## Off

#### Interp – Unjust refers to a negative action – it means contrary.

**Black Laws No Date** "What is Unjust?" <https://thelawdictionary.org/unjust/> //Elmer

**Contrary to right and justice**, or to the enjoyment of his rights by another**, or to the standards of conduct furnished by the laws**.

#### Violation – The Aff is a positive action – it creates a new concept for Space i.e the institution of a band

#### 1] Predictable Limits – The 1ac explodes negative prep burdens insofar as they can institute literally any action that would decrease the use of private space -

#### 2] Ground – wrecks Neg Generics – we can’t say appropriation good since the 1AC can create new views on Outer Space Property Rights that circumvent our Links

#### 3] TVA – just defend that space appropriation is bad.

#### Drop the Debater – A) it’s the only way to deter abuse B) the entire round is now skewed which means that the aff should be punished .

#### Use Competing Interps – A] Reasonability is arbritrary B] Reasonability invites arbitrary judge intervention which the neg cant prep out

#### No RVI’s - A] Forces the 1NC to go all-in on Theory which kills substance education, B] Encourages Baiting since the 1AC will purposely be abusive, and C] Illogical – you shouldn’t win for not being abusive.

## Off

#### Private companies are leading the race to finding life saving resources in space

Brandon A. **Weber,** (Brandon Weber has been writing and creating viral joy on the Innerwebz for over 7 years at [Upworthy](http://www.upworthy.com/brandon-weber), [The Progressive](http://progressive.org/topics/brandon-weber/), [Big Think](https://bigthink.com/experts/brandon-weber), and more. His book on forgotten histories of unions, working people, veterans, and other marginalized people is available on [Barnes & Noble](https://www.barnesandnoble.com/w/class-war-usa-brandon-weber/1126450845#/), [Amazon](http://amzn.to/2xE12e0), [Powell's](http://bit.ly/2kaehh5).), Big Think, 8-16**-2018** ["Space mining is officially a thing, and now there are classes in how to do it", https://bigthink.com/technology-innovation/space-mining-is-officially-a-thing-and-now-there-are-classes-in-how-to-do-it/] SN Accessed 12-29-2021.

While the price tag involved in establishing a human colony on the Moon or Mars is mind-boggling, the costs of sustaining off-Earth colonies and keeping them resupplied indefinitely are even more so — unless the settlements can somehow pay for themselves. Mining for much-needed metals and sending them back to Earth could change the game for space exploration, transforming off-world ventures from prohibitively expensive to financially viable. That being said, bringing a heavy payload of minerals down through Earth’s atmosphere is not currently feasible. Futurists believe that instead, minerals mined in space will be used in space as humanity spreads outwards.

**Rare Earth Materials Are Abundant.** There are around **two million near-earth asteroids** brimming **with rare earth minerals, precious metals, iron, and nickel**. The Moon contains helium-3, yttrium, samarium, and lanthanum, while Mars contains an abundance of magnesium, aluminum, titanium, iron, chromium, and trace amounts of lithium, cobalt, tungsten, and other metals. Importantly, many planetary bodies contain water, which through hydrolysis can be used as rocket fuel.

It Helps with Sustainability. **Earth’s resources are finite. Non-renewable metal resources are** inherently **unsustainable**, and mining causes environmental degradation all over the world. The answer is to source our minerals off-world. Off-world minerals are exhaustible as well, but the argument is that mining lifeless rocks such as the Moon or asteroids is infinitely preferable to continuing to damage Earth’s fragile biosphere.

Discoveries May Be Made Opening space to commercial mining does not mean that science takes a back seat. Space-mining interests could drive scientific advancement by discovering extremely rare or unknown minerals on other planetary bodies.

Robotics Would Do the Work While countless lives have been lost on Earth over the centuries due to mining accidents and disasters, it is likely that humans will not have to risk their lives by traveling in-person to off-world mining sites. Regolith-sampling probes are already in use and provide an early glimpse of what a scaled-up robotic mining craft may one day look like.

