorized launch of a strategic nuclear-weapon delivery system in the direction of a potential adversary. No such launch is known to have occurred in over sixty years. The probability of it is therefore very low. But even if it did happen, the further hypothesis of its initiating a general nuclear exchange is far-fetched. It fails to consider the real situation of decision-makers, as pages 63-4 have brought out. The notion that cosmic holocaust might be mistakenly precipitated in this way belongs to science fiction.

#### No miscalc or escalation

James Pavur 19, Professor of Computer Science Department of Computer Science at Oxford University and Ivan Martinovic, DPhil Researcher Cybersecurity Centre for Doctoral Training at Oxford University, “The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space”, 2019 11th International Conference on Cyber Conflict: Silent Battle T. Minárik, S. Alatalu, S. Biondi, M. Signoretti, I. Tolga, G. Visky (Eds.), <https://ccdcoe.org/uploads/2019/06/Art_12_The-Cyber-ASAT.pdf>

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## Earth mining worse

#### Earth mining kills the environment.

Williams 19 Matthew S Williams 8-1-2019 “Asteroid Mining: What Will It Involve and Is This the Future of Wealth?” <https://interestingengineering.com/asteroid-mining-what-will-it-involve-and-is-this-the-future-of-wealth> (writer at Universe Today)//Elmer

Of course, this raises the obvious question: wouldn't it be really expensive to do all this mining? Why not simply continue to rely on Earth for sources of precious metals and resources and simply learn to use them better? To put it simply, we are running out of resources. To be clear, learning to use our resources better and more sustainably is always a great idea. And while it is certainly true than Earth-based mining is far cheaper than going to space would be, that may not be the case indefinitely. Aside from the fact that off-world minerals and ices would be of considerable value to Earth's economy, there is also the way that growing consumption is leading our reserves to become slowly exhausted. In fact, according to some estimates, it is possible that our planet will run out of key elements that are needed for modern industry and food production within the next 50 to 60 years. This alone is a pretty good incentive to tap the virtually inexhaustible supply of elements located off-world. Plus, there are a lot of benefits to expanding humanity's resource base beyond Earth. Here on Earth, mining takes a considerable toll on the natural environment. In fact, depending on the methods used, it can result in erosion, sinkholes, habitat destruction, and the destruction of native animal and plant life. There's also the dangers of toxic runoff and the contamination of soil, groundwater, and surface water, which is a danger to humans, as well as to wildlife and the natural environment. As for smelting, machining, and manufacturing, the environmental damage that results is well-documented. Combined with power generation, these industrial processes are one of the leading contributors to air, water, and pollution. By shifting these burdens off-world, humanity could dramatically-reduce the impact it has on the natural environment.

## 1nc Russia-China Alliance/SATs

#### No one’s going to war over a downed satellite

Bowen 18 [Bleddyn Bowen, Lecturer in International Relations at the University of Leicester. The Art of Space Deterrence. February 20, 2018. https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/]

Space is often an afterthought or a miscellaneous ancillary in the grand strategic views of top-level decision-makers. A president may not care that one satellite may be lost or go dark; it may cause panic and Twitter-based hysteria for the space community, of course. But the terrestrial context and consequences, as well as the political stakes and symbolism of any exchange of hostilities in space matters more. The political and media dimension can magnify or minimise the perceived consequences of losing specific satellites out of all proportion to their actual strategic effect.

#### Won’t go nuclear – seen as a normal conventional attack because of integration with ground forces

Firth 7/1/19 [News Editor at MIT Technology Review, was Chief News Editor at New Scientist. How to fight a war in space (and get away with it). July 1, 2019. MIT Technology Review]

Space is so intrinsic to how advanced militaries fight on the ground that an attack on a satellite need no longer signal the opening shot in a nuclear apocalypse. As a result, “deterrence in space is less certain than it was during the Cold War,” says Todd Harrison, who heads the Aerospace Security Project at CSIS, a think tank in Washington, DC. Non-state actors, as well as more minor powers like North Korea and Iran, are also gaining access to weapons that can bloody the noses of much larger nations in space.

## 1nc Fracking

#### Satellite loss shuts down global fracking

Les Johnson 13, Deputy Manager for NASA's Advanced Concepts Office at the Marshall Space Flight Center, Co-Investigator for the JAXA T-Rex Space Tether Experiment and PI of NASA's ProSEDS Experiment, Master's Degree in Physics from Vanderbilt University, Popular Science Writer, and NASA Technologist, Frequent Contributor to the Journal of the British Interplanetary Sodety and Member of the American Institute of Aeronautics and Astronautics, National Space Society, the World Future Society, and MENSA, Sky Alert!: When Satellites Fail, p. 99-105

Energy, environment, farming, mining, land use. All of these areas and more are now inextricably linked to satellite data and would be devastated should that flow of data stop.

Environmental Monitoring

Oh how complacent we've become. We take for granted that we will have instant images from space showing a volcanic eruption somewhere in the South Pacific within hours of learning that it happened. When the BP oll spill happened in the Gulf of Mexico in 2010, satellite images were used in conjunction with aircraft and ships to monitor the extent and evolving nature of the spill (Figures 10.1 and 10.2).

The data were also used to direct the ships that were attempting to clean up the spill, to warn fishermen of areas in which it would be dangerous to fish, and to generally monitor the extent of the disaster. This is the type of data we get from space in a field known as remote sensing.

Remote sensing is, well, exactly what its name implies. With it, you gather data, or sense, usually in the form of electromagnetic radiation (light), remotely - that is, you are not physically touching what you are looking at. Satellite remote sensing began shortly after we began launching satellites and many industries are now totally dependent upon having the capability.

We use satellites, like the venerable Landsat series, to study the Earth m unprecedented detail. Since 1972, Landsat satellites have taken millions of high resolution images of the Earth's surface, allowing comprehensive studies of how the land has changed due to human intervention (deforestation, agriculture, settlement, etc.) and natural processes (desertification, floods, etc.).

The best way to understand how useful Landsat and similar data can be to governments at all levels is best illustrated by looking at 14then and now" photographs. For example, Africa's Lake Chad has been shrinking for 40 years, as the desert has encroached on this once plentiful inland freshwater lake. Forty years ago, there were about 15,000 square miles of water within the lake. Now, it is less than 500 square miles (Figure 10.3) [1].

And what is the practical side of this particular bit of information?

Governments use this type of satellite imagery to avoid human tragedy. Hundreds of thousands of people, if not millions, depend upon the waters of Lake Chad for agriculture, industry, and personal hygiene. With the lake going dry, how has this impacted on their livelihoods, their families, and their very lives?

The European Space Agency (ESA) is freely providing satellite data to developing countries as they search for new sources of drinking water. For example, ESA assessed data obtained from space over Nigeria to find over 90 new freshwater sources within that country. After ground teams visited the new sites, all were confirmed to contain fresh water. This was no accident. These were satellites with sensors developed for just such purposes in mind [2].

Desertification is but one example of changing climates affecting people's everyday lives. What about more direct observations of our impact on the planet? Figures 10.4 and 10.5 show the scarring of the Earth's surface as a result of surface mining in West Virginia. This is not a polemic against mining; rather, it is an observation that we can use satellite imagery to monitor such mining and be mindful of its impact on the environment.

Other than taking pictures of surface features, like lakes and open pit mines, how are satellites monitoring the Earth's changing climate? In just about every way, by: monitoring global land, sea, and atmospheric temperatures; measuring yearly average rainfall amounts just about everywhere on the globe; measuring glaciation rates; measuring sea surface heights; and more. Remote sensing is more than taking pictures of the Earth in the visible part of the spectrum. We can learn a great deal from looking at part of the spectrum that our eyes cannot see - but our instruments can.

Shown in Figure 10.6 is a composite image of the Earth's surface showing the average land-surface temperature at night. The data came from two NASA satellites, Terra and Aqua, as they orbit the Earth in a polar orbit. (This means that they circle the Earth from top to bottom, passing over both the North and South Poles with each complete orbit.) Terra's orbit is such that it passes from the north to the south across the equator in the morning; Aqua passes south to north over the equator in the afternoon. Taken together, they observe the Earth's surface in its entirety every two days. Data sets such as this exist for just about any day of the year and can show either night-time lows or daytime highs.

By looking in different parts of the spectrum, like the infrared light discussed above, we can make observations as described in Table 10.1.

Pollution Monitoring

As emerging countries industrialize, they also become polluters. Many of these countries are not exactly forthright about releasing air-pollution details to the media, so much of our awareness of the rising pollution there is anecdotal - typically m the form of stories told by people who have visited these countries and seen the extreme pollution at first hand. This, by the way, is not exactly scientific.

Using satellites, and not relying on either the governments in question or second-hand stories, we can accurately assess the pollution levels there and elsewhere. Using satellite images to measure the amount of light absorbed or blocked by fine particulates in the atmosphere, otherwise known as air pollution, you can determine not only what the airborne pollutant might be, but also its size. And, by looking at the overall light blockage, an accurate estimate of the amount of pollution in the air can also be made. Recent studies show that many of these countries are covered in a pollution cloud that countries in the developed world would deem extremely harmful. And how do we know this with scientific certainty? From satellite measurements.

Energy Production

The recent boom in the production of shale oil in the United States and elsewhere is due in large part to the identification and geolocation of promising geologic formations for test drilling and fracking. "Fracking" is a somewhat new term that comes from the phrase "hydraulic fracturing". In fracking, massive amounts of previously unusable reservoirs of oil and natural gas are released for capture, sale, and transport from deposits deep within the Earth - many located at least a mile below the surface. In the United States alone, there may be as much as 750 trillion cubic feet of natural gas within shale deposits releasable by fracking [3]. How do energy companies know where to look for these deposits? In large part, by analyzing satellite imagery.

According to Science Daily (26 February 2009), a new map of the Earth's gravitational field based on satellite measurements makes it much less resource intensive to find new oil deposits. The map will be particularly useful as the ice melts in the oil-rich Arctic regions. The easy-to-find oilfields have already been found. To fuel the growing world economy, those harder-to-find deposits must be located and tapped - which is why satellite imagery is so important. Take away this and other satellite-dependent techniques of oil and gas exploration and the world economy will feel the impact through higher oil and natural gas prices.

#### Fracking makes extinction inevitable---try-or die to shut it off

Rev. Mac Legerton 18, Co-Founder and Executive Director of the Center for Community Action, Member of the Board of Directors of the NC Climate Solutions Coalition, Member of the Board of Directors of the Windcall Institute, “Will The U.S. Blaze A Trail To Mass Extinction?”, APPPL News, 1/15/2018, https://www.apppl.org/news/will-the-u-s-blaze-a-trail-to-mass-extinction/

As an elder, I now realize that there is even a greater threat to humanity and life on Earth than nuclear war—though, unlike a nuclear exchange, this threat is a slow-motion catastrophe. Can you guess what it is? Here’s a clue: it is something with which most people don’t have a personal relationship. Tragically, some persons remain in total denial of its validity, much less its present danger. And that’s the problem – that’s why this threat needs to be more seriously addressed on the local, state, national, and international level.

What is it? It’s the slow-motion but rapidly growing catastrophe of climate change. There’s now good news amidst this seemingly overwhelming challenge. But the answer may surprise you. Today we know what is the #1 preventable cause of climate change. It’s not coal, it’s not nuclear, and it’s not oil and gasoline. It’s actually the use of the very fuel that is touted as being cleaner, greener, and cheaper than all the rest. This fuel is called “Natural Gas”.

Let’s start with its name – “Natural Gas”. What is “natural gas”? There’s actually nothing “natural” about it when it is forcibly extracted from the ground through hydraulic fracturing, commonly known as “fracking”. When something is forcibly ruptured from deep within the earth with the use of toxic chemicals, the last name you would use for it is “natural”.

Fracking disrupts the geologic fault lines causing earthquakes, uses millions of gallons of fresh water that becomes permanently poisoned by unknown, cancer-producing chemicals added to it, creates air pollution during the drilling process, increases the risk of injury and explosions, raises major health risks to both people and place in close proximity to it, and changes the nature of both neighborhoods and landscapes. Fracking also leaves a massive carbon footprint of drilling wells as deep as 8,000 feet and then drilling horizontally over 10,000 feet; On top of all this, it leaks major amounts of gas into the environment.

So, what is this gas? It is 90-95% methane gas which is a hydrocarbon compound made up of one carbon atom and four hydrogen atoms (CH4). It releases carbon into the atmosphere and produces carbon dioxide (C02) just like coal does when it is burned. Methane is not its trace element–it is its undisputed compound of this fossil fuel product. If a compound is 90-95% of a product, it makes sense to call it by that name. Doesn’t it? Well, actually not if you want people to believe and think that it is something that it is not. It is un-natural methane gas produced under massive and highly toxic pressure and hazardous conditions.

Now that we know what this gas is, what does it do to the atmosphere and climate that is so dangerous? This hydrocarbon has properties that block the radiation of heat from Earth’s surface 100 times more effectively than CO2 (released from burning coal) during its first 10 years of release and 86 times more effectively in its first 20 years. Because of the climate emergency underway, the first 10 or 20 years matter most.

When utility companies and the larger fossil fuel companies state that they are committed to lowering carbon emissions, this just isn’t true. They are radically escalating the most dangerous and worst of all fossil fuels in relation to its impact on the climate. Now the industry wants to expand production of methane gas all over the world by calling it “the most environmentally friendly fossil fuel”and a “bridge fuel” that we can safely use until we transition to 100% renewable energy sources.

Why would a major business industry want to call its product by another name? Perhaps for the same reason that the tobacco industry did not like the term “coffin nails” or “cancer sticks” for cigarettes. Honestly, there’s a striking similarity between what are called cigarettes and natural gas. When both were produced and named, their harm was not fully known. Once the industries promoting them learned of their significant harm, they did everything they could to hide this knowledge from the public. They even hired scientists to deny their dangers. The tobacco industry was eventually sued, the truth was acknowledged, and billions of dollars were paid out in the tobacco settlement.

This same scenario that occurred with the tobacco industry needs to occur with methane gas and the fossil fuel industry. The major difference in these two scenarios is that that this fossil fuel product doesn’t just threaten the lives of individuals who voluntarily breathe it in – it threatens the lives of not only every human being, but also all life on the planet. The outcome of this scenario needs to be a moratorium and eventual end to all use of methane gas as an energy source. For the sake of all of us, our communities, and world, the sooner the better. This abomination is different. There is no time to waste.

## 1nc Space War

### Case – Space

#### No one’s going to war over a downed satellite

Bowen 18 [Bleddyn Bowen, Lecturer in International Relations at the University of Leicester. The Art of Space Deterrence. February 20, 2018. https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/]

Space is often an afterthought or a miscellaneous ancillary in the grand strategic views of top-level decision-makers. A president may not care that one satellite may be lost or go dark; it may cause panic and Twitter-based hysteria for the space community, of course. But the terrestrial context and consequences, as well as the political stakes and symbolism of any exchange of hostilities in space matters more. The political and media dimension can magnify or minimise the perceived consequences of losing specific satellites out of all proportion to their actual strategic effect.

#### Won’t go nuclear – seen as a normal conventional attack because of integration with ground forces

Firth 7/1/19 [News Editor at MIT Technology Review, was Chief News Editor at New Scientist. How to fight a war in space (and get away with it). July 1, 2019. MIT Technology Review]

Space is so intrinsic to how advanced militaries fight on the ground that an attack on a satellite need no longer signal the opening shot in a nuclear apocalypse. As a result, “deterrence in space is less certain than it was during the Cold War,” says Todd Harrison, who heads the Aerospace Security Project at CSIS, a think tank in Washington, DC. Non-state actors, as well as more minor powers like North Korea and Iran, are also gaining access to weapons that can bloody the noses of much larger nations in space.

