# 1NC

## 1 - T

**Interpretation: Affirmative debaters may only garner offense from actions directly supported by the text of the resolution.**

**Violation: They defend a plan, which is not supported by “Resolved: The appropriation of outer space by private entities is unjust.” Their expansion of the public trust doctrine is a normative action that goes beyond the rcognition of private appropriation as unjust. The resolution only asks us to answer an ethical question, not to propose a policy solution. Therefore, they violate, because the plan-text is extra-topical.**

**Standards:**

#### Strat skew: their extra-topical advocacy allows them to fiat any world that involves a restriction on private space appropriation – impossible for the negative to engage because they can fiat infinitely good policies that have no disadvantage or kritik ground.

1. **Clash – we don’t do prep on things outside the resolution so the neg can’t read good arguments – I prepared philosophical and critical negatives based on whether the appropriation of outer space is unjust because of the topic’s wording, so I’m forced to go for generics or improvised arguments when they read a plan, which gives me a major disadvantage. Also, going for worse arguments reduces the quality of education.**

**Fairness is a voter because**

1. **The only way a judge can determine who’s better is if we enter the debate on an even playing field.**
2. **People quit if they lose to unfair arguments so fairness is a prereq to debate’s existence.**

**Education is voter because:**

1. **It’s the only portable benefit of debate.**
2. **It’s the only reason we get funding.**

**Theory is drop the debater:**

1. **Only DTD enables theory to deter bad behavior and be a tool for norm setting.**
2. **Dropping the arg means you drop the entire aff.**

**No RVI’s:**

1. **they’re illogical – it doesn’t make sense to reward someone for not doing anything bad.**
2. **RVI’s chill legitimate theory, justifying even more abuse.**

**Competing Interps: Reasonability lets them arbitrarily choose a brightline that favors their arguments – skews fairness.**

## 2 – DA

#### Private sector development is happening now and is necessary to scale up and lock in India’s status as a powerhouse in space.

EdexLive, 06-25-2020, "Opening space sector will enable India to play important role in global space economy: ISRO chief," New Indian Express, https://www.edexlive.com/news/2020/jun/25/opening-space-sector-will-enable-india-to-play-important-role-in-global-space-economy-isro-chief-12874.html TDI

SRO chief K Sivan on Thursday stated that opening the space sector for private enterprises will help scale up benefits from space technology and enable Indian industry to be an important player in the global space economy. "If the space sector is opened (for private enterprises), the potential of the entire country can be utilised to scale up benefits from space technology. It will not only result in the accelerated growth of the sector but also enable Indian industry to be an important player in the global space economy," the Indian Space Research Organisation chief said. Sivan said that far-reaching reforms in space technology in India will put the country in the league of the select countries. "As part of longer socio-economic reform, space reforms will improve access to space-based services for India's development. Far-reaching reforms will put India in the league of few countries with efficient promotional and authorisation mechanism for private-sector space activities," he said. Talking about reforms that the government is planning to implement in the country's space sector, he said, "Space sector, where India is among a handful of countries with advanced space technology, can play a significant role in boosting the industrial base of India." "The government's decision is to implement reform measures to leverage ISRO's achievement by opening the space sector for private enterprises," he added. He further said that "Department of Space will promote sector space activities to enable it to provide end to end space services, including building and launching of rockets and satellites as well as providing space-based services on a commercial basis." "With this, there is an opportunity for large scale employment in the technology sector and India becoming a global technology powerhouse," ISRO chief added. Sivan also talked about the government's decision to establish an autonomous nodal agency for taking independent decisions for regulating the activities of private companies. "Government has approved the establishment of an autonomous nodal agency - Indian National Space, Promotion and Authorisation Centre - for taking independent decisions with respect to permitting and regulating the activities of private companies in the space sector," said ISRO chief. "It will act as a national nodal agency for handholding and promoting the private sector in space endeavours and for this ISRO will share its technical expertise as well as facilities," he added.

#### India private sector is key to space success – low cost operations, transparency, and accountability.

Rajagopalan ’20 [Dr Rajeswari (Raji) Pillai Rajagopalan is the Director of the Centre for Security, Strategy and Technology (CSST) at the Observer Research Foundation, New Delhi., 5-24-2020, "India’s Space Programme: A role for the private sector, finally?," ORF, <https://www.orfonline.org/research/indias-space-programme-a-role-for-the-private-sector-finally-66661/>] TDI

India’s finance minister Nirmala Sitharaman announced last week that India’s private sector will play a key role in augmenting India’s space programme, and that the government intends to share the facilities of the Indian Space Research Organisation (ISRO) with the private sector. This announcement was part of the Narendra Modi government’s call for new and bold reforms in an effort to promote its ‘self-reliant India’ mission. It is the fourth segment of the Rs 20 lakh crore Aatma Nirbhar Bharat Abhiyan special economic stimulus. Sitharaman’s announcement entails a role for the private sector, possibly with the goal of greater investments in technology development and acquisition, capacity-building and space exploration, including planetary exploration. The minister, while announcing these reforms, appeared to understand that the private sector can help augment India’s space capability. While praising the work done by ISRO, she also pointed out that the private sector is also doing a lot of work in developing space technology. She also acknowledged that the existing regulations prevent private entities from using or even testing their products. Therefore, to level the playing field, the government “will make a provision for the private sector to benefit from the assets which are available to ISRO and for India (in general) to benefit from.” The minister also said the new reforms would allow the private sector to play an active role in “satellites, launches and space-based services”. But as always, implementation is key. Properly executing these reforms will require enabling policies and appropriate regulatory frameworks. That the new reforms will allow private sector players to use ISRO facilities is a big deal. This indeed must be music to the ears of commercial players who have been seeking to get a fair share of the pie in terms of manufacturing of satellites and propellant technologies, among other areas. It should not be too difficult for India’s private space sector because there is a sizeable talent pool available outside ISRO. More importantly, the entry of the private sector, as in the telecom sector, can bring several advantages in terms of cost and access. Following the announcement, ISRO tweeted that it will follow the government’s guidelines to allow the private sector to undertake space activities in the country. Though this did not seem particularly welcoming of the government’s initiative, ISRO’s support is critical to making it a success. ISRO has in the last few years been opening up to the Indian private space sector in a gradual manner – mostly as a matter of compulsion because ISRO simply does not have the in-house capacity to address India’s growing requirements. Today, the Indian space programme is not just about civilian applications for remote-sensing, meteorology and communication, as in the early decades. India’s space sector and its requirements have grown enormously in the last decade to include television and broadband services, space science and exploration, space-based navigation and, of course, defence and security applications. Among others, Ambassador Rakesh Sood has articulated the need for legislation to facilitate ISRO’s partnership with industries and entrepreneurs. Narayan Prasad and Prateep Basu, two prominent faces in the Indian space start-up segment, have argued that despite ISRO’s successes, “India’s space competitiveness has suffered from the absence of a globally reputed, private space industry**.”** The private sector, especially the NewSpace industry and start-ups, have an advantage in terms of low-cost operations, which itself should be a big incentive for the government to make it an active stakeholder. A certain amount of democratisation of space technology with the participation of the private sector can ensure costs are kept low. And expanding the number of stakeholders will also ensure more transparency and better accountability and regulatory practices. This has been missing in India’s space sector. The same agency has undertaken promotion, commercialisation and regulatory functions – which is not healthy.