Off-Earth Mining and Space Law The [1967 Outer Space Treaty](https://www.thomasnet.com/insights/is-the-outer-space-treaty-outdated/) is unclear in terms of whether any country — or private company — can claim mineral rights in space. It states that “exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind.” The[1979 Moon Treaty](https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/moon-agreement.html) was an attempt to declare the Moon and its natural resources to be CHM (Common Heritage of Mankind). Significantly, it called for “an equitable sharing [by all countries] in the benefits derived from these resources.” Most nations, including the U.S., did not ratify this treaty.Recently, the U.S. has accelerated its efforts to create a legal framework for the exploitation of resources in space.The Obama administration signed the [U.S. Commercial Space Launch Competitiveness Act of 2015](https://www.faa.gov/about/office_org/headquarters_offices/ast/media/US-Commercial-Space-Launch-Competitiveness-Act-2015.pdf), allowing U.S. citizens to “engage in the commercial exploration and exploitation of space resources.”In April 2020, the Trump administration issued an [executive order](https://www.space.com/trump-moon-mining-space-resources-executive-order.html) supporting U.S. mining on the Moon and asteroids.In May 2020, NASA unveiled the [Artemis Accords](https://www.washingtonpost.com/technology/2020/05/15/moon-rules-nasa-artemis/), which included the development of safety zones around lunar mining sites. Former NASA administrator Jim Bridenstine said: “It’s time to establish the regulatory certainty to extract and trade space resources,” and clarified in a separate statement that: “We do believe we can extract and utilize the resources of the moon, just as we can extract and utilize tuna from the ocean.” NASA planned an [Asteroid Redirect Mission](https://www.nasa.gov/content/what-is-nasa-s-asteroid-redirect-mission) which involved collecting a multi-ton boulder from an asteroid and redirecting it into a stable orbit around the moon, but the mission was canceled in 2017. What Companies Are Preparing for a Future of Space Mining?One thing that is becoming clear is that off-earth mining is unlikely to be a state-run activity. Instead, several private companies are jockeying to be first in line to access minerals in space. [iSpace](https://ispace-inc.com/) (Japan) has a mission to “help companies access new business opportunities on the moon,” including the extraction of water and mineral resources to spearhead a space-based economy. Planetary Resources (defunct) was founded in 2009 with the goal of developing a robotic asteroid mining industry. Despite having high-profile founding investors including Alphabet’s Larry Page, Eric Schmidt, and Virgin Group founder Richard Branson, Planetary ran into financial trouble in 2018 and was gone by 2020. Deep Space Industries (defunct) was another early mover that intended to explore, examine, sample, and harvest minerals from asteroids. DSI was acquired by Bradford Space in 2019.[Offworld](https://www.offworld.ai/) is an AI company building “universal industrial robots to do the heavy lifting [including mining] on Earth, the Moon, asteroids, and Mars.” [The Asteroid Mining Corporation](https://asteroidminingcorporation.co.uk/) (UK) is a venture currently crowdfunding for a 2023 satellite mission called “El Dorado,” which will conduct a spectral survey of 5,000 asteroids to identify the most valuable for mining.  Alongside the U.S., the tiny European nation of Luxembourg has also developed a space mining framework and has subsequently [emerged as a European hub](https://www.businesswire.com/news/home/20201118005699/en/) for the fledgling industry.

#### The private sector is essential for finding resources in space– competition is key and government development is not effective, efficient, or cheap enough. Thiessen 21:

Marc Thiessen, 6-1, 21, Washington Post, Opinion: SpaceX’s success is one small step for man, one giant leap for capitalism, https://www.washingtonpost.com/opinions/2020/06/01/spacexs-success-is-one-small-step-man-one-giant-leap-capitalism/

It was one small step for man, one giant leap for capitalism. Only three countries have ever launched human beings into orbit. This past weekend, SpaceX became the first private company ever to do so, when it sent its Crew Dragon capsule into space aboard its Falcon 9 rocket and docked with the International Space Station. This was accomplished by a company Elon Musk started in 2002 in a California strip mall warehouse with just a dozen employees and a mariachi band. At a time when our nation is debating the merits of socialism, SpaceX has given us an **incredible testament to the power of American free enterprise.** While the left is advocating unprecedented government intervention in almost every sector of the U.S. economy, from health care to energy, **today Americans are celebrating the successful privatization of space travel.** If you want to see the difference between what government and private enterprise can do, consider: It took a private company to give us the first space vehicle with touch-screen controls instead of antiquated knobs and buttons. It took a private company to give us a capsule that can fly entirely autonomously from launch to landing — including docking — without any participation by its human crew. It also took a private company to invent a reusable rocket that can not only take off but land as well. When the Apollo 11 crew reached the moon on July 20, 1969, Neil Armstrong declared “the Eagle has landed.” On Saturday, SpaceX was able to declare that the Falcon had landed when its rocket settled down on a barge in the Atlantic Ocean — ready to be used again. That last development will save the taxpayers incredible amounts of money. The cost to NASA for launching a man into space on the space shuttle orbiter was **$170 million per seat, compared with just $60 million** to $67 million on the Dragon capsule. The cost for the space shuttle to send a kilogram of cargo into to space was $54,500; with the Falcon rocket, the cost is just $2,720 — **a decrease of 95 percent.** And while the space shuttle cost $27.4 billion to develop, the Crew Dragon was designed and built for just $1.7 **billion — making it the lowest-cost spacecraft developed in six decades.** SpaceX did it in six years — far faster than the time it took to develop the space shuttle. ***The private sector does it better, cheaper, faster and more efficiently than government***. **Why? Competition.** Today, SpaceX has to compete with a constellation of private companies — including legacy aerospace firms such as Orbital ATK and United Launch Alliance and innovative start-ups such as Blue Origin (which is designing a Mars lander and whose owner, Jeff Bezos, also owns The Post) and Virgin Orbit (which is developing rockets than can launch satellites into space from the underside of a 747, avoiding the kinds of weather that delayed the Dragon launch). In the race to put the first privately launched man into orbit, upstart SpaceX had to beat aerospace behemoth Boeing and its Starliner capsule to the punch. It did so — for more than $1 billion less than its competitor. **That spirit of competition and innovation will revolutionize space travel in the years ahead.** Indeed, Musk has his sights set far beyond Earth orbit. Already, SpaceX is working on a much larger version of the Falcon 9 reusable rocket called Super Heavy that will carry a deep-space capsule named Starship capable of carrying up to 100 people to the moon and eventually to Mars. Musk’s goal — the reason he founded SpaceX — is to colonize Mars and make humanity a multiplanetary species. He has set a goal of founding a million-person city on Mars by 2050 complete with iron foundries and pizza joints. Can it be done? Who knows. But this much is certain: **Private-sector innovation is opening the door to a new era of space exploration**. Wouldn’t it be ironic if, just as capitalism is allowing us to explore the farthest reaches of our solar system, Americans decided to embrace socialism back here on Earth?

