## 1

#### CP: States should, through UN treaty, formally establish warning zones around satellites.

#### The CP means states would establish the area 200km away from their satellites as a designated self-defense zone, creating a deterrent effect. That solves ASAT proliferation and miscalc + the aff but doesn’t violate or change the OST and current space norms.

Cerny et. al 21[Michael B. Cerny is an Oxford MPhil candidate and has a Bachelor’s in International Relations from Emory University, Raphael J. Piliero is a Fulbright Scholar in Taiwan and has a Bachelors from Georgetown University. David Bernstein has a Bachelors from Georgetown, Brandon W. Kelley is the Associate Director of Debate at Georgetown , May 2021,*Space and Missile Wars: What Awaits*, Chapter 5: Countering Co-Orbital ASATs: Warning Zones in GEO as a Lawful Trigger for Self-Defense https://npolicy.org/wp-content/uploads/2021/05/Space\_and\_Missile\_Wars.pdf, 12-18-2021 amrita]

Ascertaining intent is at the heart of addressing the risks posed by co-orbital ASATs. Chow writes that prohibiting passage through a zone around a satellite is impossible because of the difficulty distinguishing between co-orbital ASATs and civilian satellites, and the necessity of these forms of passage for regular satellite operations.408 In a maritime context, warning zones allow ships to navigate a similar dilemma. In the global War on Terror, it can be difficult for navies to distinguish between threatening and peaceful civilian seacraft, so warning zones have been applied by navies to ascertain the intent of seacraft as they pass through a warning zone.409 By establishing a "defense bubble" around the naval vessels, warning zones allow commanders to ascertain the intent of incoming seacraft, whether they be warships, small boats, or jet skis.410 Furthermore, by direct ing all maritime traffic around the zone and requiring that all traffic passing through the zone communicate their intentions, commanders are able to clarify any threats and determine the need to invoke self-defense.411 Upon notice, state or civilian seacraft might avoid entering the zone itself or choose to do so while communicating their intent to the United States Navy.412 **The unilateral establishment of warning zones around U**nited **S**tates satellites **presents a** potential **solution to** the threat of **co-orbital ASATs without violating Articles I and II of the OST**. First, the establishment of warning zones would not limit ‘free access’ to the area of the zone as specified by Article I. According to the general practice of warning zones, the establishment of the zone itself does not limit another state from entering the area. Furthermore, the penetration of the zone by another state does not license the use of force by the state enforcing the zone. As explained by the Commander’s Handbook— "Specifically, when operating in international waters, commanders may assert notice (via notices to airmen and notices to mariners) that within a certain geographic area for a certain period of time dangerous military activities will be taking place. Commanders may request that entities traversing the area communicate with them and state their intentions. Moreover, such notice may include reference to the fact that if ships and aircraft traversing the area are deemed to represent an imminent threat to US naval forces, they may be subject to proportionate measures in self-defense. Ships and aircraft are not required to remain outside such zones and force may not be used against such entities merely because they entered the zone. Commanders may use force against such entities only to defend against a hostile act or demonstrated hostile intent, including interference with declared military activities."413 **Warning zones** would **also avoid the ‘national appropriation’ principle** under Article II. Referring back to the initial three qualifications of the treaty, the first of these qualifications is that national appropriation is prohibited "by claim of sovereignty."414 As our previous analysis suggests, warning zones would not constitute a claim of sovereignty because they do not grant any sovereign right over the area of outer space. As a result, we direct our analysis towards the secondary and tertiary qualifications of what constitutes national appropriation "by means of use or occupation," or "by any other means."415

## 2

#### Renewable Energy is not sufficient to transition away from fossil fuels—SBSP is the only realistic plan to move away by 2100

Snead 21—Mike Snead; president of the Spacefaring Institute; “The Coming Age of Astroelectricity”; September 2021; *Space Renaissance International 3rd World Congress*; <https://www.researchgate.net/publication/354783694_The_Coming_Age_of_Astroelectricity#read>; (AG DebateDrills)