**Pursuit of dominance leads to Sino-Russia alliance**

**Porter, DPhil, 19**

(Patrick, ModernHistory@Oxford, ProfInternationalSecurityAndStrategy@Birmingham, Advice for a Dark Age: Managing Great Power Competition, The Washington Quarterly, 42:1, 7-25)

Even the United States cannot prudently take on every adversary on multiple fronts. The costs of military campaigns against these adversaries in their backyards, whether in the Baltic States or Taiwan, would outstrip the losses that the U.S. military has sustained in decades. Short of all-out conflict, to mobilize for dominance and **risk escalation on multiple such fronts** would court several dangers. It would **overstretch the country**. The U.S. defense budget now approaches $800 billion annually, not including deficit-financed military operations. This is a time of ballooning deficits, where the Congressional Budget Office warns that “the prospect of large and growing debt poses substantial risks for the nation.”27 If in such conditions, current expenditure is not enough to buy unchallengeable military preponderance—and it may not be—then the failure lies not in the failure to spend even more. Neither is the answer to sacrifice the quality of civic life at home to service the cause of preponderance abroad. The old “two war standard,” a planning construct whereby the United States configures its forces to conduct two regional conflicts at once, would be unsustainably demanding against more than one peer competitor, or potentially with a roster of major and minor adversaries all at once.28 After all, the purpose of American military power is ultimately to secure a way of life as a constitutional republic. To impose ever-greater debts on civil society and strip back collective provision at home, on the basis that the quality of life is expendable for the cause of hegemony, is perversely to set up power-projection abroad as the end, when it should be the means. The problem lies, rather, in **the inflexible pursuit of hegemony itself**, and the **failure to balance commitments** with scarce resources. To attempt to suppress every adversary simultaneously would **drive adversaries together, creating hostile coalitions**. It also may not succeed. Counterproliferation in North Korea is difficult enough, for instance, but the task becomes more difficult still if U.S. enmity with China drives Beijing to refuse cooperation over enforcing sanctions on Pyongyang. Concurrent competitions would also split American resources, attention and time. Exacerbating the strain on scarce resources between defense, consumption and investment raises the polarizing question of whether preponderance is even worth it, which then undermines the domestic consensus needed to support it. At the same time, reduced investment in infrastructure and education would damage the economic foundations for conducting competition abroad in the first place. Taken together, indiscriminate competition risks creating the thing most feared in traditional U.S. grand strategy: **a hostile Eurasian alliance** leading to continuous U.S. mobilization against hostile coalitions, turning the U.S. republic into an illiberal garrison state. If the prospect for the United States as a great power faces a problem, it is not the size of the defense budget, or the material weight of resources at the U.S. disposal, or popular reluctance to exercise leadership. Rather, the problem lies in the scope of the policy that those capabilities are designed to serve. To make the problem smaller, Washington should take steps to make the pool of adversaries smaller.

#### Space wars don’t cause escalation

James Pavur 19, Professor of Computer Science Department of Computer Science at Oxford University and Ivan Martinovic, DPhil Researcher Cybersecurity Centre for Doctoral Training at Oxford University, “The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space”, 2019 11th International Conference on Cyber Conflict: Silent Battle T. Minárik, S. Alatalu, S. Biondi, M. Signoretti, I. Tolga, G. Visky (Eds.), <https://ccdcoe.org/uploads/2019/06/Art_12_The-Cyber-ASAT.pdf>

A. Limited Accessibility Space is difficult. Over 60 years have passed since the first Sputnik launch and only nine countries (ten including the EU) have orbital launch capabilities. Moreover, a launch programme alone does not guarantee the resources and precision required to operate a meaningful ASAT capability. Given this, one possible reason why space wars have not broken out is simply because only the US has ever had the ability to fight one [21, p. 402], [22, pp. 419–420]. Although launch technology may become cheaper and easier, it is unclear to what extent these advances will be distributed among presently non-spacefaring nations. Limited access to orbit necessarily reduces the scenarios which could plausibly escalate to ASAT usage. Only major conflicts between the handful of states with ‘space club’ membership could be considered possible flashpoints. Even then, the fragility of an attacker’s own space assets creates de-escalatory pressures due to the deterrent effect of retaliation. Since the earliest days of the space race, dominant powers have recognized this dynamic and demonstrated an inclination towards de-escalatory space strategies [23]. B. Attributable Norms There also exists a long-standing normative framework favouring the peaceful use of space. The effectiveness of this regime, centred around the Outer Space Treaty (OST), is highly contentious and many have pointed out its serious legal and political shortcomings [24]–[26]. Nevertheless, this status quo framework has somehow supported over six decades of relative peace in orbit. Over these six decades, norms have become deeply ingrained into the way states describe and perceive space weaponization. This de facto codification was dramatically demonstrated in 2005 when the US found itself on the short end of a 160-1 UN vote after opposing a non-binding resolution on space weaponization. Although states have occasionally pushed the boundaries of these norms, this has typically occurred through incremental legal re-interpretation rather than outright opposition [27]. Even the most notable incidents, such as the 2007-2008 US and Chinese ASAT demonstrations, were couched in rhetoric from both the norm violators and defenders, depicting space as a peaceful global commons [27, p. 56]. Altogether, this suggests that states perceive real costs to breaking this normative tradition and may even moderate their behaviours accordingly. One further factor supporting this norms regime is the high degree of attributability surrounding ASAT weapons. For kinetic ASAT technology, plausible deniability and stealth are essentially impossible. The literally explosive act of launching a rocket cannot evade detection and, if used offensively, retaliation. This imposes high diplomatic costs on ASAT usage and testing, particularly during peacetime. C. Environmental Interdependence A third stabilizing force relates to the orbital debris consequences of ASATs. China’s 2007 ASAT demonstration was the largest debris-generating event in history, as the targeted satellite dissipated into thousands of dangerous debris particles [28, p. 4]. Since debris particles are indiscriminate and unpredictable, they often threaten the attacker’s own space assets [22, p. 420]. This is compounded by Kessler syndrome, a phenomenon whereby orbital debris ‘breeds’ as large pieces of debris collide and disintegrate. As space debris remains in orbit for hundreds of years, the cascade effect of an ASAT attack can constrain the attacker’s long-term use of space [29, pp. 295– 296]. Any state with kinetic ASAT capabilities will likely also operate satellites of its own, and they are necessarily exposed to this collateral damage threat. Space debris thus acts as a strong strategic deterrent to ASAT usage.

#### Loss of satellites will shut down terrestrial mining

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Resource Location

Looking for rare minerals to be mined for our many gadgets, household appliances, and industrial machines? Soil type is often a strong indicator of whether or not underground deposits of metals and minerals are located. By using satellite data to identify promising surface structural features and different soil types, mining companies can better identify promising mining locations, wasting less time and effort in finding the best places to obtain much-needed industrial resources. Without satellite images, the finding and assessment of promising new mines would grind to a halt as the industries retooled back into the days of much slower and labor-intensive field surveys (but without GPS!).

#### Amazon mining will cause extinction

Charito Ushiñahua 11, Anthropologist Working for the Preservation of Indigenous Amazonian Cultures, “Yanomami Indians: The Fierce People?”, http://www.amazon-indians.org/yanomami.html

A mineralogical survey of the northern Amazon by the Brazilian government in 1975 revealed the presence of gold ore in the Roraima region of Brazil. By the early 1980's, miners in search of gold began invading the Yanomami territory in Brazil and by 1987 it had become a full-fledged gold rush. Over 30,000 prospectors entered Yanomami lands and established over a hundred clandestine mining operations. The resulting massacres and diseases brought by these invaders is estimated to have caused the death of over 2,000 Yanomami. One of the problems with gold mining is the environmental destruction it causes. In order to separate gold from rocks and soil, mercury is used. Mercury in the rivers and streams bio-accumulates and permeates the entire ecosystem. The mercury accumulates in predators and hunters (such as the Yanomami) higher up the food chain and creates a neurotoxin that causes birth defects and abnormal child development. The Yanomami have had increased child mortality rates while their birth rates have declined putting their very existence into risk. Moreover, malaria increased in the area due to the stagnant pools left by the miners that increase the mosquito populations that are vectors of the disease. Some have estimated that malaria is responsible for the deaths of about 13% of the Yanomami population every year. However, the negative influence of the miners extends beyond physical health. Their introduction of alcohol and other western goods has had an immense negative effect on Yanomami society itself.

In response to the crisis created by the gold miners, in 1992 the Yanomami territory was protected by the Brazilian government by creating a federal indigenous reserve. However, the gold miners were not happy about the creation of the reserve and in July, 1993, a group of miners tried to exterminate an entire village in what has become to be known as the "Haximu Massacre." At lease 16 Yanomami were killed in what many have called genocide. Some of the miners were tried and convicted and after numerous appeals on the 7th of August, 2006 the Brazilian Supreme Federal Court reaffirmed that the crime known as the Haximu Massacre and upheld the ruling sentencing the miners to 19 years in prison for genocide. However, to this day there is political pressure by the mining industry to reduce the Yanomami territory and allow commercial mining operations on their lands.

In the year 2000, a journalist named Patrick Tierney published a book called, "Darkness in El Dorado," and accused anthropologist Napoleon Chagnon and his colleague geneticist James Neel of numerous misdeeds, among them intentionally creating an epidemic of measles among the Yanomami people in order to study the effects of natural selection on primitive societies. Tierney states that the resulting epidemic caused the death of hundreds of Yanomami. Incredibly, Tierney charged that the experiments were funded by the US Atomic Energy Commission, who sought to model the societal consequences of mass mortality caused by nuclear war. In addition to the measles epidemic, Tierney charged that Chagnon mischaracterized the Yanomami as "The Fierce People" when in fact it was Chagnon who was causing the violence by introducing enormous amounts of western goods such as machetes into the Yanomami society, thus stimulating warfare over the introduced goods. Tierney also accused Chagnon of fraud by staging films, such as "The Axe Fight" that he helped produce. The journalist charged that the anthropologist prescripted the films and that they were not spontaneous as portrayed.

Tierney's book caused an uproar in the anthropological community and the American Anthropological Association (AAA) got involved in the debate. In fact, the AAA convened a special commission to investigate the allegations against Chagnon and Neel. The report by the AAA issued in May, 2002 exonerated the anthropologist and geneticist from causing a measles epidemic among the Yanomami. Nonetheless, the AAA criticized some aspects of Chagnon's research, including his portrayal of the Yanomami as "The Fierce People," and his bribing of Venezuelan officials. However, the AAA debate was not over and three years later in June, 2005 they rescinded the acceptance of the 2002 report.

As someone who is working to support indigenous people, I would like to point out that over the many years since publishing his first book on the Yanomami (whose revenues made him a millionaire), Chagnon has failed to bring significant aid to the Yanomami people. In fact, he sought to damage the indigenous movement by publicly criticizing Davi Kopenawa, a Yanomami activist who helped establish the Yanomami reserve in Brazil. One might ask if it was proper behavior for an anthropologist to hurt the efforts of an indigenous Amazonian activist attempting to defend his people. Interestingly, the Yanomami leader Davi Kopenawa has predicted the destruction of the entire human race if the Amazon Rainforest is destroyed. Kopenawa states, "The forest-land will only die if it is destroyed by whites. Then, the creeks will disappear, the land will crumble, the trees will dry and the stones of the mountains will shatter under the heat. The xapiripë spirits who live in the mountain ranges and play in the forest will eventually flee. Their fathers, the shamans, will not be able to summon them to protect us. The forest-land will become dry and empty. The shamans will no longer be able to deter the smoke-epidemics and the malefic beings who make us ill. And so everyone will die." Many ecologists seem to agree with Kopenawa, believing that the Amazon Rainforest are the "lungs of the Earth" and that if the Amazon is destroyed, it will cause a global ecological disaster resulting in the eventual destruction of the human race.

#### Satellites are crucial for large, industrial megafarms

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Agriculture

To feed the Earth's growing population affordably, farming has gone from a mostly decentralized, family-owned business to corporate farming on a scale never before imagined. These industrial megafarms are a primary reason that many people in the world can enjoy plentiful and varied foods at a reasonable cost. On this scale, deciding what crop to plant in a given field is not just business - it's science. And the science relies, in large part, on data from space.

Companies such as the Satellite Imaging Corporation (SIC) provide data from space on overall crop health, soil analysis, and irrigation impacts and efficiencies. From space, you can easily map soil variations, finding areas rich in organic matter and others less so - this allows optimized planting to take advantage of crops that thrive in any given soil environment. Very large farms also use satellite images to assess the overall health of their crops by land area, spotting those that are being impacted by non-optimal soil moisture content, etc., allowing the farmer to take corrective action while there is still time to save the crop.

#### No space war--- interdependence and deterrence check.

Bragg et al, July 2018 - \*Dr. Allison Astorino-Courtois, NSI’s Chief Analytics Officer (CAO) and Executive Vice President, PhD in IR @ NYU \*\*Dr. Robert Elder, PhD @ Emory, BA @ Clemson, Assistant prof of History @ Baylor \*\*\*Dr. Belinda Bragg, principle research scientist at NSI, Inc. Lecturer in polisci @ Texas A&M.;“Contested Space Operations, Space Defense, Deterrence, and Warfighting: Summary Findings and Integration Report,” NSI, https://nsiteam.com/social/wp-content/uploads/2018/11/Space-SMA-Integration-Report-Space-FINAL.pdf

Everyone needs space

While the US may be relatively more dependent on space for national security than are other states, it is far from alone in relying on space. Nuclear armed states are dependent on space for important command and control functions, and major powers are increasingly using space for battlefield situational awareness and communications. China and Russia were identified as having significant (and fairly equal) levels of strategic risk in space (ViTTa Q16), although their regional security priorities and (to date) less spacedependent economies place them at an advantage to the US. They may, therefore, see the strategic risk of conflict is space as lower than does the US. Still, space capabilities remain a source of economic expansion and national pride for both, and their calculations of the cost of conflict involving space may include consideration of these factors. Even now, there is a general consensus that the US and other actors have more to gain from space than they have from the loss of space-based capabilities (ViTTa Q3). This suggests that, although the US is more vulnerable in the space domain than are other states, the likelihood that aggressive action against an adversary’s space assets would be reciprocated may provide a degree of security. It also creates another incentive for actors to use diplomacy and international law to reduce risk and increase transparency in the space domain.

#### No space war and terrestrial conflict turns it

Luke Penn-Hall 15, Analyst at The Cipher Brief, M.A. from the Johns Hopkins School for Advanced International Studies, B.A. in International Relations and Religious Studies from Claremont McKenna College, “5 Reasons “Space War” Isn’t As Scary As It Sounds”, The Cipher Brief, 8/18/2015, https://www.thecipherbrief.com/article/5-reasons-%E2%80%9Cspace-war%E2%80%9D-isn%E2%80%99t-scary-it-sounds

The U.S. depends heavily on military and commercial satellites. If a less satellite-dependent opponent launched an anti-satellite (ASAT) attack, it would have far greater impact on the U.S. than the attacker. However, it’s not as simple as that – for the following reasons:

1. An ASAT attack would likely be part of a larger, terrestrial attack. An attack on space assets would be no different than an attack on territory or other assets on earth. This means that no space war would stay limited to space. An ASAT campaign would be part of a larger conventional military conflict that would play out on earth.

2. Every country with ASAT capabilities also needs satellites. While the United States is the most dependent on military satellites, most other countries need satellites to participate in the global economy. All countries that have the technical ability to play in this space – the U.S., Russia, China and India - also have a vested interest in preventing the militarization of space and protecting their own satellites. If any of those countries were to attack U.S. satellites, it would likely hurt them far more than it would hurt the United States.

3. Destruction of satellites could create a damaging chain reaction. Scientists warn that the violent destruction of satellites could result in an effect called an ablation cascade. High-velocity debris from a destroyed satellite could crash into other satellites and create more high-velocity debris. If an ablation cascade were to occur, it could render certain orbital levels completely unusable for centuries.

4. Any country that threatened access to space would threaten the global economy. Even if a full-blown ablation cascade didn’t occur, an ASAT campaign would cause debris, making operating in space more hazardous. The global economy relies on satellites and any disruption of operations would be met with worldwide disapproval and severe economic ramifications.

5. International Prohibits the Use of ASAT Weapons. Several international treaties expressly prohibit signatory nations from attacking other countries’ space assets. It is generally accepted that space should be treated as a global common area, rather than a military domain.

While it remains necessary for military planners to create contingency plans for a, space war it is a highly unlikely scenario. All involved parties are incentivized against attacking. However, if a space war did occur, it would be part of a larger conflict on Earth. Those concerned about the potential for war in space should be more concerned about the potential for war, period.