#### Resource wars cause extinction.

Collins 10 [Patrick Collins, professor of economics at Azabu University in Japan, and a Collaborating Researcher with the Institute for Space & Astronautical Science, as well as adviser to a number of companies, Adriano V. Autino is President of the Space Renaissance International; Manager, CEO/CTO, Systems Engineering Consultant / Trainer at Andromeda Systems Engineering LLC; and Supplier of methodological tools and consultancy at Intermarine S.p.A, Acta Astronautica, Volume 66, Issues 11–12, June–July 2010, “What the growth of a space tourism industry could contribute to employment, economic growth, environmental protection, education, culture and world peace”, Pages 1553–1562]

The major source of **social friction, including** international friction**,** has **surely** always been unequal access to resources.People fight to control **the** valuable resources on and under the land, **and in and under the sea. The** natural resources of Earth are limited in quantity, and economically accessible resources even more so. As the population grows, and demand grows for a higher **material standard of living, industrial activity grows exponentially.** The threat of resources becoming scarce has led to **the concept of** “Resource Wars”.Having begun long ago with wars to control the gold and diamonds of Africa and South America, and oil in the Middle East, the current phase is at centre stage of world events today [37]. A particular danger of “resource wars” is that, if the general public can be persuaded to support them, they may become impossible to stop as resources become increasingly scarce. **Many commentators have noted the similarity of the language of US and UK government advocates of “war on terror” to the language of the novel “1984” which describes a dystopian future of endless, fraudulent war in which citizens are reduced to slaves.**

Expansion into near-Earth space is the only alternative to endless “resource wars”

**As an alternative to the “resource wars” already devastating many countries today,** opening access to the unlimited resources of near-Earth space couldclearly facilitate world peace and security. **The US National Security Space Office, at the start of its report on the potential of space-based solar power (SSP) published in early 2007, stated: “**Expanding human populations and declining natural resources are potential sources oflocal and strategic conflict in the 21st Century**, and** many see energy as the foremost threat to national security**” [38]. The report ended by encouraging urgent research on the feasibility of SSP: “Considering the timescales that are involved, and the exponential growth of population and resource pressures within that same strategic period, it is imperative that this work for “drilling up” vs. drilling down for energy security begins immediately” [38].**

Although **the** use of extra-terrestrial resources on a substantial scale may **still** be some decades away, it is important to recognise **that** simply acknowledging its feasibility using known tech**nology** is the surest way of ending the threat of resource wars.That is, if it is assumed that the resources available for human use are limited to those on Earth, then it can be argued that resource wars are inescapable [22] and [37]. If, by contrast, it is assumed that the resources of space are economically accessible, this not only eliminates the need for resource wars, it can also preserve the benefits of civilisation which are being eroded today by “resource war-mongers”, most notably the governments of the “Anglo-Saxon” countries and their “neo-con” advisers. It is also worth noting that the $1 trillion that these have already committed to wars in the Middle-East in the 21st century is orders of magnitude more than the public investment needed to aid companies sufficiently to start the commercial use of space resources.Industrial and financial groups which profit from monopolistic control of terrestrial supplies of various natural resources, like those which profit from wars, have an economic interest in protecting their profitable situation. However, these groups’ continuing profits are justified neither by capitalism nor by democracy**:** they could be preservedonly by maintaining the pretence that use of space resources is not feasible, and by preventing the development of low-cost space travel. Once the feasibility of low-cost space travel is understood, “resource wars” are clearly foolish as well as tragic. A visiting extra-terrestrial would be pityingly amused at the foolish antics of homo sapiens using long-range rockets to fight each other over dwindling terrestrial resources—rather than using the same rockets to travel in space and have the use of all the resources they need! Investment in low-cost orbital access and other space infrastructure will facilitate the establishment of settlements on the Moon, Mars, asteroids and in man[/woman]-made space structures. In the first phase, development of new regulatory infrastructure in various Earth orbits, including property/usufruct rights, real estate, mortgage financing and insurance, traffic management, pilotage, policing and other services will enable the population living in Earth orbits to grow very large. Such activities aimed at making near-Earth space habitable are the logical extension of humans’ historical spread over the surface of the Earth. As trade spreads through near-Earth space, settlements are likely to follow, of which the inhabitants will add to the wealth of different cultures which humans have created in the many different environments in which they live.

Success of such extra-terrestrial settlements will have the additional benefit ofreducing the danger of human extinction due to planet-wide or cosmic accidents **[27]. These** horrors include **both man-made disasters such as** nuclear war**,** plagues **or growing** pollution**, and natural disasters such as super-**volcanoesorasteroid impact**.** It is hard to think of any objective **that is** more important than preserving peace.Weapons developed in recent decades are **so** destructive**, and have such horrific, long-term side-effects that their use should be discouraged as strongly as possible by the international community. Hence, reducing the incentive to use these weapons by rapidly developing the ability to use space-based resources on a large scale is surely equally important [11] and [16].** The achievement of thisdepends on low space travel costs **which, at the present time, appear to be achievable only through the development of a vigorous space tourism industry.**

## Off

#### Interpretation: the 1ac must disclose their 1ac speech docs open source with highlighting on their NDCA 2021 – 2022 wiki page under the correct side, their own name with full citations, tags, and first three/last three words at least an hour after the position is broken – if they don’t read a util framework or role of the ballot

#### Violation – you didn’t – I have screenshots

Graphical user interface, application

Description automatically generated

#### A. Debate resource inequities—you’ll say people will steal cards, but that’s good—it’s the only way to truly level the playing field for students such as novices in under-privileged programs.