World political leaders have agreed that achieving worldwide economic development and the eradication of poverty should be “the first and overriding priorities” of developing nations. Further, they have emphasized that this should be done as soon as is practicable in a sustainable manner which, by common sense, undertakes an orderly transition to sustainable energy. The preceding analysis indicates that to achieve these priorities, terrestrial sustainable energy sources are significantly inadequate given the large and growing population and the desired global middle-class standard of living. Anthropologist Leslie White, drawing on his observations of the growth and decline of past civilizations, concluded: Nearly a century ago, space philosopher Konstantin Eduardovich Tsiolkovsky foresaw the coming need for humanity to utilize the immense natural extraterrestrial resources of the solar system to continue to grow and prosper. Clearly, our civilization has now reached this key nexus where an extraterrestrial energy resource must be tapped if continued growth is to be achieved and cultural collapse is to be avoided. A half-century ago, Peter Glaser invented space solar power-generated astroelectricity. What Glaser recognized was that while the space surrounding the Earth appears devoid of anything, it is actually constantly filled with substantial solar energy that cannot directly be seen. Glaser conceived large space platforms that would collect sunlight, turn this into green electricity, and transmit this power to ground receiving stations, called astroelectric plants, where it emerges as astroelectricity. (See Figure 7.) When combined with terrestrial nuclear and renewable energy sources, producing astroelectricity is how we can undertake an orderly worldwide transition to abundant sustainable energy. The number of astroelectric plants needed Based on Glaser’s patent, NASA and the U.S. Department of Energy undertook a substantial study of space solar power in the late 1970s and early 1980s. A baseline system design was developed that would deliver 5 GW of astroelectricity—equivalent to five 1-GW nuclear power plants. This electrical power would be almost continuously dispatchable. 18 For this preliminary planning estimate, 20 percent of the 50,000 GW of green electrical power needed in 2100 will be assumed to come from terrestrial sources. 19 This means that terrestrial sustainable energy sources will supply the equivalent of 10,000 GW of continuous green electrical power while the remaining 40,000 GW will be supplied by astroelectricity. With each astroelectric plant supplying 5 GW, 8,000 GEO space solar power platforms and the same number of astroelectricity plants will be needed. At 8,000 locations around the world, a dispatchable power supply equal to 2.5 Hoover Dams will be built to enable global sustainable development. perimeter.20 (See Figure 8.) In total, about 1.3 million square kilometers of land would be needed—far less than any combination of terrestrial alternatives. Recall that an allwind solution will require nearly 60 million square kilometers and an all-ground solar solution would need over 6 million square kilometers. Land area needed for the astroelectric plants In NASA’s baseline design, an astroelectric plant built at 35 degrees latitude would require 164 square kilometers of land for the receiving antenna array and a safety

#### SBSP is on the path to begin in 2050—in time to keep climate change to 1.5 degrees

GlobalData Energy 21—Global Data Energy; As the gold standard data provider to the world's largest industries, we continuously collect and analyze terabytes of data to create the most comprehensive, authoritative, and granular market intelligence; “Here comes the sun: space-based solar power is on the horizon”; <https://www.power-technology.com/comment/here-comes-the-sun-space-based-solar-power-is-on-the-horizon/>; (AG DebateDrills)