#### Sino-Russian relations breakdown is the most likely scenario for nuclear war---last time barely averted nuclear exchange and the next time will be worse

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The Sino-Soviet War The 1969 Sino-Soviet War was caused by broad ideological and political tensions, but clearly demonstrates the limited nature of conflict between two nuclear powers. It depicts the significant risks of miscalculation or inadvertent escalation and the difficulty in controlling a crisis once it begins. Military leaders on both sides encouraged escalation—and horizontal escalation nearly caused the crisis to spiral out of control. International actors and information operations were also critical influences on the conflict and on the eventual negotiated peace. The limited nature of the war, risk and external influences are all visible in the severely constrained military operations and in the strict control exercised by political leadership during the crisis. These constraints and influences significantly impacted the nature of military operations in 1969 and contributed to the complex strategic environment. The evolution of Sino-Soviet relations leading up to 1969 is complex and varied, ranging from deep military and economic cooperation to outright hostility. While the relationship between Joseph Stalin and Mao Zedong was functional, though sometimes tense, relations declined precipitously under Nikita Khrushchev.32 Under Khrushchev, deep ideological fissures became visible, along with tension over leadership of the communist world.33 By 1956, Khrushchev had said, “Conflict with China is inevitable.”34 Tension continued to grow; by 1959, border tension began to surface.35 Conflict along the border was a physical manifestation of broader political and ideological hostility.36 The specific dispute centered on differing interpretations of the 1860 Treaty of Peking, which identified the Amur and Ussuri rivers as forming the eastern border between China and Russia.37 Disagreements arose because of the perceived inequality of the Treaty of Peking and because of the potential location of the exact border.38 Negotiations over the border dispute began in February 1964, but broke down in July, by which time Mao was convinced that Russia posed a looming threat.39 Relations continued declining throughout 1965. Leonid Brezhnev’s ouster of Nikita Khrushchev on 14 October 1964 initially raised hopes that Sino-Soviet relations would improve, but they did not.40 In 1965, the Soviet Union began a major military buildup in the Far East—a build-up that included nuclear forces.41 China added to the regional instability when Mao initiated the Chinese Cultural Revolution in May 1966.42 But it was three key events in 1968 that really triggered the conflict that would occur in 1969. First, on 5 January 1968, a Sino-Soviet skirmish on Qiliqin Island resulted in four Chinese deaths.43 These were the first battle deaths in a long series of border altercations and skirmishes, all of which would significantly raise tensions.44 Second, on 20 August 1968, Soviet forces invaded Czechoslovakia to quell the Prague Spring.45 The invasion—and the resultant Brezhnev Doctrine, which claimed the Soviet Union’s right to intervene in socialist countries— caused Mao significant concern.46 Third, from 27 December 1968 to 25 February 1969, nine border incidents occurred on and around Zhenbao Island; for the first time, they included the use of weapons to fire warning shots.47 These increasing tensions caused China’s Heilonghiang and Shenyang military regions to recommend escalation in the form of an attack near Zhenbao Island at the end of January 1969.48 In the midst of growing acrimony, nuclear dynamics in the region continued to evolve. In 1949, the Soviet Union tested its first nuclear weapon;49 by 1969, it had a large and diverse nuclear arsenal estimated at over 10,000 warheads.50 China and Russia signed the New Defense Technical Accord on 15 October 1957, committing Moscow to assist Beijing in developing a prototype nuclear bomb.51 However, by 1959, the Soviet Union had reneged on all nuclear assistance, withdrawing all advisors from China in August 1960.52 But, China continued developing its nuclear capabilities, and, in October 1964, conducted its first nuclear test.53 By 1969, China possessed rudimentary nuclear forces, numbering about 50 warheads capable of delivery by bombers and fewer than 10 single-stage, liquid-fueled, DF-2 medium-range ballistic missiles.54 Deteriorating Sino-Soviet relations, escalating border violence, the ongoing Soviet military buildup, the Soviet invasion of Czechoslovakia and the Brezhnev Doctrine all combined to convince Mao that China must demonstrate strength and resolve against the perceived Soviet threat.55 Although Chinese documentary materials remain scant, the available evidence emphasizes China’s focus on deterrence and suggests that nuclear weapons had little impact on Mao’s initial decision to attack the Soviet Union.56 China essentially viewed its actions as defensive, as part of China’s overall “active defense” or “offensive defense” concepts.57 Interestingly, Mao believed that the Soviet Union would back down, partially because of the perceived Soviet capitulation during the 1962 Cuban Missile Crisis.58 However, as Mao would later find, he wildly miscalculated and misunderstood Soviet capabilities and intentions.59 On 19 February 1969, the Chinese General Staff and Ministry of Foreign Affairs approved the Zhenbao Island Counter-Interference Struggle Plan.60 China selected Zhenbao Island as the site to attack because it was clearly on the Chinese side of the thalweg, because Zhenbao was going to be allocated to China in the failed 1964 border talks and because the Chinese bank was elevated and only 100 meters from the island—it was 400 meters from the Soviets’ position (see figure 1).61 These strategic and tactical advantages combined to make Zhenbao the ideal site to give the Soviet Union a bloody nose and a sharp lesson. And so, on 2 March 1969, Chinese troops ambushed a group of Soviet border guards on Zhenbao Island in the Ussuri River.62 On the night of 1–2 March, a battalion of Chinese troops infiltrated Zhenbao and dug in defensive positions.63 The next morning, approximately 25 Chinese border guards visibly marched across the ice toward Zhenbao.64 When a platoon of Soviet border guards approached to demand that the Chinese leave, the Chinese sprang the battalion ambush.65 After nearly two hours of fighting that would include Soviet reinforcements from another border outpost, the Chinese withdrew from Zhenbao.66 The fight eventually claimed an unknown number of Chinese casualties; 31 Soviets were killed and 14 were wounded.67 Both sides promptly issued statements and blamed the other for the violence, and massive protests broke out in both Moscow and Beijing.68 And then, contrary to Mao’s expectations, the Soviet Union escalated the crisis and counterattacked on 15 March.69 This time, both sides escalated vertically, using more forces and firepower.70 During the nine-hour fight, a Chinese regiment battled a Soviet regiment that was supported by 50 tanks and armored personnel carriers, artillery and air support.71 The Soviets fired approximately 10,000 artillery rounds, flew 36 aircraft sorties, deployed top-secret T-62 tanks and fired new BM-21 mobile rocket launchers on Zhenbao.72 They won decisively; 800 Chinese were killed, compared to only 60 Soviets.73 Immediately following the battle, Moscow alerted the strategic rocket forces in the Far East.74 In response, Mao readied his nuclear forces, saying, “We are now confronted with a formidable enemy. . . . Our nuclear bases should be prepared . . . for the enemy’s air bombardment.”75 However, Mao was also cognizant of his miscalculations, and he attempted to tamp down the crisis somewhat by ordering the People’s Liberation Army to “not fight anymore.”76 The Soviet Union’s response to the Sino-Soviet War emphasized coercive diplomacy that integrated limited force and nuclear threats to bring Beijing to the negotiating table. The Soviet Union wanted to punish China for its aggression, to demonstrate Soviet strength and resolve and to avoid a protracted conflict or major war.77 It executed this strategy by seeking to open negotiations on multiple occasions and in multiple forums and combined these diplomatic offers with increasing nuclear and conventional threats.78 Over time these threats grew more provocative and specific, but they were always followed by denial of the threats and by routinely discrediting Chinese claims of Soviet hysteria and war-mongering.79 Some specific instances that demonstrate increased Soviet threats include a move in June 1969 of bomber units from the west to Mongolia and Siberia, where they conducted practice strikes on mock Chinese nuclear facilities.80 The Soviet Union also promoted Colonel-General Vladimir Tolubko to command the Far Eastern Military District.81 Because Tolubko had been the Deputy Commander of the strategic rocket forces, Beijing could not miss the implication of the threat that his promotion signaled.82 Additionally, several Soviet military leaders, including the Defense Minister, advocated a preventive unrestricted nuclear attack to “once and for all get rid of the Chinese threat.”83 China’s initial responses to Soviet coercive diplomacy were muted; Beijing generally avoided both diplomatic responses and escalation.84 Their muted response could have stemmed from several causes.85 First, Mao may have been focused on domestic issues, especially the Cultural Revolution and Ninth Congress of the Communist Party of China, scheduled for April 1969.86 Second, tensions with Moscow were potentially useful for domestic political purposes.87 Third, China apparently did not believe a major war was likely because they thought that the Soviet Union was a “paper tiger,” and they felt little urgency to negotiate after the 15 March battle.88 However, in June and July, the border again flared up, and China accused the Soviets of inciting as many as 429 incidents.89 The most significant clash since Zhenbao occurred on 13 August in the Tielieketi area of the Xinjiang region.90 During the battle, Soviet troops using armor, two helicopters and artillery ambushed and killed 38 Chinese soldiers.91 This represented a horizontal escalation away from Zhenbao and moved tension near the Chinese border with Kazakhstan (see figure 2). Horizontal escalation toward Tielieketi was especially concerning to China because it highlighted their vulnerabilities in the west.92 The combination of Colonel-General Tolubko’s promotion, escalating border violence and international nuclear threats caused China to reassess the situation and recognize the nuclear danger of the crisis.93 In August 1969, the Soviets began issuing nuclear threats through third party states. Their previous threats had used official newspapers and radio broadcasts; this new strategy resulted in substantially increasing Soviet credibility and political resolve.94 The international community had already been watching events on the Sino-Soviet border and were concerned about nuclear escalation—this concern was only increased when Soviet leadership approached foreign capitals, inquiring about their potential reactions to a Soviet nuclear attack on China.95 On 18 August, Boris Davydov, the Second Secretary of the Soviet Embassy, directly asked William Stearman, a mid-level U.S. State Department (DoS) official, what the United States would do if the Soviet Union attacked and destroyed China’s nuclear installations.96 This ignited a debate in the Nixon administration about U.S. policy toward this specific Soviet proposal and broader U.S. policy regarding the Sino-Soviet dispute.97 The DoS generally believed that a Soviet attack was unlikely, while Henry Kissinger, DoD and some intelligence agencies thought an attack was more likely.98 The United States eventually chose to remain neutral and balanced between Russia and China.99 However, Richard Helms, the Director of the CIA, did publicly state that the Soviets had probed the idea of attacking China’s nuclear program.100 Immediately following this revelation, China began preparing for major war.101 Beijing began establishing senior working groups, mobilizing the population, dispersing critical industries, digging air-raid shelters, stockpiling supplies and sending troops to the border.102 Their strategy essentially shifted to deterrence, using conventional rather than nuclear forces and threatening a massive protracted “people’s war.”103 Their preparations did cause concern in the Soviet Union; while their nuclear forces were relatively weak, China’s massive conventional army threatened key Soviet strategic interests.104 Threats to Vladivostok, Blagoveshchensk, Khabarovsk and the Trans-Siberian Railroad forced Moscow to reconsider its coercive diplomacy.105 While Moscow’s nuclear threats were probably possible, they were arguably part of its coercive diplomacy strategy; a conventional attack would have been more likely.106 However serious their nuclear intentions may or may not have been, once Beijing received what they considered to be credible nuclear threats, the crisis began to spiral out of control. As escalation began, Moscow returned to diplomatic engagement.107 However, fog, friction, fear and paranoia took hold in Beijing. China would be convinced on three separate occasions that the Soviets were launching an attack. First, on 11 September 1969, after agreeing to a high-level meeting at the Beijing airport, Chinese leaders became certain that the Soviets would use the opportunity to attack with commandos and nuclear bombers.108 Following the meeting, their fear peaked again when they discovered that the Soviet premier had never disavowed a nuclear strike; naturally, Beijing increased war preparation.109 These activities included transferring elite military units from the south to the north, moving air defense forces north, forming new tank divisions and building more air-raid shelters.110 China also conducted its first underground nuclear test on 23 September and tested a thermonuclear device on 29 September.111 Moscow responded by suggesting that formal negotiations begin in October;112 Beijing received this suggestion favorably and negotiations were set to begin on 20 October.113 However, China remained fearful, especially on 1 October, Chinese National Day.114 On that day, their military was placed on “first-degree combat readiness” and they dispersed airplanes, placed obstacles on runways and armed airport workers.115 The eventual third incident resulted from China’s fear that the Soviets were planning a decapitating strike to occur during the 20 October meeting. Moving to counter this defensively, Mao suggested on 14 October that all Central Party, military and civilian leaders leave Beijing.116 They immediately dispersed to other cities or hardened wartime command centers.117 On 18 October, without Mao’s prior approval, China’s Defense Ministry issued “Number 1 Order,” directing regional commands (specifically the three northern commands) to disperse and prepare for war.118 This order also instructed China’s strategic forces, the Second Artillery, to execute “launching preparations.”119 This was the first and only time that China’s nuclear weapons were placed on combat alert.120 Luckily, either Moscow did not see the preparations, or else chose to ignore them and continued to deescalate the crisis. On 20 October, the Soviet Union and China finally began negotiating. Negotiations were protracted and complex, but they did resolve the crisis, i.e., the first direct conflict between nuclear powers.

## 1nc Heg

#### Unipolarity wil inevitably fall

Mearsheimer 19 [John J. Professor of IR @ Uchicago, “Bound to Fail.” International Security, Vol. 43, No. 4]

There is an additional problem linked to hyperglobalization that has little to do with the growing political opposition to the international order in liberal countries, and everything to do with the global balance of power. Until Trump came to power in 2017, Western elites, in keeping with their post–Cold War policy of engaging, not containing, China, were deeply committed to integrating China into the world economy, including all of its key economic institutions. An increasingly prosperous and wealthy China, they assumed, would eventually become a liberal democracy and an upstanding member of the liberal international order. What the architects of that policy did not realize, however, is that by helping accelerate Chinese growth, they were actually helping undermine the liberal order, as China has rapidly grown into an economic powerhouse with significant military capability. In effect, they have helped China become a great power, thus undercutting unipolarity, which is essential for maintaining a liberal world order. This problem has been compounded by the resurgence of Russia, which is once again a great power, although clearly a weak one. With the rise of China and Russia’s comeback, the international system has become multipolar, which is a death knell for the liberal international order. To make matters worse, neither China nor Russia has become a liberal democracy. Even if China and Russia had not become great powers and the world remained unipolar, the liberal order would still be falling apart today because of its intrinsic flaws. The election of Donald Trump, who sharply and frequently criticized all the key elements of the post–Cold War order during his presidential campaign, is evidence of how much trouble it was in by 2016. Thus, if the international system had remained unipolar, the liberal world order would have devolved into an agnostic order under President Trump, as realist orders have no place in unipolarity. There is certainly no evidence that he is committed to refashioning the existing liberal order. Indeed, he appears bent on wrecking it. With or without China, the liberal international order was destined to fail, because it was fatally flawed at birth

summary

The various causal processes described above have all played an important role in subverting the liberal international order. Although each one has a distinct logic, they have often operated synergistically. For example, the negative effects of hyperglobalization on the lower and middle classes have combined with the nationalist resentment over immigration and the sense of lost sovereignty to fuel a strong populist backlash against the principles and practices of the liberal order. Indeed, that anger has often been directed at the liberal elites who have benefitted from the order and who vigorously defend it. That resentment, of course, has had significant political consequences. It has caused deep political divisions in the United States and other Western democracies, led to Brexit, helped put Trump in the White House, and fueled support for nationalist leaders around the world.

Where Are We Headed?

One might acknowledge that the liberal international order is in terminal decline, but argue that it can be replaced with a more pragmatic version, one that avoids the excesses of the post–Cold War order.85 This more modest liberal order would pursue a more nuanced, less aggressive approach to spreading liberal democracy, rein in hyperglobalization, and put some significant limits on the power of international institutions. The new order, according to this perspective, would look something like the Western order during the Cold War, although it would be global and liberal, not bounded and realist. This solution is not feasible, however, because the unipolar moment is over, which means there is no chance of maintaining any kind of liberal international order for the foreseeable future. Furthermore, President Trump has no intention of pursuing a “liberal-lite” world order, and without his support, that option is a nonstarter. But even if Trump were not an obstacle and the international system were to remain unipolar, the United States would fail if it lowered its sights and attempted to construct a less ambitious liberal order. Indeed, it would end up building an agnostic international order instead. It is impossible to build a meaningful liberal global order with modest or more passive policies. The enterprise requires too much social engineering in too many places. If it has any chance of succeeding (I think it has none), the liberal unipole and its allies must relentlessly pursue highly ambitious global policies, which is why the United States and its liberal partners acted the way they did in the wake of the Cold War. That approach, however, is now politically infeasible because of past failures. Consequently, the liberal democracies have no choice but to take small steps here and there to remake the world in their own image, while adopting a live and let live approach toward most countries in the world. That humble approach would effectively produce an agnostic order. But that is not going to happen, because the system is multipolar and great power politics are once again at play. Thus, the key question is: What kinds of realist orders will dominate the landscape in the new multipolar world?