Antonucci ‘05 [Michael (Debate coach for Georgetown; former coach for Lexington High School); “[eDebate] open source? resp to Morris”; December 8; http://www.ndtceda.com/pipermail/edebate/2005-December/064806.html //nick]

a. Open source systems are preferable to the various punishment proposals in circulation. It's better to share the wealth than limit production or participation. Various flavors of argument communism appeal to different people, but banning interesting or useful research(ers) seems like the most destructive solution possible. Indeed, open systems may be the only structural, rule-based answer to resource inequities. Every other proposal I've seen obviously fails at the level of enforcement. Revenue sharing (illegal), salary caps (unenforceable and possibly illegal) and personnel restrictions (circumvented faster than you can say 'information is fungible') don't work. This would - for better or worse. b. With the help of a middling competent archivist, an open source system would reduce entry barriers. This is especially true on the novice or JV level. Young teams could plausibly subsist entirely on a diet of scavenged arguments. A novice team might not wish to do so, but the option can't hurt. c. An open source system would fundamentally change the evidence economy without targetting anyone or putting anyone out of a job. It seems much smarter (and less bilious) to change the value of a professional card-cutter's work than send the KGB after specific counter-revolutionary teams.

#### B. Evidence ethics – open source is the only way to verify before round that cards aren’t miscut – otherwise you could have highlighted unethically. That’s a voter – maintaining ethical ev practices is key to being good academics and we should be able to verify you didn’t cheat

#### C. Depth of clash – open source allows debaters to come up with more nuanced researched objections to their opponents evidence before the round at a much faster rate, which leads to the highest quality evidence comparison instead of guessing what was highlighted

#### Reciprocity – util is the most predictbale fw - they have unlimited time to prep but the neg is reactive- disclosure allows debaters to bridge that gap- no way for the udge to vote for the better debater if theres unfair advantages

## Off

#### The Us is currently leading in space due to its superior private sector

Matthew Daniels (Dr. Matthew Daniels is a senior fellow and research faculty member at Georgetown University. He is also a senior expert for the Office of the Secretary of Defense, an advisor to MIT Lincoln Laboratory, and an affiliate at Stanford’s Center for International Security and Cooperation. He has served in engineering, leadership, and strategy roles at NASA and the Department of Defense. Dr. Daniels started as a research engineer at NASA, where he also served as part of NASA Ames delegations to build new technology projects with US partners in Europe, the Middle East, and South America. He received his PhD and MS degrees in engineering from Stanford University and a BA in physics from Cornell University, and he is a recipient of the Department of Defense Medal for Distinguished Public Service.

) The Johns Hopkins University Applied Physics Laboratory 2020 ["THE HISTORY AND FUTURE OF US–CHINA COMPETITION AND COOPERATION IN SPACE

", https://apps.dtic.mil/sti/pdfs/AD1116894.pdf] SN Accessed 12-28-2021.

**The U**nited **S**tates **retains a lead over China in** several areas of **space tech**nology, and **prospects for the future** range from the positive to the **(are)uncertain:** • Reusable launch systems created by **US companies such as SpaceX and Blue Origin are a generation ahead of** those of **Chinese competitors**—a sustainable lead of probably five to six years for the next decade.23 Reusability, however, primarily serves to reduce the cost of launch vehicles, and Chinese firms may be able to offer cheap launch vehicles without reusability. • US current and historic capabilities in reliable heavy launch (systems like the Atlas V and Delta IV Heavy, and more recently the Falcon Heavy) suggest a technological lead over China, which has recently returned its first heavy launch system (the Long March-5) to operation after an eighteen-month hiatus following a launch failure. Future US heavy launch systems from SpaceX (Falcon Heavy and Starship), Blue Origin (New Glenn), and United Launch Alliance (Vulcan) could sustain this US lead for a decade or more. • Based on publicly available data, US organizations appear to have more advanced capabilities in in-space propulsion and space robotics.24 • US satellite manufacturers and satellite remote sensing start-ups have a visible lead over Chinese ones in terms of sophistication of technical capability and the quantity of satellites in orbit,25 but this lead will probably be narrower and 23 This can be seen in the demonstrated successes of SpaceX and Blue Origin in landing boosters after flight, while there is no public data to suggest that China has successfully demonstrated this capability yet. 24 For example, see Henry, “Northrop Grumman’s MEV-1 Servicer.” 25 For example, companies like Planet deployed constellations in the early 2010s. more at risk in the years ahead. China is rapidly growing the capabilities needed to launch and operate small satellites. • US satellite component manufacturers probably have a lead in technical capabilities over their Chinese counterparts. • US firms probably have a narrow lead in data processing and analytics, but it is less clear whether the United States has advantages in software and data analysis, which are needed to make this lead sustainable. Software related to space activities will be highly competitive**.** As markets for the launch and use of small satellites grow significantly in the 2020s, **China’s** emerging commercial **space sector will** have particular opportunities tocontinue **grow**ing **rapidly.** China’s greatest advantages in “catching up” to US space technologies include a relatively mature knowledge of underlying principles for launch vehicles and satellites; the convergence of technologies that made small satellites commercially viable around the year 2000, which helped diffuse advanced satellite capabilities to countries like China; and the opportunity to— leveraging aerospace labor that costs less in China than in the United States—sell competitively priced launch and satellite services in the years ahead. As markets for the launch and use of small satellites grow significantly in the 2020s, China’s emerging commercial space sector will have particular opportunities to continue growing rapidly.26 **The United States’ greatest advantages** for continued leadership **in space** technologies **are** also **its** broader historic strengths: stable rule of law**, first-rate Commercial Space Sector,** the US economic engine and US companies, a network of international allies and partners, and effective partnerships between US government organizations and US companies. US Policies to Inhibit US–China Space Technology Exchange President Reagan created one of the early bridges between the US and Chinese space sectors by allowing US satellites to be launched on Chinese rockets—the first time a non-Western government was allowed to handle a US-made satellite.27 Two subsequent Chinese rockets carrying US commercial satellites failed during launch in 1995 and 1996; the American satellite manufacturers whose payloads were on the rockets, Hughes and Loral, participated in the Chinese launch failure review. The Congressional Cox Committee later determined that some technical information exchanged during this review involved launch vehicle technology instead of just satellite technology and so was outside the Commerce Department’s approval, constituting an export control violation. Both companies were heavily fined.28 The US Congress went further, using the 1999 National Defense Authorization Act (NDAA) to impose significant export controls on satellite technology. (Launch technology, given its relevance to the design of missiles, was already protected by additional US export controls.) The act moved satellite technology to the US Munitions List, making it subject to the International Traffic in Arms Regulations (ITAR) process under the jurisdiction of the State Department. 27 Pine, “China Told It Can Launch.” Congress also reduced US export controls on some US satellite technologies in 1992. This took the form of moving some communications satellite technologies from the State Department–managed US Munitions List to the Commerce Department–managed Commerce Control List in 1992. 28 For example, see Gerth, “2 Companies Pay Penalties.” Two important factors quickly became apparent. First, although motivation for the change in export controls focused on China, the new controls applied globally. The change made it much more difficult for US organizations, especially companies selling satellite systems and components, to engage potential partners and customers worldwide. Second, the designation of satellite technology in the ITAR process did not specify in sufficient detail what constituted “satellite technology,” and so enforcement expanded to nearly anything related to space. Absurd situations followed: in one widely quoted case, because the aluminum floor stand for a satellite awaiting launch in Russia, which was “indistinguishable from a common coffee table,” was deemed part of the satellite assembly and therefore a controlled item on the US Munitions List, the US company accompanied it with security officers.29 The control regime also imposed significant, personal penalties for violations, and violations could consist simply of discussing certain information about a commercial or scientific satellite with anyone who was not a US citizen. University researchers, therefore, were forced to limit collaborations with foreign colleagues on space projects to ensure that details of scientific spacecraft would not be shared.