#### India space key to soft power.

Hickert 17 Cameron Hickert, Harvard’s Belfer Center for Science and International Affairs, Schwarzman Scholars, "Space Rivals: Power and Strategy in the China-India Space Race - Schwarzman Scholars", August 14, 2017, <https://www.schwarzmanscholars.org/events-and-news/space-rivals-power-strategy-china-india-space-race/> TDI

The regional rivalry between India and China has long simmered, and the next frontier increasingly appears to be space. Beyond the hard power dimension, this regional space race has taken on many of the soft power characteristics of the competition between the U.S. and U.S.S.R. during the Cold War. It should not be forgotten, “a major factor in the Asian space race is prestige, as rapidly developing countries there use technology to jockey for status. Space technology in particular, being flashy and complex, often captures the most cache.” Because soft power is about perception and attraction, demonstrating prowess in space capabilities is a crucial step in building this power regionally. Many of the feats that China and India are pursuing have already been achieved by the U.S., so mistakes are costlier in terms of international credibility – failures are perceived as worse when another nation has already been successful. Yet the attraction power of spaceflight achievements is more lucrative than in the past, as private entities around the world face tighter competition and shorter timelines in launching satellites, and are therefore willing to bring their business to any nation that can demonstrate the ability to launch cargo safely and cheaply. A prime example is India’s recent launch of 20 satellites on a single rocket; this mission included satellites from around the world, including the United States. The increased soft power borne out of a successful space program therefore is not only useful in the struggle for regional prestige, but also paves the way for increased economic success in a fast-growing industry.

#### Continued Indian soft power key to South-Asian stability – it solves for goodwill among nuclear powers

Kugiel 12

Kugiel, Patryk. “India’s Soft Power in South Asia.” *International Studies*, vol. 49, no. 3–4, July 2012, http://dcac.du.ac.in/documents/E-Resource/2020/Metrial/420CihnnitaBaruah2.pdf

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Despite its theoretical and practical flaws, soft power occupies an important place in contemporary international relations and has been incorporated into the foreign policy strategies of many countries. **India has significant soft power resources** and is, in fact**, one of the few countries** capable of **providing alternative** political, economic and cultural **models to the West**. However, India has only recently rediscovered the importance of its international attractiveness and has started using soft power capabilities by developing new instruments and strengthening institutions responsible for its projection abroad. In the end**, India’s soft power** at the global level **depends on internal reforms** that will help solve persisting developmental, societal and political deficiencies. Needless to say, soft power has already an important role to play at the South Asian level. Although more comprehensive and detailed studies are required to understand and evaluate properly the effectiveness of India’s soft power in the region, this essay allows us to draw three general conclusions. First, there are signs that India has deliberately incorporated soft power elements into its regional strategy. This is based on past experience of the inefficacy of the hard power approach and the belief that reducing the trust deficit and generating acceptance for its leadership role in the region are important conditions for the realization of its regional and global objectives. If India can effectively mitigate fears among its smaller neighbours, it may find them more willing to engage in closer economic and political cooperation. This soft power approach entails, among other things, a modest and pragmatic foreign policy, prioritization of economic cooperation, more active International Studies, 49, 3&4 (2012): 351–376 India’s Soft Power in South Asia 373 public diplomacy and cultural and development cooperation. A shift in India’s policy in the region points to India’s new charm offensive in South Asia. Second, there are some indications that this **soft power** approach may bring about positive outcomes. Even without solving important persisting issues with its neighbours, the new strategy has **helped to move** these **relations in a positive direction**. Available public opinion polls show that India has already amassed a significant capital of **goodwill in a few South Asian countries** (Afghanistan, Nepal, Sri Lanka and Bangladesh), which gives it a significant **advantage in realizing its foreign policy objectives**. In particular, the example of Afghanistan, where India has got favourable views through its civilian engagement in the last one decade, points that this approach can indeed bear fruit. It is thus important that India continues to expand the soft power approach through more active cultural and public diplomacy. It should strengthen people-to-people contacts, **encourage more trade and investments**, increase foreign aid and share its democratic experience with neighbouring countries. Further, India should play a more proactive role in enhancing regional cooperation and integration through the SAARC process

#### South Asia War goes Nuclear and causes Extinction.

Menon 19 Prakash Menon, The nuclear cloud hanging over the human race, Nov 15, 2019, [PhD from Madras University for his thesis “Limited War and Nuclear Deterrence in the Indo-Pak context”] [https://www.telegraphindia.com/opinion/the-nuclear-cloud-hanging-over-the-human-race/cid/1719608#](https://www.telegraphindia.com/opinion/the-nuclear-cloud-hanging-over-the-human-race/cid/1719608) SM

The nuclear cloud hanging over the human race Even a limited India-Pakistan nuclear conflict could pose an existential challenge to life on Earth The smoke injected into the stratosphere due to a nuclear attack would block the sunlight and result in a ‘Nuclear Winter' - freezing temperatures that pose an existential threat. One study estimates that in an India-Pakistan exchange, the immediate casualties could number 125 million lives The smoke injected into the stratosphere due to a nuclear attack would block the sunlight and result in a ‘Nuclear Winter' - freezing temperatures that pose an existential threat. One study estimates that in an India-Pakistan exchange, the immediate casualties could number 125 million lives iStock Prakash Menon | | Published 15.11.19, 08:04 PM With the recent administrative changes in Jammu and Kashmir, Indo-Pak hyphenation has come back to haunt India’s aspirations to break out of that narrow mould and be perceived as an independent player on the global stage. The clubbing of India with Pakistan is an echo of India’s political and strategic confinement to the sub-continent. Pakistan has always attempted to paint the Indo-Pak situation as a nuclear flashpoint essentially to invite international intervention in what India insists is a bilateral issue. A recent report in the Bulletin of Atomic Scientists by Toon et al entitled 'How an India-Pakistan Nuclear War Could Start and have Global Consequences' provides grist to the mill of the nuclear flashpoint theory. But it also raises an issue that has yet not found its place in the public imagination nor has sufficient cognisance been taken by the political and military leadership of nuclear weapon powers – the climatic consequences of nuclear explosions. It is well known that nuclear powers have and continue to base their targeting requirements of nuclear weapons on calculations that are restricted mostly to the major but immediate effects of nuclear explosions – blast, heat and radiation. According to General Lee Butler, the former United States, Strategic Forces Commander, during the cold war, the Standard Integrated Operation Plan (SIOP) had targeted Moscow with 400 nuclear weapons and Kiev with 40. Several scientific studies of the impact of nuclear explosions since the 1980s up to the present which utilises advanced computer models, confirm the effect of smoke injected into the stratosphere that would block sunlight from reaching the earth’s surface and is described as ‘Nuclear Winter’. In essence global temperatures would plunge below freezing point thus posing threats to life support systems especially food production. In short, it threatened human existence itself. Later studies that focused on regional nuclear wars especially in the Indo-Pak context, have indicated that the impact of a nuclear exchange would have an immediate significant and catastrophic impact in terms of death and destruction. The latest Toon study, estimates that in a situation where around 350 warheads are used by India and Pakistan, the immediate casualties would vary between 50 to 125 million lives depending on the yields of the weapons used which could vary between 15-100 Kilotons. (a Kiloton being the explosive equivalent power of 1000 tons of TNT). Such scales and speeds of destruction for both parties would indeed be of an existential nature. Therefore, both India and Pakistan despite the rhetoric during times of tension have so far displayed caution and refrained from getting into situations where nuclear weapons are alerted. The speedy de-escalation after Balakot is indicative of a cautionary approach. Of course, this is no guarantee that the next round would not witness a different outcome. For as long as nuclear weapons exist in the arsenals of both countries, the possibility of use remains, however low the probability. It is now well known (but widely ignored by the strategic cognoscenti) that even a regional Indo-Pak nuclear war with hundreds of low yield nuclear explosions can also pose an existential threat at the global level. The latest study states “In the India-Pakistan scenario, we calculated a total of 16.1 TG (1 TG is equivalent of one million tons of smoke) of black carbon injected into the upper atmosphere (11 from India and 5.1 from Pakistan) for weapons with yields of 15 kilotons; 27.3 TG (19.8 from India and 7.5 from Pakistan) for 50 kiloton weapons; and 36.6 TG (27.5 from India and 9.1 from Pakistan) for 100 kiloton weapons. The smoke would be heated by sunlight and lofted high into the stratosphere, where it could remain for years, since it does not rain in the stratosphere”. The Climate Model indicates that global average temperatures and precipitation would be significantly lowered and comparisons are drawn to the ice age that prevailed thousands of years ago. Agriculture around the world would be impacted and billions of people could face starvation. In earlier studies, even 5 TG of smoke produced (which is one third of what is expected in a lower scale Indo-Pak conflict), food production would change in China and the US for specific crops causing widespread shortages at the global level. Moreover, the ozone layer would be degraded as the rising smoke absorbs the sunlight and heats up the stratosphere that would permit ultra-violet rays of greater magnitude to reach the earth causing negative effects. The political and strategic implications of the long-term impact on climate change challenges the foundations of the edifice on which nuclear weapon strategy has been constructed. It is obvious that any deliberate initiation of nuclear war has a high probability of posing an existential threat to humanity. Even with the achievement of the complete destruction of an adversary’s arsenal through a first strike, the initiator cannot itself escape the existential threat posed by long term climate change. This indicates that the First Use doctrine in the name of strengthening deterrence stands fully exposed for its incredibility and the utter stupidity of the use of nuclear weapons.