Space-based solar power (SBSP) is edging closer to becoming a reality and, in the long term, could help complete the transition to green energy sources. The idea of lasers in the sky was the exclusive domain of science fiction novels or scheming James Bond villains. Now it is becoming a reality, and, unlike the movies, it can be used as a force for good, helping tackle some of the most pressing challenges facing the world. In its Tech, Media and Telecom (TMT) Predictions 2021 report, GlobalData identified sustainability as a key theme for 2021. Transitioning to clean sources of energy is perhaps the most pressing item on the agenda to limit global warming to the 1.5 °C target set by the Paris Agreement. The energy sector is the world’s number one pollutant, accounting for over 30% of global greenhouse gas (GHG) emissions, according to the Centre for Climate and Energy Solutions. SBSP could be a solution to the energy problem. As GlobalData predicts in its report, Earth-facing activities in space will experience significant growth in the next decade, increasingly affecting our everyday lives and contributing to solving complex challenges. But how would energy from space be collected? The optimum solution is using huge mirror-like solar reflectors installed on satellites in orbit which will concentrate energy from the sun onto solar panels. These, in turn, turn the energy into electromagnetic radiation which is beamed back to Earth in either laser or microwave form by an antenna. Finally, a rectifying antenna on the ground collects the waves or electromagnetic radiations from lasers and converts them back into electricity to be distributed to the grid. This technology has several advantages over normal solar power. Firstly, it eliminates downtime due to bad weather and nighttime. In an average winter month in Europe, only 3% of sunlight reaches Earth, while satellites in space could gather energy for 99% of the year. Secondly, it bypasses the problem of energy storage as the continuous stream of power from the sun would allow the energy to be beamed down directly when needed. Finally, the light in space, unfiltered by the atmosphere, is much stronger. For this reason, according to energy matching service Greenmatch, SBSP could generate 40 times as much energy as Earth-based solar power. Technological advances meet commercial reality Despite its many advantages, there is one major drawback to this alternative source of energy: the astronomical cost. While in theory the technologies needed to make SBSP a reality already exist, the cost of production, launch, and assembly (which would most likely have to happen in space), currently make it commercially unviable. The technological advances made in recent years, however, have significantly lowered launch costs, raising hopes for the future. Currently, the key players in SBSP include the Chinese, US and Japanese governments of China, which are all eager to secure access to a clean, unlimited power sources. China, for example, is planning on sending the first functioning prototype into space as soon as 2022, with intentions of making SBSP commercially viable by 2050. SBSP could be the route to ensure Earth’s energy needs are met in the long-term, with the first country to achieve it gaining a geopolitical and commercial advantage. That’s arguably a better story than even a Bond movie!

#### The Private Sector is key—only they create the demand structure needed to reduce the costs

Sarang 21—Mehak Sarang; Mehak is also a Research Associate at Harvard Business School with Professor Matthew Weinzierl, researching the business and economics of the space sector; The Commercial Space Age Is Here; Feb 12 2021; Harvard Business Review; <https://hbr.org/2021/02/the-commercial-space-age-is-here>; (AG DebateDrills)

In our [recent research](https://www.hbs.edu/faculty/Publication%20Files/jep.32.2.173_Space,%20the%20Final%20Economic%20Frontier_413bf24d-42e6-4cea-8cc5-a0d2f6fc6a70.pdf), we examined how the model of centralized, government-directed human space activity born in the 1960s has, over the last two decades, made way for a new model, in which public initiatives in space increasingly share the stage with private priorities. Centralized, government-led space programs will inevitably focus on space-for-earth activities that are in the public interest, such as national security, basic science, and national pride. This is only natural, as expenditures for these programs must be justified by demonstrating benefits for citizens — and the citizens these governments represent are (nearly) all on earth.

In contrast to governments, the private sector is eager to put people in space to pursue their own personal interests, not the state’s — and then supply the demand they create. This is the vision driving SpaceX, which in its first twenty years has entirely upended the rocket launch industry, securing 60% of the global commercial launch market and building ever-larger spacecraft designed to ferry passengers not just to the International Space Station (ISS), but also to its own promised [settlement on Mars](https://www.spacex.com/media/making_life_multiplanetary_transcript_2017.pdf).

Today, the space-for-space market is limited to supplying the people who are already in space: that is, the handful of astronauts employed by NASA and other government programs. While SpaceX has grand visions of supporting large numbers of private space travelers, their current space-for-space activities have all been in response to demand from government customers (i.e., NASA). But as decreasing launch costs enable companies like SpaceX to leverage economies of scale and put more people into space, growing private sector demand (that is, tourists and settlers, rather than government employees) could turn these proof-of-concept initiatives into a sustainable, large-scale industry.

This model — of selling to NASA with the hopes of eventually creating and expanding into a larger private market — is exemplified by SpaceX, but the company is by no means the only player taking this approach. For instance, while SpaceX is focused on space-for-space transportation, another key component of this burgeoning industry will be manufacturing.