#### Chinese Space Growth Decreases US Space Hegemony Allowing China to Control Information From Space Acting as a Weapon and Establish Monopoly Over the US

Greg **Autry** (Clinical Professor of Space Policy at Arizona State University’s Thunderbird School of Global Management. Served on the 2016 NASA transition team, The White House liaison at NASA, **and** the chair of the Safety Working Group for the U.S. Federal Aviation Administration’s Commercial Space Transportation Advisory Committee), Steve **Kwast** (Lieutenant General and commander of Recruiting, Training, Educating and Development for the Air Force. He is an astronautical engineer and Harvard Fellow in Public Policy), 12-8-**2018**, "America Is Losing the Second Space Race to China," Foreign Policy, <https://foreignpolicy.com/2019/08/22/america-is-losing-the-second-space-race-to-china/>]

U.S. military space planners are preparing to repeat a conflict they imagined back in the 1980s, which never actually occurred, against a vanished Soviet empire. Meanwhile, **China** is executing a winning strategy in the world of today. It is burning hard toward **domination of the** future **space markets** that will define the next century. They are planning infrastructure in space that **will control** 21st-century **telecommunications, energy, transportation, and manufacturing**. In doing so, they will acquire trillion-dollar revenues as well as the deep capabilities that come from continuous operational experience in space. **This will deliver space dominance and global hegemony to China**’s authoritarian rulers. Despite the fact that many in the policy and intelligence communities understand exactly what China is doing and have been trying to alert leadership, Air Force leadership has convinced the White House to fund only a slightly better satellite command with the same leadership, while sticking a new label onto their outmoded thinking. A U.S. Space Force or Corps with a satellite command will never fulfill Trump’s call to dominate space. Air Force leadership is demonstrating the same hubris that Gen. George Custer used in convincing Congress, over President Ulysses S. Grant’s better experience intuition, that he could overtake the Black Hills with repeating rifles and artillery. That strategy of technological overconfidence inflamed conflict rather than subduing it, and the 7th Cavalry were wiped out at the Battle of the Little Bighorn. The West was actually won by the settlers, ranchers, miners, and railroad barons who were able to convert the wealth of the territory itself into the means of holding it. They laid the groundwork that made the 20th century the American Century and delivered freedom to millions of people in Europe and Asia. Of course, they also trampled the indigenous people of the American West in their wake—but empty space comes with no such bloody cost. **The** very emptiness and wealth of this new, if not quite final, frontier, however, means that **competition** for resources and strategic locations in cislunar space (between the Earth and moon) **will be intense** over the next two decades. The outcome of this competition will determine the fate of humanity in the next century. **China’s** impending **dominance will neutralize U.S. geopolitical power by allowing Beijing to control global information flows** **from** the high ground of **space**. Imagine a school in Bolivia or a farmer in Kenya choosing between paying for a U.S. satellite internet or image provider or receiving those services for free as a “gift of the Chinese people.” It will be of little concern to global consumers that the news they receive is slanted or that searches for “free speech” link to articles about corruption in Western democracies. Nor will they care if concentration camps in Tibet and the Uighur areas of western China are obscured, or if U.S. military action is presented as tyranny and Chinese expansion is described as peacekeeping or liberation. **China’s** aggressive **investment** in space solar power **will** allow it to **provide cheap, clean power to the world, displacing U.S. energy firms** while placing a second yoke around the developing world. Significantly, **such** orbital **power stations** have dual use potential and, if properly designed, **could serve as powerful offensive weapons** platforms. China’s first step in this process is to conquer the growing small space launch market. **Beijing is providing** nominally commercial firms with **government**-**manufactured**, mobile intercontinental ballistic **missiles** they can use to dump launch services on the market **below cost**. These start-ups are already undercutting U.S. pricing by 80 percent. Based on its previous success in using dumping to take out U.S. developed industries such as solar power modules and drones, China will quickly move upstream **to attack the leading U.S.** launch **providers and secure a global** commercial **monopoly**. Owning the launch market will give them an insurmountable advantage against U.S. competitors in satellite internet, imaging, and power. **The United States can still** build a strategy to **win**. At this moment, **it holds the** competitive **advantage** in every critical space technology **and has** **the** **finest** set of **commercial space firms** in the world. It has pockets of innovative military thinkers within groups like the Defense Innovation Unit, under Mike Griffin, the Pentagon’s top research and development official. **If the United States** simply **protects the intellectual property** its creative minds unleash **and defend its** truly free **markets from** strategic **mercantilist attack, it will not lose this** new **space race.** The United States has done this before. It beat Germany to the nuclear bomb, it beat the Soviet Union to the nuclear triad, and it won the first space race. None of those victories was achieved by embracing the existing bureaucracy. Each of them depended on the president of the day following the only proven path to victory in a technological domain: establish a small team with a positively disruptive mindset and empower that team to investigate a wide range of new concepts, work with emerging technologies, and test innovative strategies. Today **that means** giving a dedicated Space Force the freedom to easily **partner with commercial firms and leverage the private capital** in building sustainable infrastructure **that** actually **reduces the likelihood of conflict** while securing a better economic future for the nation and the world.