## 3 – DA

#### Private companies are set to mine in space – new tech and profit motives make space lucrative

Gilbert 21, (Alex Gilbert is a complex systems researcher and PhD student in Space Resources at the Colorado School of Mines, “Mining in Space is Coming”), 4-26-21, Milken Institute Review, https://www.milkenreview.org/articles/mining-in-space-is-coming // MNHS NL

Space exploration is back. after decades of disappointment, a combination of better technology, falling costs and a rush of competitive energy from the private sector has put space travel front and center. indeed, many analysts (even some with their feet on the ground) believe that commercial developments in the space industry may be on the cusp of starting the largest resource rush in history: mining on the Moon, Mars and asteroids. While this may sound fantastical, some baby steps toward the goal have already been taken. Last year, NASA awarded contracts to four companies to extract small amounts of lunar regolith by 2024, effectively beginning the [era of commercial space mining](https://payneinstitute.mines.edu/wp-content/uploads/sites/149/2020/09/Payne-Institute-Commentary-The-Era-of-Commercial-Space-Mining-Begins.pdf" \t "_blank). Whether this proves to be the dawn of a gigantic adjunct to mining on earth — and more immediately, a key to unlocking cost-effective space travel — will turn on the answers to a host of questions ranging from what resources can be efficiently. As every fan of science fiction knows, the resources of the solar system appear virtually unlimited compared to those on Earth. There are whole other planets, dozens of moons, thousands of massive asteroids and millions of small ones that doubtless contain humungous quantities of materials that are scarce and very valuable (back on Earth). Visionaries including Jeff Bezos [imagine heavy industry moving to space](https://www.fastcompany.com/90347364/jeff-bezos-wants-to-save-earth-by-moving-industry-to-space" \t "_blank) and Earth becoming a residential area. However, as entrepreneurs look to harness the riches beyond the atmosphere, access to space resources remains tangled in the realities of economics and governance. Start with the fact that space belongs to no country, complicating traditional methods of resource allocation, property rights and trade. With limited demand for materials in space itself and the need for huge amounts of energy to return materials to Earth, creating a viable industry will turn on major advances in technology, finance and business models. That said, there’s no grass growing under potential pioneers’ feet. Potential economic, scientific and even security benefits underlie an emerging geopolitical competition to pursue space mining. The United States is rapidly emerging as a front-runner, in part due to its ambitious Artemis Program to lead a multinational consortium back to the Moon. But it is also a leader in creating a legal infrastructure for mineral exploitation. The United States has adopted the world’s first spaceresources law, recognizing the property rights of private companies and individuals to materials gathered in space. However, the United States is hardly alone. Luxembourg and the United Arab Emirates (you read those right) are racing to codify space-resources laws of their own, hoping to attract investment to their entrepot nations with business-friendly legal frameworks. China reportedly views space-resource development as a national priority, part of a strategy to challenge U.S. economic and security primacy in space. Meanwhile, Russia, Japan, India and the European Space Agency all harbor space-mining ambitions of their own. Governing these emerging interests is an outdated treaty framework from the Cold War. Sooner rather than later, we’ll need [new agreements](https://issues.org/new-policies-needed-to-advance-space-mining/" \t "_blank) to facilitate private investment and ensure international cooperation.

Back up for a moment. For the record, space is already being heavily exploited, because space resources include non-material assets such as orbital locations and abundant sunlight that enable satellites to provide services to Earth. Indeed, satellite-based telecommunications and global positioning systems have become indispensable infrastructure underpinning the modern economy. Mining space for materials, of course, is another matter. In the past several decades, planetary science has confirmed what has long been suspected: celestial bodies are potential sources for dozens of natural materials that, in the right time and place, are incredibly valuabl**e**. Of these, water may be the most attractive in the near-term, because — with assistance from solar energy or nuclear fission — H2O can be split into hydrogen and oxygen to make rocket propellant, facilitating in-space refueling. So-called “rare earth” metals are also potential targets of asteroid miners intending to service Earth markets. Consisting of 17 elements, including lanthanum, neodymium, and yttrium, these critical materials (most of which are today mined in China at great environmental cost) are required for electronics. And they loom as bottlenecks in making the transition from fossil fuels to renewables backed up by battery storage. The Moon is a prime space mining target. Boosted by NASA’s mining solicitation, it is likely the first location for commercial mining. The Moon has several advantages. It is relatively close, requiring a journey of only several days by rocket and creating communication lags of only a couple seconds — a delay small enough to allow remote operation of robots from Earth. Its low gravity implies that relatively little energy expenditure will be needed to deliver mined resources to Earth orbit. The Moon may look parched — and by comparison to Earth, it is. But recent probes have confirmed substantial amounts of water ice lurking in [permanently shadowed craters](http://lroc.sese.asu.edu/posts/1105" \t "_blank) at the lunar poles. Further, it seems that solar winds have implanted significant deposits of helium-3 (a light stable isotope of helium) across the equatorial regions of the Moon. Helium-3 is a potential fuel source for second and third-generation fusion reactors that one hopes will be in service later in the century. The isotope is packed with energy (admittedly hard to unleash in a controlled manner) that might augment sunlight as a source of clean, safe energy on Earth or to power fast spaceships in this century. Between its water and helium-3 deposits, the Moon could be the resource stepping-stone for further solar system exploration. Asteroids are another near-term [mining target](https://foreignpolicy.com/2016/04/28/the-asteroid-miners-guide-to-the-galaxy-space-race-mining-asteroids-planetary-research-deep-space-industries/" \t "_blank). There are all sorts of space rocks hurtling through the solar system, with varying amounts of water, rare earth metals and other materials on board. The asteroid belt between the orbits of Mars and Jupiter contains most of them, many of which are greater than a kilometer in diameter. Although the potential water and mineral wealth of the asteroid belt is vast, the long distance from Earth and requisite travel times and energy consumption rule them out as targets in the near term. The prospects for space mining are being driven by technological advances across the space industry. The rise of reusable rocket components and the now-widespread use of off-the-shelf parts are lowering both launch and operations costs. Once limited to government contract missions and the delivery of telecom satellites to orbit, private firms are now emerging as leaders in developing “NewSpace” activities — a catch-all term for endeavors including orbital tourism, orbital manufacturing and mini-satellites providing specialized services. The space sector, with a market capitalization of $400 billion, could grow to as much as $1 trillion by 2040 as private investment soars.