#### Balancing solves regional stability by expanding alliance networks and stopping favoritism that encourages regional aggression

Walt 19 [STEPHEN M. WALT is Robert and Renee Belfer Professor of International Affairs at the Harvard Kennedy School and the author of The Hell of Good Intentions: America's Foreign Policy Elite and the Decline of U.S. Primacy. Foreign Affairs. May/June. “The End of Hubris And the New Age of American Restraint.” <https://www.foreignaffairs.com/articles/2019-04-16/end-hubris> My OCR sometimes turns E’s into C’s, I think I got them all, but please let me know if I missed one]

As an offshore balancer, the United States would establish normal relations with all countries in the region, instead of having “special relationships" with a few states and profoundly hostile relations with others. No country in the Middle East is so virtuous or vital that it deserves unconditional U.S. support, and no country there is so heinous that it must be treated as a pariah. The United States should act as China, India, Japan, Russia, and the eu do, maintaining normal working relationships with all states in the region -including Iran. Among other things, this policy would encourage rival regional powers to compete for U.S. support, instead of taking it for granted. For the moment, Washington should also make it clear that it will reduce its support for local partners if they repeatedly act in ways that undermine U.S. interests or that run contrary to core U.S. values. Should any state threaten to dominate the region from within or without in the future, the United States would help the rest balance against it, calibrating its level of effort and local presence to the magnitude of the danger.

#### Heg encourages allies to reduce defense spending and encourages risky behavior entanglement – turns Taiwan

Posen ’16 (Barry R; 8/7/2016; Ford International Professor of Political Science at MIT, Director of the MIT Security Studies Program Council on Foreign Relations International Affairs Fellow; Rockefeller Foundation International Affairs Fellow; Guest Scholar at the Center for Strategic and International Studies; Woodrow Wilson Center Fellow; Smithsonian Institution; Transatlantic Fellow of the German Marshall Fund of the United States, and most recently Visiting Fellow at the John Sloan Dickey Center at Dartmouth College. "The High Costs and Limited Benefits of America’s Alliances," National Interest, <http://nationalinterest.org/blog/the-skeptics/the-high-costs-limited-benefits-americas-alliances-17273?page=show//)MBA> HBJ

The United States stands at the center of a far flung global alliance system, which commits it to defend the security of countries rich and poor, great and small, liberal and illiberal. The principal U.S. formal alliances are the North Atlantic Treaty Organization, the U.S.-Japan security treaty, the Republic of Korea Treaty, and the Australia-New Zealand (ANZUS) treaty. The United States has less formal relationships with Israel and several Arab states, and many others around the world. The foreign-policy establishment insists that all of these alliances are central to our security. The reasons offered since the end of the Cold War to support this judgment are seldom clear, and the costs are always buried, if acknowledged at all. The value of U.S. alliances should be judged on their contribution to U.S. security--the ability to defend the safety, sovereignty, and territorial integrity of the United States. The combination of the inherent strengths of the U.S. economy, the nature of modern military technology--both nuclear and conventional, along with the American military's mastery of those technologies--and two vast ocean barriers, make it either unbelievably foolhardy or hugely difficult for others to constitute a major threat to the U.S. homeland. Given the relative ease of ensuring U.S. security without extensive help from others, it is a challenge to show that the security value of these alliances exceeds the costs and risks incurred for them. In no case do current allies directly "defend" the United States, though some do occupy important strategic geography, which contributes to our military power. At best, our allies defend themselves with vast assistance from the United States. What does this assistance cost? Costs The United States bears four principal costs for these alliances: 1) the direct military costs; 2) the costs of wars waged mainly for the purpose of reassuring these allies; 3) the nuclear risks necessary to "extend" nuclear deterrence to these allies and 4) the "moral hazard" consequences of security guarantees, which have the perverse effect of driving down the defense efforts of allies and further driving up U.S. military costs. Supporters of the present alliance system routinely minimize its military costs. The Department of Defense's accounting systems make the calculation of such costs difficult. One cannot find a clear official statement that apportions the DOD budget to Europe, the MIddle East, and Asia. If a lay person attempts such a calculation, they will be brought up short by the defining characteristic of U.S. post-Cold War force structure: the U.S. military is essentially a global strategic reserve that can concentrate in defense of whichever ally is most in need of assistance. Small numbers of U.S. troops live abroad in Europe, Asia and the Middle East, and these small numbers make the effort look tiny. We must therefore try to estimate the cost of the U.S. grand strategy that commits the country to defend all these places. I have argued that if the United States were more judicious in its promises abroad, perhaps a fifth of the defense budget could be cut (excluding the costs of actual wars), amounting to roughly one hundred billion dollars per year at current prices. This is a nontrivial sum with major opportunity costs: it could reduce the deficit; repair the country's crumbling infrastructure; retrain American workers to compete more effectively in the global economy, or simply be returned to the taxpayer. Instead it subsidizes the defense of prosperous allies, providing welfare for the rich. The "credibility" wars that the U.S. fights, or threatens are another cost of the alliance system. The Balkan Wars of the 1990s fall into this category. So far, the post-Cold War world has not seen very expensive wars of this kind, but there was nothing about the Balkan wars that threatened the United States. Currently, members of the foreign-policy establishment argue that the United States should be assisting Ukraine in its fight with Russia and subverting the brutal Assad regime, in part to convince others of U.S. credibility. Once committed to defend allies everywhere, a state becomes obsessed with its political and military prestige, and vulnerable to the claim that "small" wars must be fought in the hope of deterring large ones. This is especially true when the actual strategic value of these allies is modest.A third cost of these alliances is the commitment to nuclear war that they embody. We understood this during the Cold War, but no one discusses this anymore. Europe's principal potential challenger is Russia; Japan's is China; South Korea's is North Korea. To defend these regions or countries from their most plausible challengers, and to deter attack, the United States must convince those challengers that it would, if pressed, wage nuclear war on their behalf. (The difficulty of making its nuclear-escalation commitments plausible further tempts America to fight 'small' wars to build credibility.) Are these nuclear commitments strategically necessary? During the Cold War, at the margin, one could make the argument that they were. We did not want to see what the Soviet Union might extract from rich European states or Japan by way of extra resources, if it could cow or conquer them, and convert their economic assets into military power. Today, however, it is hard to argue that any of the challengers that these countries face today are capable of conquering these allies, or coercing them into making great contributions to the challenger's military war chest. The United States assumes nuclear risks in the absence of a clear case for doing so. To offer an extreme example, the Baltic states are members of NATO. The United States is committed to their defense if they are challenged by Russia. These states cannot defend themselves conventionally, and because of the peculiarities of their geography, neither can the United States (This was seldom discussed when these states were brought into NATO in the George W. Bush administration.) I believe that a full fledged Russian challenge over the Baltics is unlikely, but were it to occur the United States could face the alternative of a potentially irreversible military defeat or a dramatic and dangerous nuclear crisis. Finally, these alliance commitments create a special kind of "moral hazard." The extravagant insurance that we offer these countries encourages them to engage in risky behavior. For the Europeans and Japanese, this consists of buying too little military insurance for themselves. Their defense budgets are too small even to sustain their present force structures. U.S. defense secretaries from both parties dutifully chide allies for their shortfalls and then go on to ignore them as we move to provide more security welfare. In NATO, for example, all but four of the allies fail to spend 2 percent of GDP on defense, an alliance commitment, while the United States spends 3 percent excluding war costs. (Germany, the fourth-most-productive economy in the world and the NATO ally best placed to assist the Baltic states, spends barely 1.2 percent.) Yet in the face of European concerns about Russian adventurism, the United States has rushed into the breach with five billion dollars of additional spending on European security over the last three fiscal years, which the Pentagon smuggled into the budget for Overseas Contingency Operations, whose purpose is to pay for actual unexpected war costs, and which therefore escapes the scrutiny of normal budget politics.

#### Heg causes war – best data – the Middle East and hard power investments prove.

Fettweis ‘17 (Christopher J, \*Associate Professor of Political Science at Tulane University, Ph.D. from the University of Maryland, College Park, “Unipolarity, Hegemony, and the New Peace,” Security Studies 26:3, 423-451)//cmr

Overall US interest in the affairs of the Global South has dropped markedly since the end of the Cold War, as has the level of violence in almost all regions. There is less US intervention in the political and military affairs of Latin America compared to any time in the twentieth century, for instance, and also less conflict. Warfare in Africa is at an all-time low, as is relative US interest outside of counterterrorism and security assistance.66 Regional peace and stability exist where there is US active intervention, as well as where there is not. No direct relationship seems to exist across regions. If intervention can be considered a function of direct and indirect activity, of both political and military action, a regional picture might look like what is outlined in Table 1. These assessments of conflict are by necessity relative, because there has not been a “high” level of conflict in any region outside the Middle East during the period of the New Peace. Putting aside for the moment that important caveat, some points become clear. The great powers of the world are clustered in the upper right quadrant, where US intervention has been high, but conflict levels low. US intervention is imperfectly correlated with stability, however. Indeed, it is conceivable that the relatively high level of US interest and activity has made the security situation in the Persian Gulf and broader Middle East worse. In recent years, substantial hard power investments (Somalia, Afghanistan, Iraq), moderate intervention (Libya), and reliance on diplomacy (Syria) have been equally ineffective in stabilizing states torn by conflict. While it is possible that the region is essentially unpacifiable and no amount of police work would bring peace to its people, it remains hard to make the case that the US presence has improved matters. In this “strong point,” at least, US hegemony has failed to bring peace. In much of the rest of the world, the United States has not been especially eager to enforce any particular rules. Even rather incontrovertible evidence of genocide has not been enough to inspire action. Washington’s intervention choices have at best been erratic; Libya and Kosovo brought about action, but much more blood flowed uninterrupted in Rwanda, Darfur, Congo, Sri Lanka, and Syria. The US record of peacemaking is not exactly a long uninterrupted string of successes. During the turn-of-the-century conventional war between Ethiopia and Eritrea, a highlevel US delegation containing former and future National Security Advisors (Anthony Lake and Susan Rice) made a half-dozen trips to the region, but was unable to prevent either the outbreak or recurrence of the conflict. Lake and his team shuttled back and forth between the capitals with some frequency, and President Clinton made repeated phone calls to the leaders of the respective countries, offering to hold peace talks in the United States, all to no avail.67 The war ended in late 2000 when Ethiopia essentially won, and it controls the disputed territory to this day. The Horn of Africa is hardly the only region where states are free to fight one another today without fear of serious US involvement. Since they are choosing not to do so with increasing frequency, something else is probably affecting their calculations. Stability exists even in those places where the potential for intervention by the sheriff is minimal. Hegemonic stability can only take credit for influencing those decisions that would have ended in war without the presence, whether physical or psychological, of the United States. It seems hard to make the case that the relative peace that has descended on so many regions is primarily due to the kind of heavy hand of the neoconservative leviathan, or its lighter, more liberal cousin. Something else appears to be at work.

#### Framing issue – their authors have been bamboozled by imperialist propaganda.

Fettweis ‘17 (Christopher J, \*Associate Professor of Political Science at Tulane University, Ph.D. from the University of Maryland, College Park, “Unipolarity, Hegemony, and the New Peace,” Security Studies 26:3, 423-451)//cmr