#### Decline of US hedge causes unstable nuclear alliances that cause war – states cling to hegemony but the lack of clear rules causes extinction

**Hayes 18** [Peter Hayes, Nautilus Institute, Berkeley, California, USA; Center for International Security Studies, Sydney University. Trump and the Interregnum of American Nuclear Hegemony. November 8, 2018. <https://www.tandfonline.com/doi/full/10.1080/25751654.2018.1532525>]

**During a post-hegemonic era, long-standing nuclear alliances are** likely **to be replaced by** ad hoc **nuclear coalitions**, aligning and realigning around **different congeries of threat and even** **actual nuclear wars, with much higher levels of uncertainty and unpredictability than** was the case in the **nuclear** hegemonic system.

There are a number of ways that this dynamic could play out during the interregnum, and these dynamics are likely to be inconsistent and contradictory. In some instances, the sheer momentum of past policy combined with bureaucratic inertia and the potency of political, military service and corporate interests, may ensure that residual aspects of the formerly hegemonic postures are adhered to even as formal nuclear alliances rupture. Even as they reach for the old anchors, these states may be forced to adjust and retrench strategically, or start to take their own nuclear risks by making increasingly explicit nuclear threats and deployments **against nuclear-armed adversaries** – as Japan has begun to do with reference to its “technological deterrent” since about 2012.[9](https://www.tandfonline.com/doi/full/10.1080/25751654.2018.1532525) This period could last for many years until **and when** nuclear war breaks out **and leads to a post-nuclear war disorder;** or a new, post-hegemonic strategic framework is established to manage and/or abolish nuclear threat.

Under full-blown American **nuclear** hegemony, fewer states had nuclear weapons, the major nuclear weapons states entered into legally binding restraints on force levels and they learned from nuclear near-misses to promulgate rules of the road and tacit understandings. The lines drawn during full-blown collisions involving nuclear weapons were stark and concentrated the minds of leaders greatly. In a nuclear duel, it was clear that only one of two sides could fire first; the only question was which one. Now, with nine nuclear weapons states, and conflicts conceivably involving three, four or more of them, no matter how much leaders concentrate, it will not be evident who is aiming at who, who may fire first, and during a volley, who fired first and even who hit whom.

In a highly proliferated world, nuclear-armed states may feel driven to obtain larger nuclear forces able to deter multiple adversaries at the same time, sufficient to conduct not only a few nuclear attacks but configured to fight more than one protracted nuclear war at a time, especially in nuclear states torn apart by civil war and post-nuclear attack reconstruction. The first time nuclear weapons are used since 1945 will be shocking, the second time, less so, the third time, the new normal.

## Off

#### Counterplan: governments should implement a public trust doctrine to ensure appropriation is for general welfare, making private space competition sustainable and equitable

#### Prefer

Hope M. **Babcock**, (Professor of Law, Georgetown University Law Center), Syracuse Law Center, 06-20-20**19** ["THE PUBLIC TRUST DOCTRINE, OUTERND THE GLOBAL COMMONS: TIME TO CALL HOME ET", https://lawreview.syr.edu/wp-content/uploads/2019/09/H-Babcock-Article-Final-Document-v2.pdf] MK Accessed 1-2-2022.