#### OST defines appropriation as occupation, use, or any other means – the aff definitely links

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Based on the premise of ‘res communis’, the magna carta of space law, the OST, illustrates outer space as “the province of all mankind”.[l] Under Article I, States are free to explore and use outer space and to access all celestial bodies “on the basis of equality and in accordance with international law.”[li] Although the OST does not explicitly mention “mining” activities, under Article II, outer space including the Moon and other celestial bodies are “not subject to national appropriation by claim of sovereignty” through use, occupation or any other means.[lii] Furthermore, the Moon Agreement, 1979, not only defines outer space as “common heritage of mankind” but also proscribes commercial exploitation of planets and asteroids by States unless an international regime is established to govern such activities for “rational management,” “equitable sharing” and “expansion of opportunities” in the use of these resources.[liii]

#### Squo private companies are willing to invest, but the plan crosses a perception barrier which destroys investment

Shaw 13 - Lauren E, J.D. from Chapman University School of Law, ”Asteroids, the New Western Frontier: Applying Principles of the General Mining Law of 1872 to Incentive Asteroid Mining”, JOURNAL OF AIR LAW AND COMMERCE, Volume 78, Issue 1, Article 2, <https://scholar.smu.edu/cgi/viewcontent.cgi?article=1307&context=jalc> // recut MNHS NL

To some, the mining of asteroids might sound like the premise of a science fiction novel' or the solution to the heartwrenching, fictional scenario depicted in the film Armageddon.2 To others, it evokes a fantastical idea that may come to fruition in a distant reality. However, impressively funded companies have plans to send spacecraft to begin prospecting on asteroids within the next two years.' The issues associated with the mining of asteroids should be addressed before these plans are set in motion. Much has been written about the issues that might arise from allowing nations to own these space bodies and the minerals they contain; one such issue is the impact on international treaties.4 However, little has been written about the applicability of preexisting mining laws-which provide a basic property right scheme for the private sector-such as the General Mining Law of 1872 (Mining Law) to the management of asteroid mining.' The literature to date on how to legally address asteroid mining is minimal.' The articles that do address it propose the creation of different systems, such as a "property rights-based system that relies on the doctrine of first possession"7 or an international authority that would regulate mining operations.' Implementing a scheme that offers ownership of extracted resources without bestowing complete sovereignty is necessary to avoid an impending legal limbo-that is, an outer space "Wild West" equivalent where there is neither certainty nor security in who owns what.9 If private sector miners of asteroids know this right already exists, they will have more incentive to extract resources.' 0 This, in turn, would increase the chances of successful missions, resulting in numerous scientific and explorative benefits, along with the potential replenishment of key elements that are becoming increasingly depleted on Earth yet are still needed for modern industry. Scientists speculate that key elements needed for modern industry, including platinum, zinc, copper, phosphorus, lead, gold, and indium, could become depleted on Earth within the next fifty to sixty years." Many of these metals, such as platinum, are chemical elements that, unlike oil or diamonds, have no synthetic alternative.12 Once the reserves on Earth are mined to complete depletion, industries will be forced to recycle the existing supply of minerals, which will result in increased costs due to increased scarcity.' 3 However, evidence is accumulating that asteroids only a few hundred thousand miles away from Earth may be composed of an abundance of natural resources-including many of the minerals being mined to depletion on Earth-that could lead to vast profits." Most of the minerals being mined on Earth, including gold, iron, platinum, and palladium, originally came from the many asteroids that hit the Earth after the crust cooled during the planet's formation.'

#### Space mining is the only way to solve climate change

Duran 21, (Paloma Duran is a journalist and industry analyst at Mexico Business News, “Is Space Mining the Best Option to Face Climate Change?”), 11-03-21, Mexico Business News, https://mexicobusiness.news/mining/news/space-mining-best-option-face-climate-change // MNHS NL

Going to net zero means that more mining is needed. Experts have said that the current supply cannot support the necessary metals demand for the green transition. As a result, new mining alternatives have gained greater relevance, among them is space mining. Several countries, including Mexico, have shown their interest in this alternative, creating a new space race. “The solar system can support a billion times greater industry than we have on Earth. When you go to vastly larger scales of civilization, beyond the scale that a planet can support, then the types of things that civilization can do are incomprehensible to us … We would be able to promote healthy societies all over the world at the same time that we would be reducing the environmental burden on the Earth,” said Dr. Phil Metzger, Planetary Scientist at the University of Central Florida. Currently, there are several attempts to address global warming and transition to a net zero carbon economy. There has been an increasing interest in renewable energy and infrastructure, which has increased demand for various minerals, especially lithium, cobalt, nickel, copper and rare earth elements. However, according to experts, the world is close to entering a metals supercycle, where demand will exceed available supply, causing prices to skyrocket. Consequently, the mining industry has sought alternatives to achieve the required supply. Options include recycling and improved mine waste management, sea mining and space mining. The latter is considered one of the alternatives with the greatest potential. However, a regulatory framework is still lacking and there is almost no experience in this regard. Despite the lack of knowledge regarding space mining, it has become a very attractive option since the planet is running out of resources. While some people believe that land-based mining is cheaper than space mining, experts believe this may change in the long term. Furthermore, within the solar system there are countless bodies rich in minerals, ores and elements that will accelerate the fight against climate change. “There will come a point when there is nothing left to mine on the surface, prompting mines to reach even further below. But even those resources are destined to run out and so we will aim toward ocean mining, which already has specific technologies that are being developed. Nevertheless, even those mines are limited as well. The mine of the future, which today may seem unlikely, will no longer be on our planet. There will be a time when space mining will be as common as an open leach mine,” Eder Lugo, Minerals Head at Siemens, told MBN. More than 150 million asteroids measuring approximately 100m are believed to be in the inner solar system alone. In addition, astronomers have also identified abundant minerals near the Earth’s space and the Main Asteroid Belt. There are three main groups into which asteroids are divided: C- type, S- type, and M- type. The last two groups are the most abundant in minerals such as gold, platinum, cobalt, zinc, tin, lead, indium, silver, copper and rare earth metals. "Energy is limited here. Within just a few hundred years, you will have to cover all of the landmass of Earth in solar cells. So, what are you going to do? Well, what I think you are going to do is you are going to move out in space … all of our heavy industry will be moved off-planet and Earth will be zoned residential and light-industrial,” said Jeff Bezos, Founder of Amazon and the Space Launch Provider Blue Origin.

#### Anthropogenic warming causes extinction --- mitigation efforts now are key

Griffin, 2015 (David, Professor of Philosophy at Claremont, “The climate is ruined. So can civilization even survive?”, CNN, 4/14/2015, <http://www.cnn.com/2015/01/14/opinion/co2-crisis-griffin/> )