The Political Psychology of Unipolarity Evidence supporting the notion that US power is primarily responsible for the New Peace is slim, but belief in the connection is quite strong, especially in policy circles. The best arena to examine the proposition is therefore not the world of measurable rationality, but rather that of the human mind. Political psychology can shed more light on unipolarity than can any collection of data or evidence. Just because an outcome is primarily psychological does not mean that it is less real; perception quickly becomes reality for both the unipolar state and those in the periphery. If all actors believe that the United States provides security and stability for the system, then behavior can be affected. Beliefs have deep explanatory power in international politics whether they have a firm foundation in empirical reality or not. Like all beliefs, faith in the stability provided by hegemony is rarely subjected to much analysis.79 Although they almost always have some basis in reality, beliefs need not pass rigorous tests to prove that they match it. No amount of evidence has been able to convince some people that vaccines do not cause autism, for example, or that the world is more peaceful than at any time before, or that the climate is changing due to human activity. Ultimately, as Robert Jervis explains, “we often believe as much in the face of evidence as because of it.”80 Facts may change, but beliefs remain the same. When leaders are motivated to act based on unjustified, inaccurate beliefs, folly often follows. The person who decides to take a big risk because of astrological advice in the morning’s horoscope can benefit from baseless superstition if the risk pays off. Probability and luck suggest that successful policy choices can sometimes flow from incorrect beliefs. Far more often, however, poor intellectual foundations lead to suboptimal or even disastrous outcomes. It is worthwhile to analyze the foundations of even our most deeply held beliefs to determine which ones are good candidates to inspire poor policy choices in those who hold them. People are wonderful rationalizers. There is much to be said for being the strongest country in the world; their status provides Americans both security and psychological rewards, as well as strong incentives to construct a rationale for preserving the unipolar moment that goes beyond mere selfishness. Since people enjoy being “number one,” they are susceptible to perceiving reality in ways that brings the data in line with their desires. It is no coincidence that most hegemonic stability theorists are American. 81 Perhaps the satisfaction that comes with being the unipolar power has inspired Americans to misperceive the positive role that their status plays in the world. Three findings from political psychology can shed light on perceptions of hegemonic stability. They are mutually supportive, and, when taken together, suggest that it is likely that US policymakers overestimate the extent to which their actions are responsible for the choices of others. The belief in the major US contribution to world peace is probably unjustified. The Illusion of Control Could 5 percent of the world’s population hope to enforce rules upon the rest? Would even an internationally hegemonic United States be capable of producing the New Peace? Perhaps, but it also may be true that believers in hegemonic stability may be affected by the very common tendency of people to overestimate their ability to control events. A variety of evidence has accumulated over the past forty years to support Ellen J. Langer’s original observations about the “illusion of control” that routinely distorts perception.82 Even in situations where outcomes are clearly generated by pure chance, people tend to believe that they can exert control over events.83 There is little reason to believe that leaders are somehow less susceptible to such illusions than subjects in controlled experiments. The extensive research on the illusion of control has revealed two further findings that suggest US illusions might be even stronger than average. First, misperceptions of control appear to be correlated with power: individuals with higher socioeconomic status, as well as those who are members of dominant groups, are more likely to overestimate their ability to control events.84 Powerful people tend to be far more confident than others, often overly so, and that confidence leads them to inflate their own importance.85 Leaders of superpowers are thus particularly vulnerable to distorted perceptions regarding their ability to affect the course of events. US observers had a greater structural predisposition than others, for example, to believe that they would have been able to control events in the Persian Gulf following an injection of creative instability in 2003. The skepticism of less powerful allies was easily discounted. Second, there is reason to believe that culture matters as well as power. People from societies that value individualism are more likely to harbor illusions of control than those from collectivist societies, where assumptions of group agency are more common. When compared to people from other parts of the world, Westerners tend to view the world as “highly subject to personal control,” in the words of Richard Nisbett.86 North Americans appear particularly vulnerable in this regard.87 Those who come from relatively powerful countries with individualistic societies are therefore at high risk for misperceiving their ability to influence events. For the United States, the illusion of control extends beyond the water’s edge. An oft-discussed public good supposedly conferred by US hegemony is order in those parts of the world uncontrolled by sovereign states, or the “global commons.” 88 One such common area is the sea, where the United States maintains the only true blue-water navy in the world. That the United States has brought this peace to the high seas is a central belief of hegemonic-stability theorists, one rarely examined in any serious way. Indeed the maritime environment has been unusually peaceful for decades; the biggest naval battles since Okinawa took place during the Falklands conflict in 1982, and they were fairly minor.89 If hegemony is the key variable explaining stability at sea, maritime security would have to be far more chaotic without the US Navy. It is equally if not more plausible to suggest, however, that the reason other states are not building blue-water navies is not because the United States dissuades them from doing so but rather because none feels that trade is imperiled.90 In earlier times, and certainly during the age of mercantilism, zero-sum economics inspired efforts to cut off the trade of opponents on occasion, making control the sea extremely important. Today the free flow of goods is vital to all economies, and it would be in the interest of no state to interrupt it.91 Free trade at sea may no longer need protection, in other words, because it essentially has no enemies; the sheriff may be patrolling a crime-free neighborhood. The threat from the few remaining pirates hardly requires a robust naval presence, and is certainly not what hegemonic-stability advocates mean when they compare the role played by the US Navy in 2016 to that of the Royal Navy in 1816. It is at least possible that shared interest in open, free commons keeps the peace at sea rather than the United States. Oceans unpatrolled by the US Navy may be about as stable as they are with the presence of its carriers. The degree to which 273 active-duty ships exert control over vast common parts is not at all clear. People overestimate the degree to which they control events in their lives. Furthermore, if these observations from political psychology are right about the factors that influence the growth of illusions of power, then US leaders and analysts are particularly susceptible to misperception. They may well be overestimating the degree to which the United States can affect the behavior of others. The rest of the world may be able to get along just fine, on land and at sea, without US attempts to control it. Ego-Centric and Self-Serving Biases in Attribution It is natural for people, whether presidents or commoners, to misperceive the role they play in the thinking process of others. Jervis was the first to discuss this phenomenon, now known as the “ego-centric bias,” which has been put to the test many times since he wrote four decades ago. Building on what was known as “attribution theory,” Jervis observed that actors tend to overestimate their importance in the decisions of others. Rarely are our actions as consequential upon their behavior as we believe them to be.92 This is not merely ego gratification, though that plays a role; actors are simply more conscious of their own actions than the other factors central to the internal deliberations in other capitals. Because people are more likely to remember their contributions to an outcome, they naturally grant themselves more causal weight.93 Two further aspects of the ego-centric bias make US analysts even more susceptible to its effects. First, the bias is magnified when the behavior of others is desirable. People generally take credit for positive outcomes and deflect responsibility for negative ones. This “self-serving bias” is one of the best-established findings in modern psychology, supported by many hundreds of studies.94 Supporters of Ronald Reagan are happy to give him credit for ending the Cold War, for instance, even though evidence that the United States had much influence on Premier Gorbachev’s decision making is scant at best.95 Today, since few outcomes are more desirable than global stability, it stands to reason that perceptions of the New Peace are prime candidates for distortion by ego-centric, self-serving biases. When war breaks out, it is not the fault of US leaders; when peace comes to a region, Washington is happy to take credit. There was for some time a debate among psychologists over just how universal self-serving biases were, or whether their effects varied across cultures. Extensive research has essentially settled the matter, to the extent that academic questions can ever be settled: a direct relationship appears to exist between cultural individualism and susceptibility to the bias, perhaps because of the value individualistic societies place on self-enhancement (as opposed to self-effacement).96 Actors from more collectivist societies tend to have their egos rewarded in different ways, such as through contributions to the community and connections to others. People from Western countries are far more likely to take credit for positive outcomes than those from Eastern, in other words, and subjects in the United States tower over the rest of the West. US leaders are therefore more culturally predisposed to believe that their actions are responsible for positive outcomes like peace. Second, self-perception is directly related to egocentric attributions. Individuals with high self-esteem are more likely to believe that they are at the center of the decision-making process of others than those who think somewhat more modestly. 97 Leaders of any unipolar state may well be more likely to hold their country in high regard, and therefore are more vulnerable to exaggerated egocentric perceptions, than their contemporaries in smaller states. It might not occur to the lead diplomat of other counties to claim, as did Madeleine Albright, that “if we have to use force, it is because we are America; we are the indispensable nation. We stand tall and we see further than other countries into the future.”98 It is not unreasonable to suspect that the US security community may be even more vulnerable to this misperception than the average group of people. For example, many in that community believed that the United States played a decisive role in Vladimir Putin’s decisions regarding Crimea and eastern Ukraine. President Obama’s various critics argued that perceptions of American weakness inspired or even invited Russian aggression. The refusal to act in Syria in particular emboldened Moscow (despite the fact that in 2008, in the face of ample displays of US action in the Middle East, Moscow had proven sufficiently bold to invade Georgia). Other critics suggested that a variety of provocative US behaviors since the end of the Cold War, especially the expansion of NATO and dissolution of the Anti-Ballistic Missile Treaty, poisoned US–Russian relations and led to an increase in Kremlin paranoia and eventually to the invasion.99 So, either through provocative weakness or bullying, we were responsible for their actions. Egocentric misperceptions are so ubiquitous and pervasive that they generate something of a law of political psychology: we are probably less influential in others’ decision making than we think we are. This extends to their decisions to resolve contentious issues peacefully. While it may be natural for US policymakers to interpret their role as crucial in the maintenance of world peace, it is very likely that Washington exaggerates its importance in the decision making of others, and in the maintenance of international stability. The effect of the ego-centric bias may be especially difficult for the unipolar United States to resist, because other countries do regularly take Washington’s position into account before acting. But US leaders—and the people who analyze them—should keep in mind that they are still probably less important to calculations made in other capitals than they believe. They may well be especially unlikely to recognize the possibility that hegemony is epiphenomenal, that it exists alongside, but does not affect, global stability and the New Peace. Overestimated Benevolence After three years in the White House, Ronald Reagan had learned something surprising: “Many people at the top of the Soviet hierarchy were genuinely afraid of America and Americans,” he wrote in his autobiography. He continued: “Perhaps this shouldn’t have surprised me, but it did…I’d always felt that from our deeds it must be clear to anyone that Americans were a moral people who starting at the birth of our nation had always used our power only as a force for good in the world…. During my first years in Washington, I think many of us took it for granted that the Russians, like ourselves, considered it unthinkable that the United States would launch a first strike against them.”100 Reagan is certainly not alone in believing in the essential benevolent image of his nation. While it is common for actors to attribute negative motivations to the behavior of others, it is exceedingly difficult for them to accept that anyone could interpret their actions in negative ways. Leaders are well aware of their own motives and tend to assume that their peaceful intentions are obvious and transparent. Both strains of the hegemonic-stability explanation assume not only that US power is benevolent, but that others perceive it that way. Hegemonic stability depends on the perceptions of other states to be successful; it has no hope to succeed if it encounters resistance from the less powerful members of the system, or even if they simply refuse to follow the rules. Relatively small police forces require the general cooperation of large communities to have any chance of establishing order. They must perceive the sheriff as just, rational, and essentially nonthreatening. The lack of balancing behavior in the system, which has been puzzling to many realists, seems to support the notion of widespread perceptions of benevolent hegemony.101 Were they threatened by the order constructed by the United States, the argument goes, smaller states would react in ways that reflected their fears. Since internal and external balancing accompanied previous attempts to achieve hegemony, the absence of such behavior today suggests that something is different about the US version. Hegemonic-stability theorists purport to understand the perceptions of others, at times better than those others understand themselves. Complain as they may at times, other countries know that the United States is acting in the common interest. Objections to unipolarity, though widespread, are not “very seriously intended,” wrote Kagan, since “the truth about America’s dominant role in the world is known to most observers. And the truth is that the benevolent hegemony exercised by the United States is good for a vast portion of the world’s population.” 102 In the 1990s, Russian protests regarding NATO expansion—though nearly universal—were not taken seriously, since US planners believed the alliance’s benevolent intentions were apparent to all. Sagacious Russians understood that expansion would actually be beneficial, since it would bring stability to their western border.103 President Clinton and Secretary of State Warren Christopher were caught off guard by the hostility of their counterparts regarding the issue at a summit in Budapest in December 1994.104 Despite warnings from the vast majority of academic and policy experts about the likely Russian reaction and overall wisdom of expansion itself, the administration failed to anticipate Moscow’s position. 105 The Russians did not seem to believe American assurances that expansion would actually be good for them. The United States overestimated the degree to which others saw it as benevolent. Once again, the culture of the United States might make its leaders more vulnerable to this misperception. The need for positive self-regard appears to be particularly strong in North American societies compared to elsewhere.106 Western egos tend to be gratified through self-promotion rather than humility, and independence rather than interdependence. Americans are more likely to feel good if they are unique rather than a good cog in society’s wheel, and uniquely good. The need to be perceived as benevolent, though universal, may well exert stronger encouragement for US observers to project their perceptions onto others. The United States almost certainly frightens others more than its leaders perceive. A quarter of the 68,000 respondents to a 2013 Gallup poll in sixty-five countries identified the United States as the “greatest threat to world peace,” which was more than three times the total for the second-place country (Pakistan).107 The international community always has to worry about the potential for police brutality, even if it occurs rarely. Such ungratefulness tends to come as a surprise to US leaders. In 2003, Condoleezza Rice was dismayed to discover resistance to US initiatives in Iraq: “There were times,” she said later, “that it appeared that American power was seen to be more dangerous than, perhaps, Saddam Hussein.”108 Both liberals and neoconservatives probably exaggerate the extent to which US hegemony is everywhere secretly welcomed; it is not just petulant resentment, but understandable disagreement with US policies, that motivates counterhegemonic beliefs and behavior. To review, assuming for a moment that US leaders are subject to the same forces that affect every human being, they overestimate the amount of control they have over other actors, and are not as important to decisions made elsewhere as they believe themselves to be. And they probably perceive their own benevolence to be much greater than do others. These common phenomena all influence US beliefs in the same direction, and may well increase the apparent explanatory power of hegemony beyond what the facts would otherwise support. The United States is probably not as central to the New Peace as either liberals or neoconservatives believe.

#### Only restraint solves nuke war BUT the transition would be peaceful and create more resilient global governance, which is goldilocks and balances security with cohesion – that straight turns every answer

Pampinella 19 [Stephenis Assistant Professor of Political Science and International Relations at the State University of New York (SUNY) at New Paltz. 1/23. "The Internationalist Disposition and US Grand Strategy." https://thedisorderofthings.com/2019/01/23/the-internationalist-disposition-and-us-grand-strategy/]

A concert strategy can do what establishment foreign policy cannot, namely de-escalate great power competition by giving up US hegemony. If adopted, the United States would treat other great powers, like Russia, China, and Iran, as equal partners in the maintenance of global stability and incorporate their interests into regional security agreements. The United States would give up its self-assumed role as an unrivaled global hegemon and seek a balance of power based on mutual respect with other great powers as partners rather than enemies. This kind of international posture would result in a more horizontal great power system, one that Stacie Goddard as identified as being productive of status quo rather than revisionist intentions. It would be compatible with recognition of the great power identities of other states and provide them with ontological security.

Transitioning from a hegemonic security strategy to a balance of power one will require that the United States engage in some degree of retrenchment from its already expansive commitments. But supporters of hegemony are wrong when they claim that retrenchment will encourage great power aggression and lead to the abandonment of our allies. The United States can engage in moderate forms of retrenchment consistent with great power recognition while still maintaining commitments to allies that strive to uphold human dignity. For example, were the United States to support a moratorium on NATO expansion, as Michael O’Hanlon suggests, it would signal that the United States is no longer interested in moving the frontiers of its influence to the gates of Moscow and remove the sense of threat experienced by Russian leaders. By recognizing the validity of Russian security interests as well as its great power identity, the equal relationship made possible by a concert strategy will better deal with the threat of interstate conflict compared to US hegemony.

Reviving Global Governance

A concert strategy informed by the internationalist disposition can further enable more robust forms of global governance. Rather than attempt international cooperation based on a priori liberal normative templates, the United States would accept the validity of all claims made by collective actors in world politics in an open-ended and inclusive process of deliberation. The result would be less of a hegemonic order and more of a constitutionalist one, in which the United States binds itself to a truly democratic process of decision-making at the global level. The emergence of global governance norms would be a function less of hegemonic socialization and more of a right held by all actors to contest the validity of standards of expected behavior. In other words, a concert strategy would enable the United States to accept processes of norm contestation as the motor of transnational cooperation and generate more legitimate rules for regulating global governance. It would expand the US order building project initially identified by Ikenberry on the basis of restraint and institutional self-binding, but without retaining its own hierarchical position in world politics or engaging in hypocritical forms of dominance.

#### No heg impact

* empirics and political psychology prove US posture is unrelated to great power peace
* other factors aren’t accounted for in their analysis

Fettweis 17 [Christopher Fettweis, associate professor of political science at Tulane University. Unipolarity, Hegemony, and the New Peace. May 8, 2017. http://www.tandfonline.com/doi/pdf/10.1080/09636412.2017.1306394?needAccess=true]

After three years in the White House, Ronald Reagan had learned something surprising: “Many people at the top of the Soviet hierarchy were genuinely afraid of America and Americans,” he wrote in his autobiography. He continued: “Perhaps this shouldn’t have surprised me, but it did … I’d always felt that from our deeds it must be clear to anyone that Americans were a moral people who starting at the birth of our nation had always used our power only as a force for good in the world…. During my first years in Washington, I think many of us took it for granted that the Russians, like ourselves, considered it unthinkable that the United States would launch a first strike against them.” 100 Reagan is certainly not alone in believing in the essential benevolent image of his nation. While it is common for actors to attribute negative motivations to the behavior of others, it is exceedingly difficult for them to accept that anyone could interpret their actions in negative ways. Leaders are well aware of their own motives and tend to assume that their peaceful intentions are obvious and transparent.

Both strains of the hegemonic-stability explanation assume not only that US power is benevolent, but that others perceive it that way. Hegemonic stability depends on the perceptions of other states to be successful; it has no hope to succeed if it encounters resistance from the less powerful members of the system, or even if they simply refuse to follow the rules. Relatively small police forces require the general cooperation of large communities to have any chance of establishing order. They must perceive the sheriff as just, rational, and essentially nonthreatening. The lack of balancing behavior in the system, which has been puzzling to many realists, seems to support the notion of widespread perceptions of benevolent hegemony.101 Were they threatened by the order constructed by the United States, the argument goes, smaller states would react in ways that reflected their fears. Since internal and external balancing accompanied previous attempts to achieve hegemony, the absence of such behavior today suggests that something is different about the US version.

Hegemonic-stability theorists purport to understand the perceptions of others, at times better than those others understand themselves. Complain as they may at times, other countries know that the United States is acting in the common interest. Objections to unipolarity, though widespread, are not “very seriously intended,” wrote Kagan, since “the truth about America’s dominant role in the world is known to most observers. And the truth is that the benevolent hegemony exercised by the United States is good for a vast portion of the world’s population.” 102 In the 1990s, Russian protests regarding NATO expansion—though nearly universal—were not taken seriously, since US planners believed the alliance’s benevolent intentions were apparent to all. Sagacious Russians understood that expansion would actually be beneficial, since it would bring stability to their western border.103 President Clinton and Secretary of State Warren Christopher were caught off guard by the hostility of their counterparts regarding the issue at a summit in Budapest in December 1994.104 Despite warnings from the vast majority of academic and policy experts about the likely Russian reaction and overall wisdom of expansion itself, the administration failed to anticipate Moscow’s position.105 The Russians did not seem to believe American assurances that expansion would actually be good for them. The United States overestimated the degree to which others saw it as benevolent.

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In the end, what can be said about the relationship between US power and international stability? Probably not much that will satisfy partisans, and the pacifying virtue of US hegemony will remain largely an article of faith in some circles in the policy world. Like most beliefs, it will remain immune to alteration by logic and evidence. Beliefs rarely change, so debates rarely end.

For those not yet fully converted, however, perhaps it will be significant that corroborating evidence for the relationship is extremely hard to identify. If indeed hegemonic stability exists, it does so without leaving much of a trace. Neither Washington’s spending, nor its interventions, nor its overall grand strategy seem to matter much to the levels of armed conflict around the world (apart from those wars that Uncle Sam starts). The empirical record does not contain strong reasons to believe that unipolarity and the New Peace are related, and insights from political psychology suggest that hegemonic stability is a belief particularly susceptible to misperception. US leaders probably exaggerate the degree to which their power matters, and could retrench without much risk to themselves or the world around them. Researchers will need to look elsewhere to explain why the world has entered into the most peaceful period in its history.