[Made In Space, Inc.](https://madeinspace.us/capabilities-and-technology/archinaut/) has been at the forefront of manufacturing “in space, for space” since 2014, when it 3D-printed a wrench onboard the ISS. Today, the company is exploring other products, such as high-quality fiber-optic cable, that terrestrial customers may be willing to pay to have manufactured in zero-gravity. But the company also recently received a [$74 million contract](https://www.nasa.gov/press-release/nasa-funds-demo-of-3d-printed-spacecraft-parts-made-assembled-in-orbit) to 3D-print large metal beams in space for use on NASA spacecraft, and future private sector spacecraft will certainly have similar manufacturing needs which Made In Space hopes to be well-positioned to fulfill. Just as SpaceX has begun by supplying NASA but hopes to eventually serve a much larger, private-sector market, Made In Space’s current work with NASA could be the first step along a path towards supporting a variety of private-sector manufacturing applications for which the costs of manufacturing on earth and transporting into space would be prohibitive.

Another major area of space-for-space investment is in building and operating space infrastructure such as habitats, laboratories, and factories. Axiom Space, a current leader in this field, recently [announced](https://www.theverge.com/2021/1/26/22250327/space-tourists-axiom-private-crew-iss-price) that it would be flying the “first fully private commercial mission to space” in 2022 onboard SpaceX’s Crew Dragon Capsule. Axiom was also [awarded](https://spacenews.com/nasa-selects-axiom-space-to-build-commercial-space-station-module/) a contract for exclusive access to a module of the ISS, facilitating its plans to develop modules for commercial activity on the station (and eventually, beyond it).

This infrastructure is likely to spur investment in a wide array of complementary services to supply the demand of the people living and working within it. For example, in February 2020, Maxar Technologies was awarded a [$142 million contract](https://www.builtincolorado.com/2020/02/03/maxar-technologies-142m-nasa-contract) from NASA to develop a robotic construction tool that would be assembled in space for use on low-Earth orbit spacecraft. Private sector spacecraft or settlements will no doubt have need for a variety of similar construction and repair tools.

And of course, the private sector isn’t just about industrial products. Creature comforts also promise to be an area of rapid growth, as companies endeavor to support the human side of life in the harsh environment of space. In 2015, for example, [Argotec and Lavazza](https://www.lavazza.com/en/about-us/media-centre/isspresso-successfully-completes-the-mission-coffee-in-space.html) collaborated to build an espresso machine that could function in the zero-gravity environment of the ISS, delivering a bit of everyday luxury to the crew.

To be sure, people have dreamt of using the vacuum and weightlessness of space to source or make things that cannot be made on earth for half a century, and time and again the business case has failed to pan out. Skepticism is natural. Those failures, however, have been in space-for-earth applications. For example, two startups of the 2010s, [Planetary Resources, Inc.](https://store.hbr.org/product/planetary-resources-inc-property-rights-and-the-regulation-of-the-space-economy/717053) and [Deep Space Industries](https://spacenews.com/deep-space-industries-acquired-by-bradford-space/), recognized the potential of space mining early on. For both companies, however, the lack of a space-for-space economy meant that their near-term survival depended on selling mined material — precious metals or rare elements — to earthbound customers. When it became clear that demand was insufficient to justify the high costs, funding dried up, and both companies pivoted to other ventures.

These were failures of space-for-earth business models — but the demand for in-space mining of raw building material, metals, and water will be enormous once humans are living in space (and are therefore far cheaper to supply). In other words, when people are living and working in space, we are likely to look back on these early asteroid mining companies less as failures and more as simply [ahead of their time](https://interestingengineering.com/asteroid-mining-to-shape-the-future-of-our-wealth).