Although most of us worry about other things, climate scientists have become increasingly worried about the survival of civilization. For example, Lonnie Thompson, who received the U.S. National Medal of Science in 2010, said that virtually all climatologists "are now convinced that global warming poses a clear and present danger to civilization." Informed journalists share this concern. The climate crisis "threatens the survival of our civilization," said Pulitzer Prize-winner Ross Gelbspan. Mark Hertsgaard agrees, saying that the continuation of global warming "would create planetary conditions all but certain to end civilization as we know it." These scientists and journalists, moreover, are worried not only about the distant future but about the condition of the planet for their own children and grandchildren. James Hansen, often considered the world's leading climate scientist, entitled his book "Storms of My Grandchildren." The threat to civilization comes primarily from the increase of the level of carbon dioxide (CO2) in the atmosphere, due largely to the burning of fossil fuels. Before the rise of the industrial age, CO2 constituted only 275 ppm (parts per million) of the atmosphere. But it is now above 400 and rising about 2.5 ppm per year. Because of the CO2 increase, the planet's average temperature has increased 0.85 degrees Celsius (1.5 degrees Fahrenheit). Although this increase may not seem much, it has already brought about serious changes. The idea that we will be safe from "dangerous climate change" if we do not exceed a temperature rise of 2C (3.6F) has been widely accepted. But many informed people have rejected this assumption. In the opinion of journalist-turned-activist Bill McKibben, "the one degree we've raised the temperature already has melted the Arctic, so we're fools to find out what two will do." His warning is supported by James Hansen, who declared that "a target of two degrees (Celsius) is actually a prescription for long-term disaster." The burning of coal, oil, and natural gas has made the planet warmer than it had been since the rise of civilization 10,000 years ago. Civilization was made possible by the emergence about 12,000 years ago of the "Holocene" epoch, which turned out to be the Goldilocks zone - not too hot, not too cold. But now, says physicist Stefan Rahmstorf, "We are catapulting ourselves way out of the Holocene." This catapult is dangerous, because we have no evidence civilization can long survive with significantly higher temperatures. And yet, the world is on a trajectory that would lead to an increase of 4C (7F) in this century. In the opinion of many scientists and the World Bank, this could happen as early as the 2060s. What would "a 4C world" be like? According to Kevin Anderson of the Tyndall Centre for Climate Change Research (at the University of East Anglia), "during New York's summer heat waves the warmest days would be around 10-12C (18-21.6F) hotter [than today's]." Moreover, he has said, above an increase of 4C only about 10% of the human population will survive. Believe it or not, some scientists consider Anderson overly optimistic. The main reason for pessimism is the fear that the planet's temperature may be close to a tipping point that would initiate a "low-end runaway greenhouse," involving "out-of-control amplifying feedbacks." This condition would result, says Hansen, if all fossil fuels are burned (which is the intention of all fossil-fuel corporations and many governments). This result "would make most of the planet uninhabitable by humans." Moreover, many scientists believe that runaway global warming could occur much more quickly, because the rising temperature caused by CO2 could release massive amounts of methane (CH4), which is, during its first 20 years, 86 times more powerful than CO2. Warmer weather induces this release from carbon that has been stored in methane hydrates, in which enormous amounts of carbon -- four times as much as that emitted from fossil fuels since 1850 -- has been frozen in the Arctic's permafrost. And yet now the Arctic's temperature is warmer than it had been for 120,000 years -- in other words, more than 10 times longer than civilization has existed. According to Joe Romm, a physicist who created the Climate Progress website, methane release from thawing permafrost in the Arctic "is the most dangerous amplifying feedback in the entire carbon cycle." The amplifying feedback works like this: The warmer temperature releases millions of tons of methane, which then further raise the temperature, which in turn releases more methane. The resulting threat of runaway global warming may not be merely theoretical. Scientists have long been convinced that methane was central to the fastest period of global warming in geological history, which occurred 55 million years ago. Now a group of scientists have accumulated evidence that methane was also central to the greatest extinction of life thus far: the end-Permian extinction about 252 million years ago. Worse yet, whereas it was previously thought that significant amounts of permafrost would not melt, releasing its methane, until the planet's temperature has risen several degrees Celsius, recent studies indicate that a rise of 1.5 degrees would be enough to start the melting. What can be done then? Given the failure of political leaders to deal with the CO2 problem, it is now too late to prevent terrible developments. But it may -- just may -- be possible to keep global warming from bringing about the destruction of civilization. To have a chance, we must, as Hansen says, do everything possible to "keep climate close to the Holocene range" -- which means, mobilize the whole world to replace dirty energy with clean as soon as possible.

## 4 – DA

#### Private appropriation key to space colonization – commercial exchanges promote development

Shakouri, 13 has an LL.M. in international law and is based in Tehran (Babak Shakouri “Space settlements on the Moon and elsewhere will create new legal issues” 4/1/13 <http://www.thespacereview.com/article/2269/1>) //NG

Once human settlements on nearby celestial bodies are established, their commercial exchanges with Earth will become an issue. Space migrants who choose to leave Earth and settle in an uncomfortable concrete or metal base on the Moon or Mars must have very strong incentives to step forth for such breathtaking adventure. There seems to be no greater reward than the lucrative economic opportunities found in a settlement on an alien surface full of potential resources.¶ The positive economic exchange rate with the Earth may assure the continuation and even expansion of space settlements on celestial bodies. Otherwise, settlers either will depend on equipment and reinforcements from Earth or go bankrupt. This may shed light on the importance of adopting suitable legal regime for human space settlements that, on one hand, fuels the needed investments for establishment of space settlements and, on the other hand, helps the efforts of inhabitants those settlements flourish economically and leads ultimately to their self-sufficiency.¶ There is sufficient evidence to suggest that the legal framework of a free market economic system incredibly suits the requirements of human settlements in space, since freedom of business and market innovation, together with recognition of private property, are the key elements in making the humans the first known spacefaring intelligent species.¶ Finally, the matter of the administrative legal regime of space settlements is another noteworthy issue to be considered. This matter, which is mainly categorized within the realm of administrative law, has attracted less attention in comparison with other legal aspects of outer space activities, but in no way should its importance and impact on future space settlement be disregarded.

#### Solves all extinction scenarios, including the aff, because we can escape earth before it becomes uninhabitable.

Baum 09 – (2009, Seth, visiting scholar at Columbia University's Center for Research on Environmental Decisions, PhD candidate in Geography with a focus on risk analysis, “Cost–benefit analysis of space exploration: Some ethical considerations,” Space Policy Volume 25, Issue 2, May 2009, Pages 75-80, science direct Ajones)

Another non-market benefit of space exploration is reduction in the risk of the extinction of humanity and other Earth-originating life. Without space colonization, the survival of humanity and other Earth-originating life becomes extremely difficult- perhaps impossible- over the very long-term. This is because the Sun, like all stars, changes in its composition and radiative output over time. The Sun is gradually converting hydrogen into helium, thereby getting warmer. In approximately 500 million to one billion years, this warming is projected to render Earth uninhabitable to life as we know it [25–26]. Humanity, if it still exists on Earth then, could conceivably develop technology by then to survive on Earth despite these radical conditions. Such technology may descend from present proposals to “geoengineer” the planet in response to anthropogenic climate change [27–28].3 However, the Sun later- approximately seven billion years later- loses mass that spreads into Earth’s orbit, causing Earth to slow, be pulled into the Sun, and evaporate. The only way life could survive on Earth may be if Earth, by sheer coincidence (the odds are on the order of one in 105 to one in 106 [29]) happens to be pulled out of the solar system by a star system that passes by. This process might enable life to survive on Earth much longer, although the chance of this is quite remote. While space colonization would provide a hedge against these very long-term astrological threats, it would also provide a hedge against the more immediate threats that face humanity and other species. These threats include nuclear warfare, pandemics, anthropogenic climate change, and disruptive technology [30]. Because these threats would generally only affect life on Earth and not life elsewhere,4 self-sufficient space colonies would survive these catastrophes, enabling life to persist in the universe. For this reason, space colonization has been advocated as a means of ensuring long-term human survival [32–33]. Space exploration projects can help increase the probability of long-term human survival in other ways as well: technology developed for space exploration is central to proposals to avoid threats from large comet and asteroid impacts [34–35]. However, given the goal of increasing the probability of long-term human survival by a certain amount, there may be more cost-effective options than space colonization (with costs defined in terms of money, effort, or related measures). More cost-effective options may include isolated refuges on Earth to help humans survive a catastrophe [36] and materials to assist survivors, such as a how-to manual for civilization [37] or a seed bank [38]. Further analysis is necessary to determine the most cost-effective means of increasing the probability of long-term human survival.

## 5 – DA

#### The plan is a space shock that causes Asian arms races – any multilateral space agreement shocks Japan.

Dean Cheng 9, Senior Research Fellow in the Asia Studies Center at the Heritage Foundation, Former Senior Analyst at the China Studies Division of the Center for Naval Analyses, Former Senior Analyst with Science Applications International Corporation, “Reflections On Sino-US Space Cooperation”, Space and Defense, Volume 2, Number 3, Winter 2009, https://www.usafa.edu/app/uploads/Space\_and\_Defense\_2\_3.pdf