The good news from this is that the New Peace will probably persist for quite some time, no matter how dominant the United States is, or what policies President Trump follows, or how much resentment its actions cause in the periphery. The people of the twenty-first century are likely to be much safer and more secure than any of their predecessors, even if many of them do not always believe it.

## China

#### China rise is peaceful

* China seeks limited predation not outright competition
* Strategy and policy moves show coop over conflict
* Care most about stability
* No evidence they are focused on heg – leaders understand risks of competition

Shifrinson 19 [Joshua Shifrinson is an Assistant Professor of International Relations with the Pardee School of Global Affairs at Boston University. Should the United States Fear China’s Rise? Winter 2019. www.bu.edu/pardeeschool/files/2019/01/Winter-2019\_Shifrinson\_0.pdf]

In short, limited predation—not an overt and outright push to overtake and challenge the United States—is the name of China’s current and highly rational game. As significantly, it appears Chinese leaders are aware of the structural logic of the situation. Despite ongoing debate over the extent to which China has departed from its long-standing “hide strength, bide time” strategy first formulated by Deng Xiaoping in favor a more assertive course seeking to increase Chinese influence in world affairs, Chinese leaders and China watchers have been at pains to point out that Chinese strategy still seeks to avoid provoking conflict with the United States.49 As one analyst notes, China’s decision to carve out a more prominent role for itself in world politics has been coupled with an effort to reassure and engage the United States so as to avoid unneeded competition while facilitating stability.50 Chinese leaders echo these themes, with one senior official noting in 2014 that Chinese policy focused on “properly addressing] conflicts and differences through dialogue and cooperation instead of confrontational approaches.”51 Xi Jinping himself has underlined these currents, arguing even before taking office that U.S.-Chinese relations should be premised on “preventing conflict and confrontation,” and more recently vowing that “China will promote coordination and cooperation with other major countries.”52 Ultimately, as one scholar observes, there is “hardly evidence that [... China has] begun to focus on hegemonic competition.”53 Put another way, China’s leaders appear aware of the risks of taking an overly confrontational stance toward a still-potent United States and have scoped Chinese ambitions accordingly.

#### China’s not evil

Ambrosio et al. 19 -\*professor of political science in the Criminal Justice and Political Science Department at North Dakota State University, [Thomas Ambrosio, Carson Schram, Professor of Political Science at North Dakota State University and teaches courts on international politics and international law & Preston Heopfne, Department of Political Science, North Dakota State University, The American securitization of China and Russia: U.S. geopolitical culture and declining unipolarity, 2019, Eurasian Geography and Economics, DOI: 10.1080/15387216.2019.1702566, DKP]

China

America’s post-Cold War China threat narrative has evolved significantly into one in which China’s growing capabilities have complemented its ambition to establish itself both as a great power with regional dominance and as a global actor – all in the service of transforming the current world order. As seen in Figure 1, 9 which illustrates the overall percentages of references in terms of source of threat, the China threat has been defined in aggregate by capabilities, either by itself or in combination with another source. Indeed, 44.6% of all references to the China threat defined it exclusively in terms of capabilities – i.e. not combined with any other source. One reason is that nearly 39% of all references were about China’s nuclear weapons or growing conventional assets. However, the aggregate view can be misleading, as seen in Figure 2, which details the data from Figure 1 annually. It shows that there were five distinct periods in which references to intentions spiked: 1996-1998, 2001, 2010, 2012, and 2018–2019.10 These corresponded to points of punctuation in which the

A picture containing timeline

Description automatically generated

threat narrative notably intensified, indicating that Chinese actions helped to significantly drive it.

Fueled by its rapid economic growth, strategic geographic location, and large population, China was recognized early as being well-placed to have a greater impact on the regional and world stages. The primary theme of the initial narrative was about China’s potential power. However, whether it would constitute a threat to U.S. interests and the region was placed primarily on the Chinese government and how it would employ its newfound power – that is, whether it would actively seek to undermine American regional dominance. In 1995, for example, China was noted as the chief exception to the global trend of declining military budgets, but special emphasis was placed on how it “might use its military forces” (S.Hrg.104-15 1995, 33). Specifically, “the rapid growth in China’s material strength has raised the importance of China in the Asian security equation” and the “peace, stability, and economic growth in the AsiaPacific region” was, in large part, dependent upon whether China sought friendly relations with its neighbors (S.Hrg.104-15 1995, 43). At this point, the notion that China could threaten American global position and the world order was not discussed. Instead, the possibility only was that China could use its rising power to challenge the regional order.

A significant intensification of the China threat narrative accompanied the Third Taiwan Strait Crisis of 1995–1996, in which China conducted a series of missile tests in waters surrounding Taiwan and mobilized its military across the strait. As seen in Figure 3, which illustrates China’s role in triggering regional instability within East-Asia as a percentage of annual references, there was a significant increase in this issue during the 1996 and 1997 hearings. This crisis was generated in response to a visit to the U.S. by Taiwan’s president, which the Chinese government considered an unacceptable symbolic act of American support for the more independence-leaning leader, and in the context of Taiwan’s 1996 election, in which he was standing for reelection. The U.S. eventually responded by sending two carrier battle groups to the area. The consequences of this crisis were still unfolding when the 1996 threat hearing was held, and it was the first time in which China was described as actually “threatening” and “serious questions” were raised “about Beijing’s intentions” and regional goals (S.Hrg.104- 510 1996, 5). Chinese “saber-rattling” was placed in the context of its preparations for “local and limited conflicts,” which ran counter to China’s claims that it sought constructive relations with its neighbors (S.Hrg.104-510 1996, 47). The reasons for its actions were not provided in the testimony nor were its concerns over Taiwan given any legitimacy. This narrative direction continued in 1997, with greater attention paid to China’s potential, and negative, impact in Asia-Pacific should it choose to become “more assertive and aggressive” (S.Hrg.105-201 1997, 16). The implication of this testimony was that the success of America’s policy of engagement with China was ultimately dependent upon Chinese intentions and not American policy.

Given China’s policies vis-à-vis Taiwan, it is perhaps not surprising that its great power ambitions and revisionist goals were first introduced in 1996 and became recurring themes in American depictions of China over the next several years. By 2001, Chinese ambitions were described as having “come sharply into focus” and “one of the toughest challenges we face” (S.Hrg.107-2 2001, 10). As seen in Figure 3, over 11% of these reports, on average, referenced China’s great power

Chart

Description automatically generated with medium confidence

ambitions in the decade following 1996. Significantly, this impulse stemmed from internal sources: a nationalist impulse to “[redress] what it often proclaims as a hundred years of humiliation at the hands of Western powers” (S.Hrg.106-580 2000, 18);“a centuries-old quest for national wealth and power” (S.Hrg.107-2 2001, 28); and, domestic politics amongst Communist Party elites who feel “obliged to avoid any hint of being soft on the United States” (S.Hrg.107-597 2002, 134).11 This desire ultimately manifested itself in China’s goal to establish itself as the dominant power in East Asia (S.Hrg.107-2 2001, 28). U.S. officials framed China’s economic growth, military spending, and desire for a sphere of influence as connected to, and in many ways a direct consequence of, its great power ambitions, which largely emerged from internal Chinese dynamics.

This narrative was also connected to one which described China as a revisionist power, with a commitment to a “multipolar world” – a phrase which was first used in regard to China in 2000 (S.Hrg.106-580 2000, 7). This goal rejected the U.S.-led unipolar international system and sought to establish a new geopolitical architecture. This assessment of Chinese goals can, in large part, explain why the China threat narrative again spiked in 2001: China was expected to consistently “attempt to limit or forestall American unilateral or US led actions judged adverse to China’s own interests because they seem to strengthen and perpetuate a unipolar world” (S.Hrg.107-2 2001, 28). This new narrative was important because it rearticulated the China threat as directly inimical to America’s global position. While officials recognized that China saw the U.S. as its primary impediment to achieving regional goals, there was no acknowledgment from the U.S. side that its policies were in any way responsible. Furthermore, there was no sense that China had a legitimate concern regarding American unilateralism or its forward military positioning along China’s periphery. Rather, the implication was that Beijing’s perceptions were simply incorrect.

While these themes were repeated during hearings over the first decade of the 2000s, there was a lull in the amount of attention paid to China at this time associated with America’s preoccupation with the Global War on Terrorism. For example, there were only a few score references to China across all reports submitted in 2007, and these were almost entirely focused on recounting China’s conventional and nuclear capabilities. But, after China became far more active in the South China Sea around 2008 and as the U.S. moved further away from 9/11, there was a meaningful intensification in the China threat narrative. The Obama administration’s intention to refocus U.S. foreign policy away from the Middle East and toward the Asia-Pacific region through the so called “pivot” also played a key role in this narrative shift as a means to justify it (Ambrosio et al. 2018).

Thus, the China threat narrative which developed around this time depicted China as a far more active, confident threat, which was willing to assert its great power ambitions regionally and even extra-regionally – the latter reflected its growing engagement with Africa and Latin America (S.Hrg.110-634 2008, 28). Accordingly, China was characterized as dedicated to “assertive . . . behavior” and becoming “a more imposing and potentially difficult international actor” in the future (S.Hrg.112-159 2011, 16). This wider focus was backed by a military which (a)energetically sought to counter America’s military advantages in the region, to the point that it was beginning to emerge as a peer competitor, at least regionally; (b)adopted “an offensive operational [military] doctrine” and “possible preemptive action;” and, (c)was building the capacity to act extraregionally in support of its broader great power interests, such as establishing naval facilities in the Indian Ocean (S.Hrg.110-634 2008, 43). These actions were portrayed as ultimately connected to overturning America’s global position.

This increased threat narrative was evidenced by the 2010 spike in references to China’s great power ambitions, as seen in Figure 3, where nearly a third of all references to China mentioned these designs. This overall characterization was reinforced by an increased focus on Chinese actions in the South China Sea, with references to intentions reaching a high-point in 2012 (see Figure 2). Furthermore, China was depicted as a multifaceted threat dedicated to expanding its geographic profile, with an increased willingness to undertake cyberspace and foreign intelligence operations against the U.S., and prepared for conflicts in which space/counterspace capabilities would prove crucial. Over the next decade, each of these themes continued, becoming significantly more serious as U.S. perceptions of great power threat became central to the American narrative in the latter half of the 2010

## 1nc starlink

#### 1] Squo solves debris – private tracking, surveillance, in-orbit servicing and green satellite tech all happening now – includes starlink

CSTP 20 – OECD Committee, The strategic objectives of the Committee as defined in its Mandate and by the work priorities agreed by Member countries' Ministers responsible for science and technology provide the framework for the Secretariat's proposals for activities to be developed or initiated under the aegis of the Committee itself or its subsidiary bodies (NESTI, TIP, GSF, BNCT and IPSO) [This paper was approved and declassified by written procedure by the Committee for Scientific and Technological Policy (CSTP) on 11 March 2020 and prepared for publication by the OECD Secretariat, “SPACE SUSTAINABILITYTHE ECONOMICS OF SPACE DEBRIS IN PERSPECTIVE,” OECD Science, Technology and Industry Policy Papers, April 2020, No. 87, https://www.oecd-ilibrary.org/science-and-technology/space-sustainability\_a339de43-en]

An emerging “space debris economy”?

* Will we see a more intensive use of cubesats and miniaturised technologies in lower orbits? Cubesats have been the fastest-growing category of launched satellites in the last years and, when launched at lower altitudes, are naturally compliant with debris mitigation guidelines. They are also ever more performant and affordable, and dedicated launch opportunities become more widespread. Furthermore, they increasingly receive preferential treatment in risk-based national legislations (e.g. introduction of sliding scale in the UK Outer Space Act for insurance requirements).
* Space surveillance and tracking capabilities, in both GEO and LEO: New (private) sources of situational awareness data are becoming increasingly important, with data analytics and modelling fuelled by advances in digital technologies. Private sector debris catalogues and tracking capabilities for the geostationary orbit may now be almost as good as government capabilities (IDA, 2016[76]), while solutions for the low-earth orbit are emerging. Start-ups such as LeoLabs provide data and services based on low-cost ground equipment and sophisticated data analysis. The company, which in October 2019 had three radars in the United States and New Zealand, has developed a cloud-based “Space Regulatory and Sustainability Platform” for the New Zealand Space Agency, a first of its kind, destined to track objects launched from New Zealand to ensure compliance with permit conditions (MBIE, 2019[77]). A novel project called TruSat intends to use blockchain technology to crowdsource and validate satellite orbital positions worldwide via open source software (TruSat, 2019[78]). The US Air Force Research Laboratory has signed agreements with several commercial space situational awareness data providers (e.g. Numerica, LeoLabs, ExoAnalytics) to get access to sensor networks and algorithms (Numerica, 2019[79]). The Space Situational Awareness (SSA) open-architecture data-sharing platform under development by the US Department of Commerce, including data from different government agencies, is also expected to spur innovative value-added products and services.
* In-orbit servicing solutions: Several governmental agencies and commercial companies have developed, or are in the process of acquiring, some capabilities for in-orbit servicing (e.g. NASA, DARPA, ESA, JAXA). In-orbit servicing involves a number of complex operations in space: the servicing of space platforms (e.g. satellite, space station) to replenish consumables and degradables (e.g. propellants, batteries, solar array); replacing failed functionality; and/or enhancing the mission through software and hardware upgrades. This is a major challenge as, when on orbit, space platforms can move at speeds of several kilometres a minute. The first commercial in-orbit servicing mission was launched in 2019, by a MEV-1 spacecraft developed by Orbital ATK for an Intelsat geostationary satellite. The main short-term market is seen in the life extension of geostationary satellites, with some 300 potential candidates, at least in theory (Kennedy, 2018[80]). However, the key benefits of in-orbit servicing are expected in the future. Satellite design is currently heavily restricted by extreme launch conditions, but the possibility of servicing could enable a much more flexible and modular satellite design, able to take advantage of the latest advances in materials and electronics, beyond software upgrades (Jaffart, 2018[81]). Market forecasts estimate a USD 3 billion market for in-orbit servicing over the 2017-27 period, mainly driven by life extension services (Northern Sky Research, 2018[82]).
* Active debris removal solutions: Active debris removal is at a less mature technological level, but several firms are preparing demonstration missions (e.g. Astroscale in 2020). Potential candidates for removal include more than 200 critical debris objects (3-9 tonnes); mainly rocket bodies, but also the European Envisat satellite. JAXA, has formally launched a project to remove a large piece of debris by 2025 (a Japanese rocket body) in a public-private partnership (Japanese Delegation to UNCOPUOS, 2019[83]). Both Airbus and Thales Alenia Space are developing in-orbit servicing vehicles with debris removal functions, some of which have been tested on the RemoveDEBRIS mission (Surrey Space Centre, 2019[84]; OECD, 2019[11]).

• “Green” satellite design and technology: The demand for space-environment friendly satellite design is picking up. This includes features to reduce or avoid debris creation (explosion-safe batteries, deorbit technologies) and/or facilitating active removal (e.g. markers or grapple fixtures). One example is OneWeb, which is installing grapple fixtures on their satellites. In Europe, all future Sentinel satellites will be designed for demise. Affordable deorbit technologies are already being tested on orbit. Canada’s three-kilo CanX-7 satellite was launched in 2016 and is currently using its four 1 m2 drag sails to deorbit at a significantly faster rate than it would have without the sails. Amazon’s Kuiper constellation intends to use unpressurised and non-explosive propellant to mitigate accidental explosions, and satellites losing contact with ground control would automatically deactivate themselves, first by self-passivation and orbit-lowering, then depleting all energy reservoirs and switching off charging circuits (FCC, 2019[85]). SpaceX’ Starlink satellites are equipped with automated collision avoidance systems (although it is unclear which role the system played in the near-collision with the ESA Aeolus satellite).