#### Megaconstellations are key to advancing tech and lowering costs

David 21-- Leonard David; Leonard David is an award-winning space journalist who has been reporting on space activities for more than 50 years; Space solar power's time may finally be coming; Nov 3 2021; *Space.com*; <https://www.space.com/space-solar-power-research-advances>; (AG DebateDrills)

Another recent change is the dawn of the megaconstellations, Mankins added. That's exemplified by SpaceX's Starlink broadband network, a mass-production effort that now cranks out 30 tons of satellites a month. SpaceX is on course to potentially manufacture 40,000 satellites within five years, and launch all of them. "The path to low-cost hardware has been shown," Mankins said. "It's modular and mass-produced. The hurdles of less-expensive launch and lowering hardware costs have been overcome." Mankins said that the economics of SSP concepts in the near term, within the next decade, have never been more viable. He flagged advances in space launch capabilities; progress in robotics for space assembly, maintenance and servicing systems; and the growth in various component technologies, such as high-efficiency solid state power amplifiers. As a result, SSP is ready to see the light of day, Mankins said.

#### Further, the aff kills investor confidence gained from the SPACE Act, ending all expensive ventures into space by private industry

Taichman 21 [Elya Taichman is currently obtaining his J.D. at Temple University Beasley School of Law where he is a Beasley Scholar, a Law and Public Policy Scholar, and a Staff Editor on the Temple Law Review. Elya Taichman is the former Legislative Director for Congresswoman Michelle Lujan Grisham (current Governor of New Mexico). Elya advised the Congresswoman on foreign policy, national security, space, and economic issues., 2021, The Artemis Accords: Employing Space Diplomacy to De-Escalate a National Security Threat and Promote Space Commercialization,https://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=1131&context=nslb, 12-15-2021 amrita]

U.S. Commercial Space Launch Competitiveness Act of 2015 (“Space Act”): The Dawn of the Second Space Age Until recently, it did not matter that the OST was unclear, and the Moon Treaty failed to garner support. Space exploration remained the province of state actors like NASA because the sheer expense of rocketry and other technologies remained beyond the reach of private corporations and investors throughout the twentieth century.61 However, over the last two decades the industry has changed rapidly. In the United States alone, several of the most innovative companies have invested in space exploration technology.62 As the research accelerates, costs have decreased, and the potential for profits is tremendous – in 2018 the space economy was $360 billion.63 By 2040, its estimated worth is anywhere between $1.1 trillion and $1.7 trillion.64 However, investors demand certainty, and the uncertainty surrounding OST interpretation was reason to pause.65 After all, no investor or company wanted to pour millions, or even billions, into a company designed to mine liquid ice on the Moon only to discover that this violated international law and that the United States had decided to stop licensing such ventures. Just as President Eisenhower feared, the military-industrial complex, augmented by private industry, lobbied Congress heavily to reduce regulatory hurdles and legal uncertainty in space investment.66 In 2015, their efforts bore fruit when Congress passed the Space Act, which President Obama signed into law.67 Chapter 513 of Subtitle V – “Space Resource Commercial Exploration and Utilization” – was the shift that enabled the American private space industry to flourish. This affirmed that American citizens could own and sell any “space resources” that were obtained through “commercial recovery.”68 In one stroke, Congress guaranteed property rights to American citizens and companies on a “first come, first served basis.”69 Moreover, American courts would not permit foreign lawsuits accusing entrepreneurs and businesses of violating the OST.70 The law also required the executive branch to “discourage government barriers” to development and for regulation to “facilitate commercial utilization” in space.71 Finally, it required the President to promote the interest of the American space industry.72 Ever wary of the ambiguities of the OST, and likely out of concern that the Space Act might violate the treaty, the law included a disclaimer that it was the sense of Congress that nothing in the Space Act asserted American sovereignty over any celestial body.73 This disclaimer should be read as opinio juris of American interpretation of the OST. In 1967, the United States and the Soviet Union shared a concern that other nations would challenge their technological preeminence in space.74 In 2015, this proved no different, except, this time, the United States was alone in its preeminence. Russia, in fact, strongly objected and claimed that the Space Act violated international law.75 Russia submitted an objection to the United Nations Committee on the Peaceful Uses of Outer Space (“COPUOS”), claiming the Space Act demonstrated “tot al disrespect for international law order [sic].”76 Russia went on to declare that this law manifested a “doctrine of domination in outer space.”77 Nonetheless, a careful reading of Russia’s complaint to COPUOS elucidates that Russia never actually asserted that the United States violated the OST.78 To be sure, Russia came as close as possible to this, but never outright said it.79 Indeed, the Russians lag behind in investment in outer space and technology and fear American exploitation of space’s vast resources in space without their participation.80 American private investment has accelerated this gap with NASA paying companies like SpaceX $55 million per seat to ferry astronauts to the ISS instead paying the Russians more than $90 million to do the same.81 In fact, in its objection to the Space Act, Russia stated that the United States “could propose discussing the possibility to reach uniform understanding of the status of resources and set forth the structure of the doctrine that would include safety and security aspects.”82 It seems Russia is pining for its prior role of crafting space law with the United States. This also suggests that if Russia had the same capabilities as the United States, its policy would likely be comparable.83