**The PTD offers** both **an approach for managing an open access commons and a gap-filling tool until a regulatory regime is adopted**.507 **The doctrine** is based on the idea that the “sovereign **holds** certain common properties in trust in perpetuity for the free and **unimpeded** **use of the general public**.”508 The public’s right to access and use **trust resources** is never lost, and neither the government nor private individuals can alienate or otherwise adversely affect those resources unless for a comparable public purpose.509 The resources the doctrine protects “have long been part of a ‘taxonomy of property’ [that recognizes] the division of natural wealth into private and public property.”510 “The doctrine places on governments ‘an affirmative, ongoing duty to safeguard the long-term preservation of those resources for the benefit of the general public,’”511 thus limiting the sovereign’s power on behalf of both present and future individuals.512 It directs the government to manage trust resources for public benefit, not private gain.513 It applies to private as well as public resources and is used to preserve the public’s access to CPRs.514 Government agencies have the non-rescindable power to revoke uses of trust resources that are inconsistent with the doctrine.515 This effectively places a permanent easement over trust resources that burdens their ownership with an overriding public interest in the preservation of those resources.516 However, **trust resources can be alienated in favor of private ownership, if the alienation will still serve the public’s interest in those resources and not interfere with trust uses of the remaining land.**517 **The PTD, therefore, protects the “people’s common heritage**,”518 just as Article 11 of the Moon Treaty protects outer space as part of the common heritage of mankind.5The doctrine also appears to be infinitely malleable. Original uses of the doctrine were restricted to only that “aspect of the public domain below the low-water mark on the margin of the sea and the great lakes, the waters over those lands, and the waters within rivers and streams of any consequence,”520 and covered only traditional uses of those lands, like fishing and navigation.521 Over time, the scope and application of the doctrine broadened to protect more public resources and different uses.522 Thus, **the doctrine** expanded to **protect new trust resources**, such as dry sand beaches, inland lakes, groundwater, dry riverbeds, and wildlife,523 and **passive uses of those resources, like scientific study.**524 The original link to navigable water and tidelands disappeared.525 Supporters of the doctrine successfully advocated that it be applied to “wildlife, parks, cemeteries, and even works of fine art,”526 while arguing more recently its application to the atmosphere.527 A doctrine that imposes a perpetual duty on the sovereign to preserve trust resources, prevents their alienation for private benefit, assures public access to them, and can be invoked by anyone seems particularly useful as a management tool in outer space.528 The fact that public access to trust resources is so central to the doctrine makes it reflective, not contradictory, of international space law’s bar against appropriation of outer space and of the principle of space being the “province of all mankind.”529 It avoids the problems of alienation and exclusion associated with any of the management approaches associated with some form of private property and requires neither the creation of a new administrative authority nor the presence of a close-knit group of like-minded people.530 **Members of the public, both rich and poor, can invoke and enforce the doctrine as easily** as the sovereign.531 It is cost effective to the extent that no separate apparatus is required to implement it, and the doctrine has shown itself to be highly adaptable and innovative as different needs arise.532 It could also fill the gap in international law with respect to managing celestial property. Therefore, of all the management approaches studied here, **the PTD seems the most suited to keep order in space** until a regulatory regime is imposed. However, the doctrine provides no incentives for development of trust resources; rather, it might be used to limit or curtail that development, making it an imperfect, perhaps even counter-productive solution by itself to the extent that such development might be beneficial.533 Modifying the doctrine to allow limited use of private property management approaches, like tradable development claims, might buffer that effect—a form of overlapping hybridity between one type of property, a commons, and a management regime from another, private property, enabled by application of the PTD.

The future is now with regard to the development of outer space and its resources—**it is no longer a question of whether humans will engage in these activities, but how soon they will.** **Technically advanced countries** and private commercial enterprises **are probing** outer space and preparing for landing on an asteroid or the moon to extract their **resources**. Speculators are selling deeds to the moon’s surface **and preparing to exploit the tourism potential** that space offers. But, **the legal framework for managing these initiatives is** almost **nonexistent**. International treaties came into being before all this activity began in earnest and national laws that might apply are stunted by jurisdictional quandaries like the absence of national boundaries in outer space.538 Thus, **there is an urgency to figure** out how to control what happens in **outer space before** its **resources** are irreparably damaged or permanently **monopolized** **by powerful countries** **and individuals**. In the absence of regulation, much of the current debate centers on what property regime should be applied in outer space.539 The assumption is that by only allowing private property rights in space, countries and commercial enterprises will undertake the risks and costs of space development.540 However, unless international space law changes, it may prevent this from happening. If it changes**, strong management controls will be necessary to prevent destruction or over-consumption** of celestial resources, as well as **monopolization** and competitive behavior by participants, which could lead to hostilities **and inequities.** This Article examines various private property regimes, including those of less than full fee ownership, to see if any would avoid the conflict with the international prohibition on appropriation of outer space and its resources. It concludes that none will because each retains the right to exclude and each is insensitive to the treaties’ equity concerns. In contrast, considering outer space to be common is consistent with international space law in both respects. Hypothesizing that private property in outer space may yet prevail, this Article investigates different private property management approaches, such as the right of first possession, lotteries, and tradable development rights, to see if any would be cost effective, easy to implement and equitable, and would also prevent over-consumption, monopolization or the slide into rivalrous behavior. The Article concludes that each comes up short in some respect. Social norms as a management tool for property held in common, although compliant with international law, are also not up to the task. **Instead, although ancient, the PTD, with its malleability, easy and cost-effective implementation and enforcement, non-consumption principle, and consistency with the goals that animate international space treaties, seems best suited to the task of protecting the public’s interests** in the global commons that is outer space as it has done for centuries in Earth-bound commons. But, as its principal terrestrial use has been to protect trust resources from development, the doctrine needs some modification to encourage development of celestial resources. Hence, this Article suggests that modifying the PTD to allow the application of private property management tools, like tradable development rights, will not only allow development, but also will assure that when it happens, it will not be just profitable for a few, but will also **be sustainable and equitable.**

## Rebuttals

#### Debris collision is so unlikely, we don’t even need to remove debris

**Mosher** **’19** [Dave; September 3rd; Journalist with more than a decade of experience reporting and writing stories about space, science, and technology; Business Insider, “Satellite collisions may trigger a space-junk disaster that could end human access to orbit. Here’s How,” <https://www.usafa.edu/app/uploads/Space_and_Defense_2_3.pdf>; GR]

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 networkof 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).