A recent promising initiative is the “Space Sustainability Rating” scheme, originally conceived by teams from the MIT Media Lab, European Space Agency, and World Economic Forum. The initiative intends to be similar to the most widely used green building rating system in the construction industry, called the LEED certification for Leadership in Energy and Environmental Design. The objective is to promote mission designs and operational concepts that mitigate debris creation, and create a label that can encourage operators to behave more responsibly.

#### 2] Starlink ACA systems and de-orbiting solves any debris impact – Russian ASAT test proves and also non-uniques their impact

Kan 21 – [Michael, “Starlink Satellite Orbits Changed to Avoid Debris After Russia's Missile Test,” PC Mag, 12/1/2021, https://www.pcmag.com/news/starlink-satellite-orbits-changed-to-avoid-debris-after-russias-missile]

SpaceX has altered the orbits for its Starlink satellites, likely to prevent them from colliding with debris from Russia’s anti-satellite missile test.

On Tuesday, SpaceX CEO Elon Musk mentioned the issue after NASA abruptly delayed a spacewalk on the International Space Station due to the threat of space debris. In his tweet, Musk said: “We had to shift some Starlink satellite orbits to reduce probability of collision. Not great, but not terrible either.”

Musk didn’t explicitly blame the space debris on Russia’s anti-satellite missile test. Nevertheless, the “Not great, but not terrible” quote may be a subtle jab at the Russian government. The same line is used in the HBO series Chernobyl, which dramatizes the 1986 nuclear plant disaster in the Soviet Union. (In the show, a nuclear plant worker utters the line “Not great, but not terrible,” when in reality the conditions at the facility are catastrophic.)

Last month, the US was quick to condemn Russia’s anti-satellite missile test, which involved the Kremlin sending up a missile to destroy one of its own defunct satellites. The ensuing impact caused hundreds of thousands of pieces of debris to spill out into orbit, according to the US.

Because space debris can travel up to 17,500 miles per hour, even a small artifact can cause serious damage if strikes a spacecraft or an astronaut. "Russia's dangerous and irresponsible behavior jeopardizes the long-term sustainability of outer space,” the US State Department said at the time.

However, Russia claims the resulting debris poses no danger to any space activity. The Kremlin also points out other countries have embarked on their own anti-satellite missile tests too.

To avoid space debris, SpaceX has equipped each Starlink satellite with an “autonomous collision avoidance” system. The same satellites will eventually descend and burn up in Earth’s atmosphere within one to five years if the propulsion system on board ever fails.

In his tweet, Musk added that the International Space Station and SpaceX’s own Dragon craft possess “micrometeorite shields,” which can withstand high-velocity impacts. However, spacesuits lack such protection, hence the need for NASA to cancel the spacewalk.

#### 3] Low altitude orbits zeroes risk of collision and doesn’t contribute to overall debris in dense areas – even if satellites fail no impact

Grush 18 – [Loren, “SpaceX wants to fly some internet satellites closer to Earth to cut down on space trash,” 10/9/2018, <https://www.theverge.com/2018/11/9/18016962/spacex-internet-satellites-space-debris-trash-orbit-closer-earth-distance-atmosphere>]

SpaceX is revising its satellite internet initiative, Starlink, and it now hopes to operate some of its spacecraft at a lower altitude than originally planned. In a new filing to the Federal Communications Commission (FCC), SpaceX is asking the agency to modify its license so that more than 1,500 Starlink satellites can operate at an altitude 600 kilometers lower than the company originally requested.

SpaceX argues that this change will make the space environment safer, as it will be easier to get rid of these satellites at this new altitude when they run low on fuel or can no longer function properly in orbit. This update could also explain the unexpected behavior of two of SpaceX’s test satellites for Starlink, which have remained in lower orbits than expected.

Back in March, the FCC approved SpaceX’s license for the first phase of its ambitious Starlink initiative — the company’s long-term plan to launch nearly 12,000 satellites into orbit to beam internet coverage down to Earth. Initially, SpaceX asked the FCC for permission to launch 4,425 satellites into orbits ranging between 1,110 to 1,325 kilometers high. But with this new filing, SpaceX is requesting that 1,584 of those satellites, which were supposed to operate at 1,110 kilometers, be allowed to operate at 550 kilometers instead.

SpaceX says moving the satellites to a lower altitude means it can do more with less. Originally, the company said it needed 1,600 satellites to operate at the 1,110-kilometer altitude, but moving them lower means the company can get the same results with 16 fewer spacecraft. And the lower altitude makes it easy to dispose of these satellites once they’re done in space. At this height, particles from Earth’s atmosphere bombard the spacecraft more rapidly, pushing them out of orbit and dragging them down to the planet. And on the way down, they burn up in the atmosphere.

Making sure these spacecraft come out of orbit in a timely manner is crucial because of the vast number of vehicles that SpaceX wants to put into orbit. A constellation the size of Starlink could dramatically increase the number of operational satellites in space, raising the risk of in-space collisions. A recent NASA study argued that 99 percent of these satellites will need to be taken out of orbit, reliably, within five years of launch, or the risk of satellite collisions goes up quite a bit.

De-orbiting a satellite typically entails bringing the vehicle to a low enough altitude with thrusters where Earth’s air particles and gravity drag the probe down so that it burns up. Now, with this new filing, SpaceX won’t have to significantly move 1,584 of its satellites to get rid of them. The atmosphere at 550 kilometers should do the job within a few years. That’s also helpful in case the spacecraft fails in orbit. Satellites that fail in higher altitudes could turn into unoperational space debris that stay in orbit for long periods of time. At lower altitudes, they can still fail, and the atmosphere will still swallow them up in a timely manner.

## 1nc hackers

#### 1] Hacking of SATs by the government nonuniques this advantage

#### 2] No one’s going to war over a downed satellite

Bowen 18 [Bleddyn Bowen, Lecturer in International Relations at the University of Leicester. The Art of Space Deterrence. February 20, 2018. https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/]

Space is often an afterthought or a miscellaneous ancillary in the grand strategic views of top-level decision-makers. A president may not care that one satellite may be lost or go dark; it may cause panic and Twitter-based hysteria for the space community, of course. But the terrestrial context and consequences, as well as the political stakes and symbolism of any exchange of hostilities in space matters more. The political and media dimension can magnify or minimise the perceived consequences of losing specific satellites out of all proportion to their actual strategic effect.

#### 3] Won’t go nuclear – seen as a normal conventional attack because of integration with ground forces

Firth 7/1/19 [News Editor at MIT Technology Review, was Chief News Editor at New Scientist. How to fight a war in space (and get away with it). July 1, 2019. MIT Technology Review]

Space is so intrinsic to how advanced militaries fight on the ground that an attack on a satellite need no longer signal the opening shot in a nuclear apocalypse. As a result, “deterrence in space is less certain than it was during the Cold War,” says Todd Harrison, who heads the Aerospace Security Project at CSIS, a think tank in Washington, DC. Non-state actors, as well as more minor powers like North Korea and Iran, are also gaining access to weapons that can bloody the noses of much larger nations in space.

#### 4] States won’t do it and no war

Bragg et al, July 2018 - \*Dr. Allison Astorino-Courtois, NSI’s Chief Analytics Officer (CAO) and Executive Vice President, PhD in IR @ NYU \*\*Dr. Robert Elder, PhD @ Emory, BA @ Clemson, Assistant prof of History @ Baylor \*\*\*Dr. Belinda Bragg, principle research scientist at NSI, Inc. Lecturer in polisci @ Texas A&M.;“Contested Space Operations, Space Defense, Deterrence, and Warfighting: Summary Findings and Integration Report,” NSI, https://nsiteam.com/social/wp-content/uploads/2018/11/Space-SMA-Integration-Report-Space-FINAL.pdf

Everyone needs space

While the US may be relatively more dependent on space for national security than are other states, it is far from alone in relying on space. Nuclear armed states are dependent on space for important command and control functions, and major powers are increasingly using space for battlefield situational awareness and communications. China and Russia were identified as having significant (and fairly equal) levels of strategic risk in space (ViTTa Q16), although their regional security priorities and (to date) less spacedependent economies place them at an advantage to the US. They may, therefore, see the strategic risk of conflict is space as lower than does the US. Still, space capabilities remain a source of economic expansion and national pride for both, and their calculations of the cost of conflict involving space may include consideration of these factors. Even now, there is a general consensus that the US and other actors have more to gain from space than they have from the loss of space-based capabilities (ViTTa Q3). This suggests that, although the US is more vulnerable in the space domain than are other states, the likelihood that aggressive action against an adversary’s space assets would be reciprocated may provide a degree of security. It also creates another incentive for actors to use diplomacy and international law to reduce risk and increase transparency in the space domain.

#### 5] No escalation - If we don’t have sufficient data we move the satellite to ‘lost’ category

Hoots ’15 [Felix; Fall 2015; Distinguished Engineer in the System Analysis and Simulation Subdivision, Ph.D. in Mathematics from Auburn University, M.S. in Mathematics from Tennessee Tech University; Crosslink, “Keeping Track: Space Surveillance for Operational Support,” <https://aerospace.org/sites/default/files/2019-04/Crosslink%20Fall%202015%20V16N1%20.pdf>; RP]

The JSpOC tasks these sensors to track specific satellites and to record data such as time, azimuth, elevation, and range. This data is used to create orbital element sets or state vectors that represent the observed position of the satellite. The observed position can then be compared with the predicted position. The dynamic models used for predicting satellite motion are not perfect; factors such as atmospheric density variation caused by unmodeled solar activity can cause the predicted position to gradually stray from the true position. The observations are used to correct the predicted trajectory so the network can continue to track the satellite. This process of using observations to correct and refine an orbit in an ongoing feedback loop is called catalog maintenance, and it continues as long as the satellite remains in orbit. Ideally, the process is automatic, with manual intervention only required when satellites maneuver or get near to reentry due to atmospheric drag.

Sometimes, however, more effort is required. For example, a sensor may encounter a satellite trajectory that does not correspond well to anything in the catalog. Such observations are known as partially correlated observations if they are somewhat close to a known orbit or uncorrelated observations (or uncorrelated tracks) if they are far from any known orbit. Also, if a satellite is not tracked for five days, it is placed on an attention list for manual intervention. In that case, an analyst will attempt to match the wayward satellite to one of these partially correlated or uncorrelated tracks. If that effort succeeds, then the element sets are updated, and the object is returned to automatic catalog maintenance. On the other hand, if the satellite cannot be matched to a partially correlated or uncorrelated track, the satellite information continues to age. If it reaches 30 days without a match, the satellite is placed on the lost list.

One of the most visible uses of the catalog is to warn about collision risks for active payloads. This function predicts potential close approaches three to five days in advance to allow time to plan avoidance maneuvers, if necessary. Unplanned maneuvers may disturb normal operations and deplete resources for future maneuvers, so one would like to have high confidence in the collision-risk predictions. The reliability of the predictions depends directly on the accuracy of the orbit calculation, which in turn depends on the quality and quantity of the tracking data, which is limited by the capability of the Space Surveillance Network. Simply put, there are not enough tracking resources in the network to achieve high-quality orbits for every object in the catalog. Furthermore, many smaller objects can only be tracked by the most sensitive radars, and this tracking is infrequent. Most objects in the catalog are considered debris, which can neither maneuver nor broadcast telemetry. On the other hand, some satellite operators depend exclusively on the satellite catalog to know where their satellites are, and users of the satellite orbital data depend on the catalog to know when the satellites will be within view.

This situation creates a challenging problem in balancing Space Surveillance Network resources to support the collision-warning task (tracking as many potential hazards as possible) while also providing highly accurate support to operational satellites (tracking the spacecraft as precisely as possible). The practical solution is to perform collision risk assessment using a large screening radius to ensure no close approaches are missed despite lower-quality predictions. Once an object is identified as having a potentially close approach, then the tasking level is raised, with the expectation that more tracking data will be obtained to refine the collision risk calculations. When the danger has passed, the object reverts to a normal tracking level.

Collisions and spontaneous breakups do happen. The first satellite breakup occurred on June 29, 1961, when residual fuel in an Ablestar rocket body exploded, creating 296 trackable pieces of debris. Since that time, there have been more than 200 satellite breakups, the most notable being the missile intercept of the Fengyun-1C satellite, which created more than 3300 trackable fragments. In most cases, these breakups are first detected by the phased-array radars in the Space Surveillance Network. When multiple objects are observed where only one was expected, the downstream sensors are alerted, but no tasking is issued because specific debris orbits are not yet established. Tracks are taken and tagged as uncorrelated. Analysts at JSpOC then attempt to link uncorrelated tracks from different sensors to form a candidate orbit. Subsequent tracking improves the orbit to the point that the object can be named and numbered and moved into the catalog for automatic maintenance.

#### No miscalc – lack of attribution means no retal

Schwarzer et al ’19 [Daniela, Eva-Marie McCormack, and Torben Schutz; Director, Editor, and Associate Fellow in the Security, Defense, and Armaments Program at the German Council of Foreign Relations; Deutsche Gesellschaft fur Auswartige Politik, “Technology and Strategy: The Changing Security Environment in Space Demands New Diplomatic and Military Answers,” [https://www.ssoar.info/ssoar/bitstream/handle/document/63288/ssoar-2019-schutz-Technology\_and\_Strategy\_the\_Changing.pdf](https://www.ssoar.info/ssoar/bitstream/handle/document/63288/ssoar-2019-schutz-Technology_and_Strategy_the_Changing.pdf?sequence=1&isAllowed=y&lnkname=ssoar-2019-schutz-Technology_and_Strategy_the_Changing.pdf);]

However, even a (misinterpreted) threat to space assets could start a chain reaction and quickly escalate an incident in space to a wider war. Successful deterrence, therefore, requires situational awareness, attribution capabilities and resilient assets. Especially the latter two are notoriously difficult to achieve in space. While it might be easy to attribute a kinetic attack executed with a missile, the same is not true for ASAT attacks by other satellites, and, especially, not for cyberattacks and electronic warfare measures. Without clear attribution, however, it is difficult to deter any adversary, since he could speculate that an attack cannot be traced back to him – making deterrence and retaliation more difficult. Although cross-domain deterrence, i.e. threatening an actor through potential retaliation attacks on or by other-than-space assets, is always possible, it also amplifies the problems involved in traditional deterrence: A response has to be timely and proportionate, and it should not further expand of the conflict.

#### Alt cause – glitches

Schwarzer et al ’19 [Daniela, Eva-Marie McCormack, and Torben Schutz; Director, Editor, and Associate Fellow in the Security, Defense, and Armaments Program at the German Council of Foreign Relations; Deutsche Gesellschaft fur Auswartige Politik, “Technology and Strategy: The Changing Security Environment in Space Demands New Diplomatic and Military Answers,” [https://www.ssoar.info/ssoar/bitstream/handle/document/63288/ssoar-2019-schutz-Technology\_and\_Strategy\_the\_Changing.pdf](https://www.ssoar.info/ssoar/bitstream/handle/document/63288/ssoar-2019-schutz-Technology_and_Strategy_the_Changing.pdf?sequence=1&isAllowed=y&lnkname=ssoar-2019-schutz-Technology_and_Strategy_the_Changing.pdf); RP] \*Parentheses in original text

However, space assets can also decrease crisis stability as they are prone to technical glitches. This was, for instance, obvious during the Cold War, when early-warning satellites misinterpreted light reflected from clouds as missile launches. Such misinterpretations nearly led to nuclear exchanges on multiple occasions.

## 1nc satellites

#### 1] Sat attacks don’t cause nuke war

Zarybnisky 18 [Eric J. Zarybnisky, MA in National Security Studies from the Naval War College, PhD in Operations Research from the MIT Sloan School of Management, Lt Col, USAF. Celestial Deterrence: Deterring Aggression in the Global Commons of Space. March 28, 2018. <https://apps.dtic.mil/dtic/tr/fulltext/u2/1062004.pdf>]

PREVENTING AGGRESSION IN SPACE

While deterrence and the Cold War are strongly linked in the public’s mind through the nuclear standoff between the United States and the Soviet Union, the fundamentals of deterrence date back millennia and deterrence remains relevant. Thucydides alludes to the concept of deterrence in his telling of the Peloponnesian War when he describes rivals seeking advantages, such as recruiting allies, to dissuade an adversary from starting or expanding a conflict.6F 6 Aggression in space was successfully avoided during the Cold War because both sides viewed an attack on military satellites as highly escalatory, and such an action would likely result in general nuclear war.7F 7 In today’s more nuanced world, attacking satellites, including military satellites, does not necessarily result in nuclear war. For instance, foreign countries have used highpowered lasers against American intelligence-gathering satellites8F 8 and the United States has been reluctant to respond, let alone retaliate with nuclear weapons. This shift in policy is a result of the broader use of gray zone operations, to which countries struggle to respond while limiting escalation. Beginning with the fundamentals of deterrence illuminates how it applies to prevention of aggression in space.