#### The impact is extinction—only quickly finding solutions prevents us from reaching tipping points

Sears 21-- Sears, Nathan Alexander. "Great Powers, Polarity, and Existential Threats to Humanity: An Analysis of the Dis-tribution of the Forces of Total Destruction in International Security." (2021).

Thus, the assumption here is that a Hothouse Earth climate could pose an existential threat to the habitability of the planet for humanity (Steffen et al. 2018., 5). At what point could climate change cross the threshold of an existential threat to humankind? The complexity of Earth’s natural systems makes it extremely difficult to give a precise figure (Rockstrom et al. 2009; ). However, much of the concern about climate change is over the danger of crossing “tipping points,” whereby positive feedback loops in Earth’s climate system could lead to potentially irreversible and self-reinforcing “runaway” climate change. For example, the melting of Arctic “permafrost” could produce additional warming, as glacial retreat reduces the refractory effect of the ice and releases huge quantities of methane currently trapped beneath it. A recent study suggests that a “planetary threshold” could exist at global average temperature of 2°C above preindustrial levels (Steffen et al. 2018; also IPCC 2018). Therefore, the analysis here takes the 2°C rise in global average temperatures as representing the lower-boundary of an existential threat to humanity, with higher temperatures increasing the risk of runaway climate change leading to a Hothouse Earth. The Paris Agreement on Climate Change set the goal of limiting the increase in global average temperatures to “well below” 2°C and to pursue efforts to limit the increase to 1.5°C. If the Paris Agreement goals are met, then nations would likely keep climate change below the threshold of an existential threat to humanity. According to Climate Action Tracker (2020), however, current policies of states are expected to produce global average temperatures of 2.9°C above preindustrial levels by 2100 (range between +2.1 and +3.9°C), while if states succeed in meeting their pledges and targets, global average temperatures are still projected to increase by 2.6°C (range between +2.1 and +3.3°C). Thus, while the Paris Agreements sets a goal that would reduce the exis 6 - tential risk of climate change, the actual policies of states could easily cross the threshold that would constitute an existential threat to humanity (CAT 2020). How do the CO2 emissions of the leading states affect the existential risk of climate change? One way to measure this would be to compare the leading states’ CO2 emissions against the global “carbon budget”—or the amount of CO2 emissions over a period of time that would keep global average temperature below the existential threshold of +2.0°C above preindustrial levels (IPCC 2018). If any of the leading state’s CO2 emissions—existing or projected—are equal to the global carbon budget, then this would constitute an absolute existential threat capability. None of the leading states appear to possess such an absolute existential threat capability. For example, the benchmark of total global annual CO2 equivalent emissions for a +2.0°C “compatible pathway” are 46 billion tonnes (bt) in 2025 and 38bt in 2030 (CAT 2020). China’s CO2 emissions are by far the largest amongst the leading states, which amounted to 10.17bt in 2019 and are expected to climb to somewhere below 15bt in the period between 2025 and 2030. China’s emissions are therefore far below the global carbon budget. Similarly, one 2019 study by the International Energy Agency estimated a remaining global carbon budget of 880 billion tonnes for having a 66% change of remaining well below 2.0°C (or 1.8°C) (Dalman 2020). Assuming China’s CO2 emissions were to remain on average at their current levels of approximately 10bt per year over the next 40 years until reaching China’s goal of “carbon neutrality” by 2060, China’s total emissions would still account for less than half of the global carbon budget. It is therefore highly unlikely that any 7 one of the leading states meets the threshold of CO2 emissions that would constitute an absolute existential threat capability, since no single state realistically accounts for the entire global carbon budget.