Broader International Implications

Beyond the bilateral difficulties of cooperating with the PRC, it is also important to consider potential ramifications of Sino-US cooperation in space on the Asian political landscape. In particular, cooperation between Washington and Beijing on space issues may well arouse concerns in Tokyo and Delhi. Both of these nations have their own space programs, and while they are arguably not engaged in a “space race” with China (or each other), they are certainly keeping a close eye on developments regarding China. Of particular importance is Japan. The United States relationship with Japan is arguably its most important in East Asia. US interest in Japan should be self evident. Japan hosts 47,000 US troops and is the linchpin for forward US presence in that hemisphere. Japan is the second largest contributor to all major international organizations that buttress US foreign policy…. Japan is the bulwark for US deterrence and engagement of China and North Korea—the reason why those countries cannot assume that the United States will eventually withdraw from the region.35 For Japan, whose “peace constitution” forbids it from using war as an instrument of state policy, the United States is an essential guarantor of its security. Any move by the US that might undermine this view raises not only the prospect of weakening US-Japanese ties, but also potentially affecting Japan’s security policies. In this regard, then, it is essential not to engage in activities that would undercut perceptions of American reliability. Such moves, it should be noted, are not limited to those in the security realm. For example, the Nixon administration undertook several initiatives in the late 1960s and early 1970s that rocked Tokyo-Washington relations, and are still remembered as the “Nixon shocks.” While some of these were in the realm of security (including Nixon’s opening to China and the promulgation of the Nixon Doctrine), the others were in the trade area. These included a ten percent surcharge on all imports entering the US and suspended the convertibility of the dollar (i.e., removed the US from the gold standard).36 Part of the “shock” was the fundamental nature of these shifts. Even more damaging, however, was the failure of the Nixon Administration to consult their Japanese counterparts, catching them wholly off-guard. It took several years for the effects of these shocks to wear off. If the United States is intent upon expanding space relations with the PRC, then it would behoove it to consult Japan, in order to minimize the prospect of a “space shock.” Failing to do so may well incur a Japanese reaction. The decision on the part of Japan to build an explicitly intelligence-focused satellite was in response to the North Korean missile test of 1999, suggesting that Tokyo is fully capable of undertaking space-oriented responses when it is concerned.37 That, in turn, would potentially arouse the ire of China. The tragic history of Sino-Japanese relations continues to cast a baleful influence upon current interactions between the two states. If there is not a “space race” currently underway between Beijing and Tokyo, it would be most unfortunate if American actions were to precipitate one.

#### Japan will develop offensive strike---nuclear war

Kelly C. Wadsworth 19, Non-Resident Kelly Fellow at Pacific Forum at the Center for Strategic & International Studies, PhD Student in International Security Studies at the University of Pittsburgh, MBA and MA in International Studies (Korea Studies) at the University of Washington, Former Visiting Fellow at the Japan Institute of International Affairs, BA in International Relations and East Asia from the University of California, Davis, “Should Japan Adopt Conventional Missile Strike Capabilities?”, Asia Policy, Volume 14, Number 2, April 2019, p. 83-87

American proponents of Japan obtaining a conventional missile strike capability interviewed for this research argued that the United States could use a more capable ally in the region to address the threat posed by heightened Chinese naval activity. While that prospect might be a tempting short-term fix to offset the U.S. Department of Defense budget cuts over the last decade, the long-term interests of the United States in maintaining regional stability should also be considered. In addition to the negative reactions of Beijing and Seoul, a Japanese offensive strike capability could decrease regional confidence in the credibility of U.S. power in Asia. As noted above, some experts argue that if Japan strengthens its offensive capability, such a move might be interpreted by neighbors reliant on the U.S. nuclear umbrella as a sign that Tokyo is losing confidence in the United States’ credibility.71 This could start a chain reaction that causes more U.S. allies to hedge with China or to develop their own strike capabilities, further increasing instability in Asia. *China*. China would likely be the most vocal in its disapproval of a Japanese conventional missile strike capability, potentially offering not just harsh words but also harsh actions that could further decrease regional stability in an already tense security environment. China expressed dissent when Japan considered a preemptive strike option against the North Korean threat in 2006, arguing that the move was “extremely irresponsible” and would severely interfere with international diplomatic efforts, aggravating tensions in Northeast Asia.72 Over ten years later, the regional environment is even more tense as a result of North Korea’s acquisition of nuclear weapons and China’s island reclamation efforts in the East and South China Seas. Support from Washington for Tokyo’s armament would likely fuel Beijing’s narrative that an aggressive and hegemonic United States is fixated on containing China and would be used to justify China’s own increased militarization. It would likely also end any chance of dialogue between Washington and Beijing on facilitating peaceful resolutions to regional territorial disputes. Brad Roberts points out that adopting strike capability would assist Japan in cases where its interests do not align with those of the United States, as in potential gray-zone conflicts. 73 However, the ensuing heightened mistrust between the alliance partners and China may work to increase the likelihood of a gray-zone conflict—such as the 2010 collision of Japanese and Chinese boats in disputed territory—possibly escalating into war. In addition, if Japan had a conventional missile strike capability that could be used to “preempt” a perceived imminent attack from China, Beijing would in turn be more likely to consider preemption of Japanese strike abilities, causing a premature escalation of the crisis that would undoubtedly draw in the United States. *South Korea*. Despite significant progress on U.S.-ROK-Japan trilateral security cooperation in recent years, Japan-ROK military relations remain increasingly tense, a situation that could easily spiral out of control if Japan adopted an offensive capability.74 When Japan, sparked by North Korea’s provocations in 2006, publicly debated the legality of a “preemptive strike” option, South Korean officials bluntly expressed their negative opinion of Japan’s intentions. A spokesperson for the Blue House secretariat, for example, remarked, “We have been alerted by this display of Japan’s inclination to aggression,” and that Japan was using the crisis “as an excuse to beef up their military.”75 South Koreans demonstrated a similar sentiment after Tokyo’s 2014 CSD proposal, with a 2015 poll showing that the majority of the public (56.9%) perceived Japan as “militaristic,” up 3.8 percentage points from the previous year.76 If Tokyo were to push forward with the discussion of adopting a conventional missile strike capability, South Korean public opinion would likely become even more unfavorable toward Japan. At a time when enhanced trilateral cooperation is important to deter the evolving threats in the region, Japan advancing legislation to allow for conventional missile strike capabilities would likely derail those efforts, especially if labeled “preemptive.” Such a move could even push Seoul to hedge with Beijing, as the ROK is increasingly reluctant to join any initiative perceived to be aimed at containing China.77 With China as South Korea’s largest trading partner and the United States as its greatest security ally, the ROK is not eager to choose between the two sides. *Southeast Asia*. Countries in Southeast Asia are watching the Trump administration closely to see where Washington will draw the line on China’s military rise and growing regional assertiveness, and many are already hedging accordingly. For example, countries such as Vietnam and the Philippines are increasing their own conventional arsenal and naval capabilities as a result of Washington’s “slow erosion of credibility” in the region during the Obama administration.78 Defense of Japan 2018 seems to have confidence in the Trump administration’s commitment to maintaining a powerful presence in Asia.79 However, as discussed earlier, if Japan were to pursue an offensive defense strategy, the Southeast Asian countries could see this as a sign of Tokyo’s loss of faith in the United States’ willingness to uphold its defense commitments. China’s seizure of the Scarborough Shoal from the Philippines in 2012 has already eroded these countries’ confidence in the U.S. security guarantee to some extent.80 Declining credibility and corresponding hedging—through either growing armament or alignment with China—could not only further increase tensions and heighten the risk of a gray-zone escalation but also lead to greater Chinese military assertiveness and dominance in the region. *Summary* Despite the seemingly unbalanced nature of the U.S.-Japan alliance, the argument for “balancing” the alliance with Japan’s development of an independent conventional missile strike capability does not take into account important repercussions that could undermine both regional stability and U.S. credibility. In addition, updated Japanese defense guidelines, such as CSD, already give Japan a “greater role” in global security. Unless future U.S. administrations drastically reduce the U.S. military presence in Asia, the benefit of a more equal alliance would not outweigh the potential costs of Japan’s adoption of a conventional missile strike capability. CONCLUSION The arguments supporting Japan’s acquisition of a conventional missile strike capability do not hold weight in the current regional, economic, and alliance environments. The development of such a capability is not a practical solution for Japan to abate the threat from the DPRK, and the move could be perceived by China and South Korea as facilitating a U.S. strategy of containment. Traditional restrictions on the Japanese defense budget would not practically allow the buildup of the military capabilities required for a conventional missile strike force, a restriction that cannot be changed without support from a military-wary public. At first glance, a “normal” Japan that is capable of contributing to U.S. deterrence efforts might seem appealing from an alliance perspective, especially after the 2010 U.S. defense budget cuts, and an increasingly threatening regional security environment. Yet, though the U.S.-Japan alliance may be unbalanced in terms of capabilities, the United States has broader interests in regional stability that will be better promoted if Japan maintains a purely defensive force. A strike-capable Japan might not only escalate an already tense regional standoff with China but also elicit a harsh response from other countries against Tokyo and Washington. It could also erode the credibility of the U.S. nuclear umbrella, potentially leading to increased militarization throughout Asia. If the environment surrounding any of these three arguments changes—for example, if the United States’ actions discredit its reliability to protect Japan under the alliance, if Japanese public support allows an increase in the JSDF’s budget, or if the United States can no longer maintain a credible military deterrence in Asia—Japan would have a strong argument to move forward with conventional missile strike capabilities. In that case, both parties should exercise prudence in their public communications of planned alliance cooperation on the matter and about how or why the alliance would choose to employ such abilities. Hawkish suggestions of the potential to increase U.S. dominance in the region should be avoided.81 China is rightfully wary of any reference to conventional prompt global strike. Such rhetoric coming from Japan or the United States combined with the decision to move forward on conventional missile strike capabilities could be considered a threatening signal by Beijing.82 Without calculated prudence in regional dialogues, even the discussion of Tokyo acquiring conventional missile strike capabilities could ultimately worsen the regional security environment rather than improve it.