#### 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.

#### No escalation from satellite destruction

Bleddyn Bowen 18, University of Leicester International Relations Lecturer, "The Art of Space Deterrence," European Leadership Network, 2-20-18, https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/

As consensus emerges on the possibility that, should a major war occur, satellites will mostly likely be attacked or harassed in one way or another, there is increasing deliberation on ‘space deterrence’, or how to prevent would-be aggressors from attacking satellites and other parts of space infrastructure on Earth. Reasoned analysis focuses on applying imagined thresholds of sensitivity and reaction based on the types of satellites attacked, how they are attacked, and when they are attacked in a crisis. For example, a Planet Labs imaging satellite being jammed outside of a crisis is a different incident compared to a Keyhole imagery satellite being destroyed during a Taiwan crisis.

Indeed, it is crucial to think about what systems any space power may value above all others, which they may be able to suffer losing, and which losses may provoke a stern reaction. Most tools of space warfare today, of which America, China, and Russia lead, include jamming and Earth-based kinetic-kill capabilities that are ground, sea, or air missile based. Additionally, many Earth-based weapons such as missiles, attack aircraft, and naval vessels can bombard ground facilities if they are in range. However, as those narrow discussion tend to delve into the technical and tactical weeds, there are useful principles to remember when considering space deterrence on a more strategic level.

With the tools of space warfare spreading, then, how does one deter an adversary from attacking one’s valuable and essential space infrastructure that is responsible for precision warfare as well as precision farming? This is a very difficult question to answer, and there are no direct and holistic ones to be given. But general ground rules for strategic thought can be provided. The difficulty is that any reason to think that space deterrence may be easier to achieve than equivalents on Earth has a counter that may highlight why, in some circumstances, space deterrence may be harder to impose in the mind of the adversary.

First, politics, strategy, and deterrence relationships in space are extensions of those on Earth. Space deterrence remains an art of understanding the opponent’s psychology, valued possessions, and political objectives, as space deterrence is just a thematic or geographic variant of deterrence in general. Although space specialists are needed to understand spacepower, war in space is still subject to the same strategic logic as other terrestrial environments, and therefore deterrence in space cannot ignore events on Earth. Space warfare is merely the continuation of Terran politics by other means; a shooting war is space does not occur in a political vacuum. Additionally, some countries may have an ability to attack or disrupt satellites but possess no space-based assets of their own. Therefore, a tit-for-tat exchange of responding to a satellite attack with a satellite attack will not always be an option. Terrestrial threats and retaliation may be called for to deter attacks on space assets and space deterrence requires a joint approach, just as a joint approach to modern deterrence on Earth requires spacepower to function.

Adhering too narrowly to the concept of ‘space deterrence’ can mislead analysis to isolate space from Earth. It is as misleading as speaking in terms of ‘air deterrence’ or ‘sea deterrence’. Deterring a state from taking a particular action in any environment requires more than one method of deterring by denial or punishment. Rather, modern deterrence relationships need to account for the role space systems play in building holistic deterrent and warfare capabilities in every environment, as well as the role satellites and space infrastructure may play in triggering, exacerbating, or resolving crises on Earth, as well as winning wars.

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.

**Not existential – keystone species substitution.**

**Peter Kareiva and Valerie Carranza, Director of the Institute of the Environment and Sustainability at UCLA & Pritzker Distinguished Professor in Environment & Sustainability, in Futures, in 2018** ["Existential risk due to ecosystem collapse: Nature strikes back", https://www.sciencedirect.com/science/article/pii/S0016328717301726, 7-30-2019] AR

The interesting question is whether any of the planetary thresholds other than CO2 could also portend existential risks. Here the answer is not clear. One boundary often mentioned as a concern for the fate of global civilization is biodiversity (Ehrlich & Ehrlich, 2012), with the proposed safety threshold being a loss of greater than .001% per year (Rockström et al., 2009). **There is little evidence** that this particular .001% annual loss is a threshold—and it is hard to imagine any data that would allow one to identify where the threshold was (Brook et al., 2013; Lenton & Williams, 2013). A better question is whether one can imagine any scenario by which the loss of too many species leads to the collapse of societies and environmental disasters, even though **one cannot know the absolute number of extinctions that would be required** to create this dystopia. While there are data that relate local reductions in species richness to altered ecosystem function, these results do not point to substantial existential risks. The data are small-scale experiments in which plant productivity, or nutrient retention is reduced as species number declines locally (Vellend, 2017), or are local observations of increased variability in fisheries yield when stock diversity is lost (Schindler et al., 2010). **Those are not existential risks**. To make the link even more tenuous, there is little evidence that biodiversity is even declining at local scales (Vellend et al 2017; Vellend et al., 2013). Total planetary biodiversity may be in decline, but **local and regional biodiversity is** often **staying the same** because **species from elsewhere replace local losses**, albeit homogenizing the world in the process. Although the majority of conservation scientists are likely to flinch at this conclusion, **there is growing skepticism** regarding the strength of evidence linking trends in biodiversity loss to an existential risk for humans (Maier, 2012; Vellend, 2014). Obviously if all biodiversity disappeared civilization would end—but no one is forecasting the loss of all species. It seems plausible that the loss of 90% of the world’s species could also be apocalyptic, but not one is predicting that degree of biodiversity loss either. Tragic, but plausible is the possibility our planet suffering a loss of as many as half of its species. If global biodiversity were halved, but at the same time locally the number of species stayed relatively stable, what would be the mechanism for an end-of-civilization or even end of human prosperity scenario? Extinctions and biodiversity loss are ethical and spiritual losses, but perhaps **not an existential risk.**

#### 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>

1. 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.