## Case

### Toplevel

1. Their scenarios are entirely about miscalc, to the extent the plan doesn’t decrease satellite constellations in space—it decks their solvency more than ours because the disad is about perceptions.
2. Military satellites are in geo orbit, not LEO. Means their timeframe is way longer because they have to wait until satellites are actually filling the entirety of LEO
3. Timeframe comes before probability—intervening alt causes and regulation are very likely in the space context because it is so new

### AT Collision

1. Their case has a bunch of alt causes- the Mecklin ev isolates space debris and Russian ASAT tests

#### Partnerships between governments and private industry solves debris and only getting better --- major strides by 2024- THEIR OWN EVIDENCE

**Pultarova 21**

[Tereza Pultarova, 05-26-2021, "Commercial space clean-up service could be ready in 2024," Space, ereza is a London-based science and technology journalist, aspiring fiction writer and amateur gymnast. Originally from Prague, the Czech Republic, she spent the first seven years of her career working as a reporter, script-writer and presenter for various TV programmes of the Czech Public Service Television. She later took a career break to pursue further education and added a Master's in Science from the International Space University, France, to her Bachelor's in Journalism and Master's in Cultural Anthropology from Prague's Charles University. She worked as a reporter at the Engineering and Technology magazine, freelanced for a range of publications including Live Science, Space.com, Professional Engineering, Via Satellite and Space News and served as a maternity cover science editor at the European Space Agency. [https://www.space.com/commercial-space-debris-removal-2024-astroscale]//DebateDrillsWW](https://www.space.com/commercial-space-debris-removal-2024-astroscale%5d/DebateDrillsWW)

"This **partnership with OneWeb** demonstrates their commitment to space sustainability and is the next step towards maturing our technologies **to develop** a full-service **debris removal** offering **by 2024**," John Auburn, managing director of Astroscale U.K. and group chief commercial officer [said in a statement](https://astroscale.com/astroscale-uk-signs-2-5-million-agreement-to-develop-space-debris-removal-technology-innovations-with-oneweb/). The new service **targets constellation operators** and is called ELSA-M. **The program would enable the removal of** multiple **retired satellites in** a **single mission**, thus **reducing cost** for the client, the company said in the statement. **The** orbital junk **collector would push each satellite into the atmosphere to burn up**, then return for the next defunct piece. "This funding **will help us evolve** key rendezvous and proximity operations technologies and capabilities beyond ELSA-d towards an end-of-life servicing offering for a range of constellation customers," Jason Forshaw, Astroscale's head of future business, Europe, said in the statement. "In parallel to this project, we're developing our next generation docking plate (DP), which is fitted to clients before launch, and is designed to enable a servicer to grapple the client. We are encouraging constellation customers to fit DPs to future-proof their satellites in case of need for removal due to failure, or at end of life, or to provide future in-orbit servicing." Astroscale's ELSA-d demonstration mission, currently in low Earth orbit, will carry out a series of rendezvous and close proximity debris capture and release manoeuvres this summer. The results of the test campaign will inform further work on the ELSA-M program, Astroscale said. The funding is part of the European Space Agency's (ESA) program called Sunrise, developing [flexible reprogrammable communication satellites.](https://www.gov.uk/government/news/uk-companies-join-forces-to-build-revolutionary-beam-hopping-satellite)

### A2 Space Wars

#### 1] Space Wars are not that dangerous—they’ll be robotized and end as soon as communication satellites are taken out. Corporations are specifically key to this peaceful outcome

--space wars have no terrorist groups or failed states

--mostly robotized means few lives lost

--brief because destroying communication satellites ends conflict, also incentivizes states to innovate in a way that reduces casualties