## Case

### Advantage

**On Aganaba-Jeanty 16: Just says that we need a legal mechanism, not that PTD solves all of these impacts independently. Don’t buy it absent a carded warrant for PTD working.**

#### Alt cause of debris – broad space privatization and existing debris.

Muelhapt et al 19 [(Theodore J., Center for Orbital and Reentry Debris Studies, Center for Space Policy and Strategy, The Aerospace Corporation, 30 year Space Systems Analyst and Operator, Marlon E. Sorge, Jamie Morin, Robert S. Wilson), “Space traffic management in the new space era,” Journal of Space Safety Engineering, 6/18/19, <https://doi.org/10.1016/j.jsse.2019.05.007>] TDI

The last decade has seen rapid growth and change in the space industry, and an explosion of commercial and private activity. Terms like NewSpace or democratized space are often used to describe this global trend to develop faster and cheaper access to space, distinct from more traditional government-driven activities focused on security, political, or scientific activities. The easier access to space has opened participation to many more participants than was historically possible. This new activity could profoundly worsen the space debris environment, particularly in low Earth orbit (LEO), but there are also signs of progress and the outlook is encouraging. Many NewSpace operators are actively working to mitigate their impact. Nevertheless, NewSpace represents a significant break with past experience and business as usual will not work in this changed environment. New standards, space policy, and licensing approaches are powerful levers that can shape the future of operations and the debris environment. 2. Characterizing NewSpace: a step change in the space environment In just the last few years, commercial companies have proposed, funded, and in a few cases begun deployment of very large constellations of small to medium-sized satellites. These constellations will add much more complexity to space operations. Table 1 shows some of the constellations that have been announced for launch in the next decade. Two dozen companies, when taken together, have proposed placing well over ~~20,000~~ [twenty thousand] satellites in orbit in the next ~~10~~ [10]years. For perspective, fewer than ~~8100~~[eight thousand one hundred] payloads have been placed in Earth orbit in the entire history of the space age, only 4800 [1] remain in orbit and approximately 1950 [2] of those are still active. And it isn't simply numbers – the mass in orbit will increase substantially, and long-term debris generation is strongly correlated with mass. [Table 1 Omitted] This table is in constant flux. It is based largely on U.S. filings with the Federal Communications Commission (FCC) and various press releases, but many of the companies here have already altered or abandoned their original plans, and new systems are no doubt in work. Although many of these large constellations may never be launched as listed, the traffic created if just half are successful would be more than double the number of payloads launched in the last 60 years and more than 6 times the number of currently active satellites. Current space safety, space surveillance, collision avoidance (COLA) and debris mitigation processes have been designed for and have evolved with the current population profile, launch rates and density of LEO space. By almost any metric used to measure activity in space, whether it is payloads in orbit, the size of constellations, the rate of launches, the economic stakes, the potential for debris creation, the number of conjunctions, NewSpace represents a fundamental change. 3. Compounding effects of better SSA, more satellites, and new operational concepts The changes in the space environment can be seen on this figurative map of low Earth orbit. Fig. 1 shows the LEO environment as a function of altitude. The number of objects found in each 10 km “bin” is plotted on the horizontal axis, while the altitude is plotted vertically. Objects in elliptical orbits are distributed between bins as partial objects proportional to the time spent in each bin. Some notable resident systems are indicated in blue text on the right to provide an altitude reference. The (dotted) red line shows the number of objects in the current catalog tracked by the U.S. Space Surveillance Network (SSN). All the COLA alerts and actions that must be taken by the residents are due to their neighbors in the nearby bins, so the currently visible risk is proportional to the red line. The red line of the current catalog does not represent the complete risk; it indicates the risk we can track and perhaps avoid. A rule of thumb is that the current SSN LEO catalog contains objects about 10 cm or larger. It is generally accepted that an impact in LEO with an object 1 cm or larger will cause damage likely to be fatal to a satellite's mission. Therefore, there is a large latent risk from unobserved debris. While we cannot currently track and catalog much smaller than 10 cm, experiments have been performed to detect and sample much smaller objects and statistically model the population at this size [3]. The (solid) blue line represents the model of the 1 cm and larger debris that is likely mission-ending, usually called lethal but not trackable. If LEO operators avoid collisions with all the objects in the red line, they are nonetheless inherently accepting the risk from the blue line. This risk is already present. The (dashed) orange line is an estimate of the population at 5 cm and larger and is thus an estimate of what the catalog might conservatively be a few years after the Space Fence, a new radar system being built by the Air Force, comes on line (currently planned for 2019) [4]. Commercial companies offering space surveillance services, such as LeoLabs, ExoAnalytics, Analytic Graphics Inc., Lockheed, and Boeing, might also add to the number of objects currently tracked. Space Policy Directive 3 (SPD-3) [13] specifically seeks to expand the use of commercial SSA services Existing operators can expect a sharp increase in the number of warnings and alerts they will receive because of the increase in the cataloged population. Almost all the increase will come from newly detected debris [5]. The pace of safety operations for each satellite on orbit will significantly change because of the increase in the catalog from the Space Fence. This effect is compounded because the NewSpace constellations described in Table 1 will drastically change the profile of satellites in LEO. The green bars in Fig. 1 represent the number of objects that will be added to the catalog (red or orange lines) from only the NewSpace large LEO constellations at their operational altitudes. This does not include the rocket stages that launch them, or satellites in the process of being phased into or removed from the operational orbits. Neighbors of one of these new constellations may face a radically different operations environment than their current practices were designed to address. Satellites in these large LEO constellations typically have planned operational lifetimes of 5–10 years. Some companies have proposed to dispose of their satellites using low thrust electric propulsion systems, which would spiral satellites down over a period of months or years from operating altitudes as high as 1500 km through lower orbits where the Hubble Space Telescope, the International Space Station, and other critical LEO satellites operate [6]. Similar propulsive techniques would raise replacement satellites from lower launch injection orbits to higher operational orbits. These disposal and replenishment activities will add thousands of satellites each year transiting through lower altitudes and posing a risk to all resident satellites in those lower orbits. More importantly, failures will occur both among transiting satellites and operational constellations, potentially leaving hundreds more stranded along the transit path.