#### 2] No miscalc from satellite disruptions or ASAT attacks – empirically denied

**Mazur 12** [Jonathan Mazur, Manager Engineering at Northrop Grumman, writing in Space & Defense, from the Eisenhower Center for Space and Defense Studies. Past U.S. Actions: Redlines in Space. Space & Defense, Volume 6, Number 1, Fall 2012. https://inss.ndu.edu/Portals/97/Space\_and\_Defense\_6\_1.pdf?ver=2018-09-06-135424-147]

**U.S. Reactions** To **Foreign Disruption** Of U.S. Capabilities

In the 1970s, it was suspected that a U.S. maritime communications satellite was turned off by the Soviets when it was outside of the range of U.S. tracking stations.25 There does **not** appear to be **any** documented **U.S.** **reaction**, and I suspect there was none. In the mid-1990s, satellite hackers in Brazil began hijacking U.S. military communication satellite signals to broadcast their own information, though it took until 2009 for Brazil to crack down on the illegal activity with the support of the DoD.26 In 1998, a U.S.-German satellite known as ROSAT was rendered useless after it turned suddenly toward the sun. NASA investigators later determined the accident was possibly linked to a cyber-intrusion by **Russia**.

The fallout? Though there was an ongoing criminal investigation as of 2008; NASA **security officials** have seemed **determined** to publicly **minimize** the **seriousness of** **the threat**.27 In 2003, a signal originating from Cuba—later determined to be coming from Iranian embassy property— was jamming a U.S. communications satellite that was transmitting Voice of America programming over Iran, which was publicly **referred to** as an **“act of war”** by a U.S. official. 28 Press reporting indicates the U.S. administration was [frozen]“paralyzed” about how to cope with the jamming that continued for at least a month, even after U.S. diplomatic protests to Cuba.29 In 2005, U.S. diplomats protested to the Libyan government after two international satellites were illegally jammed disrupting American diplomatic, military, and FBI communications.30 In 2006, press reporting indicates that China hit a U.S. spy satellite with a ground-based laser. This action was acknowledged by the then director of the NRO, though the DoD remained tight lipped about the incident.31

“We’re at a point where the **tech**nology**’s** out there, and the capability for people to do things to our satellites is there. I’m focused on it **beyond any single event**.” – **A**ir **F**orce Space Command Commander, General Chilton, 2006 32

In 2009, a U.S. commercial Iridium communications satellite—extensively used by the DoD—was accidently **destroyed** by a collision with a dead **Russian satellite**.33 The U.S. company, Iridium, was able to minimize any loss of service by implementing a network solution within a few days.34 As of early 2011, no legal action had been taken by the company either because it is not clear who was at fault or because it might be politically problematic for the United States, which is trying to enter into bi-lateral transparency and confidence-building measures (TCBM) with Russia regarding space activities.35 Since August of 2010, **No**rth **Ko**rea has been intermittently using **GPS** **jamming** equipment, which reportedly has been interfering with U.S. and **So**uth **Ko**rean military operations and civilian use south of the North Korean border.36 Reportedly, **only** **So**uth **Ko**rea and the **U**nited **N**ations International Telecommunications Union—at the request of South Korea—have issued letters to Pyongyang demanding the cessation of disruptive communications signals in South Korea.37

It appears that the **only time** the **U.S.** military has **responded with force** to a **disruption** in **U.S. space capabilities** was in 2003, a **few days** after the **start of** **the Iraq war**.38 According to U.S. officials, Iraq was using multiple GPS jammers—which supposedly did not affect military GPS functionality. However, the U.S. military bombed the jammers anyway after a diplomatic complaint to Russia.39 The **use** of military **force** against the GPS jamming threat was possibly because the **U**nited **S**tates was **already intervening** **in Iraq**, and the bombing probably **would not have occurred** if the **U**nited **S**tates was **not at war**.

## Impact D - Ozone

#### Timeframe – ozone depletion is super slow and incoherent there’s no brink argument or falsifiable data that explains the brink, 50 years of launches proves resilience

#### Launches inevitable – massive privatization, increasing popularity, other countries thump

Helsinki Times 21 – “Global orbital rocket launches surge by 44% in H1 2021, U.S. leads,” 7/15/2021, https://www.helsinkitimes.fi/business/19596-global-orbital-rocket-launches-surge-by-44-in-h1-2021-u-s-leads.html

Space missions are increasingly becoming popular, with companies moving towards enabling private citizens to have a glimpse of the orbit away from the professional astronauts. The interest in space travel is increasing the number of orbital launches.

Data acquired by Finbold indicates that the global number of orbital rockets launched in 2021 H1 surged 43.9% compared to the first half of 2020.

As of 2021, the orbital rocket launches stood at 59, while last year, the figure was at 41.

In 2021, the United States showed dominance, accounting for about 49% of the launches at 29. China recorded 18 launches, followed by Russia at seven. French space company Arianespace accounts for four orbital launches. The numbers are based on RocketLaunch.live data, which tracks orbital rocket launches worldwide.

Space tourism driving increase in orbital launches

The increase in orbital launches during the period highlights the increasing focus to make space travel a routine. The sector has witnessed the entry of private companies working towards making space travel available for private citizens and not just the professional astronauts of space agencies like NASA.

Worth mentioning is that despite 2020 being a challenging year due to the coronavirus pandemic, several space missions were initiated, with some arriving at their destination in 2021.

The increase in orbital launches also correlates with the entry of private companies into the sector that are jostling to make a name for themselves in space. For instance, Jeff Bezos’ Blue Origin company is expected to have the inaugural space flight with the founder on board on July 20, 2021.

Notably, Virgin Galactic (SPCE) offered a glimpse of space tourism after the company’s aircraft successfully conducted a space mission with founder Sir Richard Branson on board.

Virgin Galactic may begin flying the first paying passengers next year after two more test flights. However, with tickets running into hundreds of thousands of dollars, the space experience remains viable for financially able individuals. But when the companies begin commercial operations, Blue Origin and Virgin Galactic will be direct competitors.

Elsewhere, Elon Musk’s SpaceX is also an active player in the space industry with a reputation for conducting multiple short test flights over the past year. The company’s next step is to reach orbit. Furthermore, competition between private companies is also heating up.

For instance, Arianespace, the world’s first commercial launch company that dominated the market for sending big communications satellites into orbit, is now shifting its focus to smaller satellites. This shift is likely to give companies like SpaceX a run for their money.

#### No ozone impact

**Ridley 14** -- Matthew White Ridley, 5th Viscount Ridley DL FRSL FMedSci, known commonly as Matt Ridley, is a British journalist, businessman and author of popular science books. Since 2013 Ridley has been a Conservative hereditary peer in the House of Lords. “THE OZONE HOLE WAS EXAGGERATED AS A PROBLEM” http://www.rationaloptimist.com/blog/the-ozone-hole-was-exaggerated-as-a-problem.aspx

Serial hyperbole does the environmental movement no favours My recent [Times column](http://www.thetimes.co.uk/tto/opinion/columnists/article4206440.ece) argued that the alleged healing of the ozone layer is exaggerated, but so was the impact of the ozone hole over Antarctica: The ozone layer is healing. Or so said the news last week. Thanks to a treaty signed in Montreal in 1989 to get rid of refrigerant chemicals called chlorofluorocarbons (CFCs), the planet’s stratospheric sunscreen has at last begun thickening again. Planetary disaster has been averted by politics. For reasons I will explain, this news deserves to be taken with a large pinch of salt. You do not have to dig far to find evidence that the ozone hole was never nearly as dangerous as some people said, that it is not necessarily healing yet and that it might not have been caused mainly by CFCs anyway. The timing of the announcement was plainly political: it came on the 25th anniversary of the treaty, and just before a big United Nations climate conference in New York, the aim of which is to push for a climate treaty modelled on the ozone one. Here’s what was actually announced last week, in the words of a Nasa scientist, Paul Newman: “From 2000 to 2013, ozone levels climbed 4 per cent in the key mid-northern latitudes.” That’s a pretty small change and it is in the wrong place. The ozone thinning that worried everybody in the 1980s was over Antarctica. Over northern latitudes, ozone concentration has been falling by about 4 per cent each March before recovering. Over Antarctica, since 1980, the ozone concentration has fallen by [40 or 50 per cent each September](http://bigstory.ap.org/article/scientists-say-ozone-layer-recovering) before the sun rebuilds it. So what’s happening to the Antarctic ozone hole? Thanks to a diligent blogger named Anthony Watts, I came across a press release also from Nasa about nine months ago, which said: “ Two new studies show that signs of recovery are not yet present, and that temperature and winds are still driving any annual changes in ozone hole size.” As recently as 2006, Nasa announced, quoting Paul Newman again, that the Antarctic ozone hole that year was “the largest ever recorded”. The following year a paper in Nature magazine from Markus Rex, a German scientist, presented new evidence that suggested CFCs may be responsible for less than 40 per cent of ozone destruction anyway. Besides, nobody knows for sure how big the ozone hole was each spring before CFCs were invented. All we know is that it varies from year to year. How much damage did the ozone hole ever threaten to do anyway? It is fascinating to go back and read what the usual hyperventilating eco-exaggerators said about ozone thinning in the 1980s. As a result of the extra ultraviolet light coming through the Antarctic ozone hole, southernmost parts of Patagonia and New Zealand see about 12 per cent more UV light than expected. This means that the weak September sunshine, though it feels much the same, has the power to cause sunburn more like that of latitudes a few hundred miles north. Hardly Armageddon. The New York Times reported “an increase in Twilight Zone-type reports of sheep and rabbits with cataracts” in southern Chile. Not to be outdone, Al Gore wrote that “hunters now report finding blind rabbits; fisherman catch blind salmon”. Zoologists briefly blamed the near extinction of many amphibian species on thin ozone. Melanoma in people was also said to be on the rise as a result. This was nonsense. Frogs were dying out because of a fungal disease spread from Africa — nothing to do with ozone. Rabbits and fish blinded by a little extra sunlight proved to be as mythical as unicorns. An eye disease in Chilean sheep was happening outside the ozone-depleted zone and was caused by an infection called pinkeye — nothing to do with UV light. And melanoma incidence in people actually levelled out during the period when the ozone got thinner. Then remember that the ozone hole appears when the sky is dark all day, and over an uninhabited continent. Even if it persists into the Antarctic spring and spills north briefly, the hole allows 50 times less ultraviolet light through than would hit your skin at the equator at sea level (let alone at a high altitude) in the tropics. So it would be bonkers to worry about UV as you sailed round Cape Horn in spring, say, but not when you stopped at the Galapagos: the skin cancer risk is 50 times higher in the latter place. This kind of eco-exaggeration has been going on for 50 years. In the 1960s Rachel Carson said there was an epidemic of childhood cancer caused by DDT; it was not true — DDT had environmental effects but did not cause human cancers. In the 1970s the Sahara desert was said be advancing a mile a year; it was not true — the region south of the Sahara has grown markedly greener and more thickly vegetated in recent decades. In the 1980s acid rain was said to be devastating European forests; not true — any local declines in woodland were caused by pests or local pollution, not by the sulphates and nitrates in rain, which may have contributed to an actual increase in the overall growth rate of European forests during the decade. In the 1990s sperm counts were said to be plummeting thanks to pollution with man-made “endocrine disruptor” chemicals; not true — there was no fall in sperm counts. In the 2000s the Gulf Stream was said to be failing and hurricanes were said to be getting more numerous and worse, thanks to global warming; neither was true, except in a Hollywood studio. The motive for last week’s announcement was to nudge world leaders towards a treaty on climate change by reminding them of how well the ozone treaty worked. But getting the world to agree to cease production of one rare class of chemical, for which substitutes existed, and which only a few companies mainly in rich countries manufactured, was a very different proposition from setting out to decarbonise the whole economy, when each of us depends on burning carbon (and hydrogen) for almost every product, service, meal, comfort and journey in our lives. The true lesson of the ozone story is that taking precautionary action on the basis of dubious evidence and exaggerated claims might be all right if the action does relatively little economic harm. However, loading the entire world economy with costly energy, and new environmental risks based on exaggerated claims about what might in future happen to the climate makes less sense.

### Impact D – No Nuclear Extinction

#### Small arsenals and tests prove no extinction

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Scientific work based on real data, rather than models, also cast additional doubt on the basic premise. Interestingly, publication of several contradictory papers describing experimental observations actually predated Schell’s work. In 1973, nine years before publication of The Fate of the Earth, a published report failed to find any ozone depletion during the peak period of atmospheric nuclear testing.26 In another work published in 1976, attempts to measure the actual ozone depletion associated with Russian megaton-class detonations and Chinese nuclear tests were also unable to detect any significant effect.27 At present, with the reduced arsenals and a perceived low likelihood of a large-scale exchange on the scale of Cold War planning scenarios, official concern over nuclear ozone depletion has essentially fallen off the table. Yet continuing scientific studies by a small dedicated community of researchers suggest the potential for dire consequences, even for relatively small regional nuclear wars involving Hiroshimasize bombs. Nuclear Winter The possibility of catastrophic climate changes came as yet another surprise to Department of Defense scientists. In 1982, Crutzen and Birks highlighted the potential effects of high-altitude smoke on climate,29 and in 1983, a research team consisting of Turco, Toon, Ackerman, Pollack, and Sagan (referred to as TTAPS) suggested that a five-thousand-megaton strategic exchange of weapons between the United States and the Soviet Union could effectively spell national suicide for both belligerents.30 They argued that a massive nuclear exchange between the United States and the Soviet Union would inject copious amounts of soot, generated by massive firestorms such as those witnessed in Hiroshima, into the stratosphere where it might reside indefinitely. Additionally, the soot would be accompanied by dust swept up in the rising thermal column of the nuclear fireball. The combination of dust and soot could scatter and absorb sunlight to such an extent that much of Earth would be engulfed in darkness sufficient to cease photosynthesis. Unable to sustain agriculture for an extended period of time, much of the planet’s population would be doomed to perish, and—in its most extreme rendition—humanity would follow the dinosaurs into extinction and by much the same mechanism.31 Subsequent refinements by the TTAPS authors, such as an extension of computational efforts to three-dimensional models, continued to produce qualitatively similar results. The TTAPS results were severely criticized, and a lively debate ensued between passionate critics of and defenders of the analysis. Some of the technical objections critics raised included the TTAPS team’s neglect of the potentially significant role of clouds;32 lack of an accurate model of coagulation and rainout;33 inaccurate capture of feedback mechanisms;34 “fudge factor” fits of micrometer-scale physical processes assumed to hold constant for changed atmospheric chemistry conditions and uniformly averaged on a grid scale of hundreds of kilometers;35 the dynamics of firestorm formation, rise, and smoke injection;36 and estimates of the optical properties and total amount of fuel available to generate the assumed smoke loading. In particular, more careful analysis of the range of uncertainties associated with the widely varying published estimates of fuel quantities and properties suggested a possible range of outcomes encompassing much milder impacts than anything predicted by TTAPS.37 Aside from the technical issues critics raised, the five-thousand-megaton baseline exchange scenario TTAPS envisioned was rendered obsolete when the major powers decreased both their nuclear arsenals and the average yield of the remaining weapons. With the demise of the Soviet Union, the nuclear winter issue essentially fell off the radar screen for Department of Defense scientists, which is not to say that it completely disappeared from the scientific literature. In the last few years, a number of analysts, including some of the original TTAPS authors, suggested that even a “modest” regional exchange of nuclear weapons—one hundred explosions of fifteenkiloton devices in an Indian–Pakistani exchange scenario—might yet produce significant worldwide climate effects, if not the full-blown “winter.”38 However, such concerns have failed to gain much traction in Department of Defense circles.