Szoic et al 17-- Szocik, Konrad [Department of Philosophy and Cognitive Science, University of Information Technology and Management in Rzeszow], Tomasz Wójtowicz [Institute of Security and Civic Education, Pedagogical University in Cracow, Podchorążych 2 Street, 30-084 Kraków, Poland], and Leszek Baran [Chair of Internal Security, University of Information Technology and Management in Rzeszow, Poland]. "War or peace? The possible scenarios of colonising Mars." Space Policy 42 (2017): 31-36. <https://doi.org/10.1016/j.spacepol.2017.10.002>. (AG DebateDrills)

Contrary to fourth and fifth generation warfare, space wars will be dominated by nation states and international corporations. Elon Musk, Managing Director of SpaceX, a company dealing with the manufacture of jet engines, carrier rockets, and spaceships, claimed that within the nearest 40–100 years over 1 million people might be sent to Mars. He estimated the cost of one person's reaching the Red Planet at USD 200 million [16]. According to the authors of the Mars one initiative, a sum of USD 6 billion will be needed to send the first four astronauts to Mars [6]. The need to secure such exorbitant funds virtually excludes any entities other than states and international corporations (terrorist groups, criminal organisations or failed states) from participating in space wars. It should be expected that the future space wars will entail an advanced process of conflict robotisation and dehumanisation. The prospective Mars colonisation war may proceed by means of robots – unmanned aerial vehicles. Ender's Game, an American science fiction film dating back to 2013, based on a novel by Orson Scott Card pub- lished under the same title, features scenes presenting such kind of a conflict. The film is set in 2070. The main hero, ten-year-old Andrew Wiggin, is elected leader of the invading fleet, intended to destroy the native world of a foreign life form threatening the Earth. Andrew Wiggin, believing that he is taking part in training, leads the invading fleet and defeats the enemy. The invading forces comprise only un- manned space drones controlled from a secure place [11]. The pro- gressing robotisation and dehumanisation of war will also be influenced by the strategic culture of western countries (the United States) whose societies show limited tolerance to human loss during military conflicts. As stressed by Adrian Lewis in his book The American Culture of War, abolishing the obligatory military service was the most significant change introduced in the 20th century to the U.S. war-fighting model. It triggered the professionalization of armed forces, with a mass army being replaced by mobile troops limited in numbers [14]. Along with the robotisation and dehumanisation, the future space wars should also be expected to be brief. Unless the dispute escalating between the global powers evolves into military activities located in the Earth, the conflict may end soon after the communication satellites of one of the parties are destroyed, or its space station is damaged. Considering the above, the technological arms race between the competing States, aimed at designing, as fast as possible, a weapon which will enable defeating the enemy in the first attack, without any possibility of re- taliation, will prove crucial.

#### 2] Attacks don’t escalate

--no retaliation – nukes are categorically different than space bc existential

--space is like cyber – attacks are unfortunate but not worthy of a nuke response

--nuke threats not credible bc nobody thinks space is at that lvl

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James A. Lewis, “Reconsidering Deterrence for Space and Cyberspace,” in Anti-satellite Weapons, Deterrence and Sino-American Space Relations, September 2013. <https://apps.dtic.mil/dtic/tr/fulltext/u2/a587431.pdf>

Unlike other military technologies, nuclear weapons pose an existential threat. If used, damage and casualties would be massive. In contrast, neither cyberattacks nor ASAT attacks pose the same level of destructiveness; they certainly are not existential threats. If there was some way credibly to threaten the use of nuclear weapons after a cyberattack, deterrence might be possible. However, a nuclear threat in response to these attacks would not be proportional and the threat to use nuclear weapons is likely to be discounted by opponents. There are powerful norms that constrain the use of these weapons, and therefore, a threat to use nuclear weapons in response to cyberattacks would be dramatic but not credible. Calls for a nuclear response to cyberattacks would be dismissed as frivolous. Threats to use military force to retaliate against an act that would not be considered as justifying the use of force in self-defense under international law or practice will likely be dismissed by opponents as bluster.