**Probability – 0.1% chance of a space debris collision.**

**Salter 16** [(Alexander William, Economics Professor at Texas Tech) “SPACE DEBRIS: A LAW AND ECONOMICS ANALYSIS OF THE ORBITAL COMMONS” 19 STAN. TECH. L. REV. 221 \*numbers replaced with English words] TDI

The probability of a collision is currently low. Bradley and Wein estimate that the maximum probability in LEO of a collision over the lifetime of a spacecraft remains below one in one thousand, conditional on continued compliance with NASA’s deorbiting guidelines.3 However, the possibility of a future “snowballing” effect, whereby debris collides with other objects, further congesting orbit space, remains a significant concern.4 Levin and Carroll estimate the average immediate destruction of wealth created by a collision to be approximately $30 million, with an additional $200 million in damages to all currently existing space assets from the debris created by the initial collision.5 The expected value of destroyed wealth because of collisions, currently small because of the low probability of a collision, can quickly become significant if future collisions result in runaway debris growth.

**Time frame – Kessler effect 200 years away**

**Stubbe 17** [(Peter, PhD in law @ Johann Wolfgang Goethe University Frankfurt) “State Accountability for Space Debris: A Legal Study of Responsibility for Polluting the Space Environment and Liability for Damage Caused by Space Debris,” Koninklijke Brill Publishing, ISBN 978-90-04-31407-8, p. 27-31] TDI

The prediction of possible scenarios of the future evolution of the debris p o p ulation involves many uncertainties. Long-term forecasting means the prediction of the evolution of the future debris environment in time periods of decades or even centuries. Predictions are based on models84 that work with certain assumptions, and altering these parameters significantly influences the outcomes of the predictions. Assumptions on the future space traffic and on the initial object environment are particularly critical to the results of modeling efforts.85 A well-known pattern for the evolution of the debris population is the so-called Kessler effect’, which assumes that there is a certain collision probability among space objects because many satellites operate in similar orbital regions. These collisions create fragments, and thus additional objects in the respective orbits, which in turn enhances the risk of further collisions. Consequently, the num ber of objects and collisions increases exponentially and eventually results in the formation of a self-sustaining debris belt aroundthe Earth. While it has long been assumed that such a process of collisional cascading is likely to occur only in a very long-term perspective (meaning a time 1 n of several hundred years),87 a consensus has evolved in recent years that an uncontrolled growth of the debris population in certain altitudes could become reality much sooner.88 In fact, a recent cooperative study undertaken by various space agencies in the scope of i a d c shows that the current l e o debris population is unstable, even if current mitigation measures are applied. The study concludes:Even with a 90% implementation of the commonly-adopted mitigation measures [...] the l e o debris population is expected to increase by an average of 30% in the next 200 years. The population growth is primarily driven by catastrophic collisions between 700 and 1000 km altitudes and such collisions are likely to occur every 5 to 9 years.89

#### Turn - space debris creates existential deterrence and a taboo around space conflict

Bowen 18 [(Bleddyn, lecturer in International Relations at the University of Leicester) “The Art of Space Deterrence,” European Leadership Network, February 20, 2018, <https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/>] TDI

Fourth, the ubiquity of space infrastructure and the fragility of the space environment may create a degree of existential deterrence. As space is so useful to modern economies and military forces, a large-scale disruption of space infrastructure may be so intuitively escalatory to decision-makers that there may be a natural caution against a wholesale assault on a state’s entire space capabilities because the consequences of doing so approach the mentalities of total war, or nuclear responses if a society begins tearing itself apart because of the collapse of optimised energy grids and just-in-time supply chains. In addition, the problem of space debris and the [political-legal hurdles to conducting debris clean-up](https://doi.org/10.1080/14777622.2014.890489) operations mean that even a handful of explosive events in space can render a region of Earth orbit unusable for everyone. This could caution a country like China from excessive kinetic intercept missions because its own military and economy is increasingly reliant on outer space, but perhaps not a country like North Korea which does not rely on space. The usefulness, sensitivity, and fragility of space may have some existential deterrent effect. [China’s catastrophic anti-satellite weapons test in 2007](https://defenceindepth.co/2017/01/11/chinas-space-weapons-test-ten-years-on-behemoth-pulls-the-peasants-plough/) is a valuable lesson for all on the potentially devastating effect of kinetic warfare in orbit.

#### No war over satellites

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.

**No ‘space war’ – Insurmountable barriers and everyone has an interest in keeping space peaceful**

**Dobos 19** [(Bohumil Doboš, scholar at the Institute of Political Studies, Faculty of Social Sciences, Charles University in Prague, Czech Republic, and a coordinator of the Geopolitical Studies Research Centre) “Geopolitics of the Outer Space, Chapter 3: Outer Space as a Military-Diplomatic Field,” Pgs. 48-49] TDI

Despite the theorized potential for the achievement of the terrestrial dominance throughout the utilization of the ultimate high ground and the ease of destruction of space-based assets by the potential space weaponry, the utilization of space weapons is with current technology and no effective means to protect them far from fulfilling this potential (Steinberg 2012, p. 255). In current global international political and technological setting, the utility of space weapons is very limited, even if we accept that the ultimate high ground presents the potential to get a decisive tangible military advantage (which is unclear). This stands among the reasons for the lack of their utilization so far. Last but not the least, it must be pointed out that the states also develop passive defense systems designed to protect the satellites on orbit or critical capabilities they provide. These further decrease the utility of space weapons. These systems include larger maneuvering capacities, launching of decoys, preparation of spare satellites that are ready for launch in case of ASAT attack on its twin on orbit, or attempts to decrease the visibility of satellites using paint or materials less visible from radars (Moltz 2014, p. 31). Finally, we must look at the main obstacles of connection of the outer space and warfare. The first set of barriers is comprised of physical obstructions. As has been presented in the previous chapter, the outer space is very challenging domain to operate in. Environmental factors still present the largest threat to any space military capabilities if compared to any man-made threats (Rendleman 2013, p. 79). A following issue that hinders military operations in the outer space is the predictability of orbital movement. If the reconnaissance satellite's orbit is known, the terrestrial actor might attempt to hide some critical capabilities-an option that is countered by new surveillance techniques (spectrometers, etc.) (Norris 2010, p. 196)-but the hide-and-seek game is on. This same principle is, however, in place for any other space asset-any nation with basic tracking capabilities may quickly detect whether the military asset or weapon is located above its territory or on the other side of the planet and thus mitigate the possible strategic impact of space weapons not aiming at mass destruction. Another possibility is to attempt to destroy the weapon in orbit. Given the level of development for the ASAT technology, it seems that they will prevail over any possible weapon system for the time to come. Next issue, directly connected to the first one, is the utilization of weak physical protection of space objects that need to be as light as possible to reach the orbit and to be able to withstand harsh conditions of the domain. This means that their protection against ASAT weapons is very limited, and, whereas some avoidance techniques are being discussed, they are of limited use in case of ASAT attack. We can thus add to the issue of predictability also the issue of easy destructibility of space weapons and other military hardware (Dolman 2005, p. 40; Anantatmula 2013, p. 137; Steinberg 2012, p. 255). Even if the high ground was effectively achieved and other nations could not attack the space assets directly, there is still a need for communication with those assets from Earth. There are also ground facilities that support and control such weapons located on the surface. Electromagnetic communication with satellites might be jammed or hacked and the ground facilities infiltrated or destroyed thus rendering the possible space weapons useless (Klein 2006, p. 105; Rendleman 2013, p. 81). This issue might be overcome by the establishment of a base controlling these assets outside the Earth-on Moon or lunar orbit, at lunar L-points, etc.-but this perspective remains, for now, unrealistic. Furthermore, no contemporary actor will risk full space weaponization in the face of possible competition and the possibility of rendering the outer space useless. No actor is dominant enough to prevent others to challenge any possible attempts to dominate the domain by military means. To quote 2016 Stratfor analysis, "(a) war in space would be devastating to all, and preventing it, rather than finding ways to fight it, will likely remain the goal" (Larnrani 20 16). This stands true unless some space actor finds a utility in disrupting the arena for others.

**Kessler effect doesn’t take out all sats, only limits useful orbits, we only need a few satellites to monitor weather and militaries**

**Space weather NQ – even if we can monitor, we don’t know how to stop it**