## US PIC

#### CP Text: The appropriation of outer space through asteroid mining by private entities should be banned by all states except for the United States of America.

#### Chinese investments are catching up and the US needs private companies to maintain space dominance – Chinese space dominance risks extinction. Autry and Kwast 19:

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The current U.S. space defense strategy is inadequate and on a path to failure. President Donald Trump’s vision for a Space Force is big enough. As he said on [June 18](https://www.whitehouse.gov/briefings-statements/remarks-president-trump-meeting-national-space-council-signing-space-policy-directive-3/), “It is not enough to merely have an American presence in space. We must have American dominance in space.” But the Air Force is not matching this vision. Instead, the leadership is currently focused on incremental improvements to existing equipment and organizational structures. Dominating the vast and dynamic environment of space will require revolutionary capabilities and resources far deeper than traditional Department of Defense thinking can fund, manage, or even conceive of. Success depends on a much more active partnership with the commercial space industry— and its disruptive capabilities. U.S. military space planners are preparing to repeat a conflict they imagined back in the 1980s, which never actually occurred, against a vanished Soviet empire. Meanwhile, China is executing a winning strategy in the world of today. It is burning hard toward domination of the future space markets that will define the next century. They are planning infrastructure in space that will control 21st-century telecommunications, energy, transportation, and manufacturing. In doing so, they will acquire trillion-dollar revenues as well as the deep capabilities that come from continuous operational experience in space. This will deliver space dominance and global hegemony to China’s authoritarian rulers. Despite the fact that many in the policy and intelligence communities understand exactly what China is doing and have been trying to alert leadership, Air Force leadership has convinced the White House to fund only a slightly better satellite command with the same leadership, while sticking a new label onto their outmoded thinking. A U.S. Space Force or Corps with a satellite command will never fulfill Trump’s call to dominate space. Air Force leadership is demonstrating the same hubris that Gen. George Custer used in convincing Congress, over President Ulysses S. Grant’s better experience intuition, that he could overtake the Black Hills with repeating rifles and artillery. That strategy of technological overconfidence inflamed conflict rather than subduing it, and the 7th Cavalry were wiped out at the Battle of the Little Bighorn. The West was actually won by the settlers, ranchers, miners, and railroad barons who were able to convert the wealth of the territory itself into the means of holding it. They laid the groundwork that made the 20th century the American Century and delivered freedom to millions of people in Europe and Asia. Of course, they also trampled the indigenous people of the American West in their wake—but empty space comes with no such bloody cost. The very emptiness and wealth of this new, if not quite final, frontier, however, means that competition for resources and strategic locations in cislunar space (between the Earth and moon) will be intense over the next two decades. The outcome of this competition will determine the fate of humanity in the next century. China’s impending dominance will neutralize U.S. geopolitical power by allowing Beijing to control global information flows from the high ground of space. Im

agine a school in Bolivia or a farmer in Kenya choosing between paying for a U.S. satellite internet or image provider or receiving those services for free as a “gift of the Chinese people.” It will be of little concern to global consumers that the news they receive is slanted or that searches for “free speech” link to articles about corruption in Western democracies. Nor will they care if concentration camps in Tibet and the Uighur areas of western China are obscured, or if U.S. military action is presented as tyranny and Chinese expansion is described as peacekeeping or liberation. China’s aggressive investment in space solar power will allow it to provide cheap, clean power to the world, displacing U.S. energy firms while placing a second yoke around the developing world. Significantly, such orbital power stations have dual use potential and, if properly designed, could serve as powerful offensive weapons platforms. China’s first step in this process is to conquer the growing small space launch market. Beijing is providing nominally commercial firms with government-manufactured, mobile intercontinental ballistic missiles they can use to dump launch services on the market below cost. These start-ups are already [undercutting](https://foreignpolicy.com/2019/04/02/beijing-is-taking-the-final-frontier-space-china/) U.S. pricing by 80 percent. Based on its previous success in using dumping to take out U.S. developed industries such as solar power modules and drones, China will quickly move upstream to attack the leading U.S. launch providers and secure a global commercial monopoly. Owning the launch market will give them an unsurmountable advantage against U.S. competitors in satellite internet, imaging, and power. The United States can still build a strategy to win. At this moment, it holds the competitive advantage in every critical space technology and has the finest set of commercial space firms in the world. It has pockets of innovative military thinkers within groups like the [Defense Innovation Unit](https://www.diu.mil/news-events), under Mike Griffin, the Pentagon’s top research and development official. If the United States simply protects the intellectual property its creative minds unleash and defend its truly free markets from strategic mercantilist attack, it will not lose this new space race. The United States has done this before. It beat Germany to the nuclear bomb, it beat the Soviet Union to the nuclear triad, and it won the first space race. None of those victories was achieved by embracing the existing bureaucracy. Each of them depended on the president of the day following the only proven path to victory in a technological domain: establish a small team with a positively disruptive mindset and empower that team to investigate a wide range of new concepts, work with emerging technologies, and test innovative strategies. Today that means giving a dedicated Space Force the freedom to easily partner with commercial firms and leverage the private capital in building sustainable infrastructure that actually reduces the likelihood of conflict while securing a better economic future for the nation and the world.

## Japan NB

#### The plan is a space shock that causes Asian arms races

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

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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.

## Trust CP

#### **TEXT: The Outer Space Treaty ought to be amended to establish an international legal trust system governing outer space.**

Fino 21 [Ivan Fino (Department of Law University of Turin), “Building a New Legal Model for Settlements on Mars,” A. Froehlich (ed.), Assessing a Mars Agreement Including Human Settlements, Studies in Space Policy 30, 2021. <https://doi.org/10.1007/978-3-030-65013-1_7>]CT

7.5 A Proposal for an International Legal Trust System Since several legal and policy issues may arise from the actual legal framework, a new international legal regime for outer space shall: (a) Provide for property rights or a lease allocation system, both incentivising investments in the space sector. The system would be supervised and led by the United Nations (UN) through the United Nations Office for Outer Space Affairs (UNOOSA). (b) Establish the rule of law in outer space. A laissez faire system could turn into anarchy whereby countries and companies could race to grab as many resources as possible bringing considerable potential conflict. (c) Recognise outer space as common heritage of mankind, instead of res communis.24 (d) Provide a sustainable exploitation of celestial bodies, to avoid the uncontrolled production of space debris or to prevent the complete exhaustion of the celestial bodies’ masses or their natural orbits.25 The United Nations should manage the ordered and sustainable economic development in outer space for the present and future generations. (e) Prevent the militarisation of outer space and favours the international collaboration, which are the same aims of the Outer Space Treaty’ drafters. (f) Consider the weak points of the Moon Agreement which led to nations’ refusal to sign. Only a widely accepted agreement would have the power of law in the international context. The abovementioned requirements could be met by establishing an international Legal Trust System (ILTS). A trust is an arrangement that assigns assets to one or more trustees that will manage them in the interest of one or more beneficiaries. The latter may include the trustee or the settlor.26 Translated in the ILTS, mankind would assume the role of settlor and beneficiary of the outer space resources. The UNOOSA would act as main trustee of outer space resources and trading property rights and leases to companies and countries. The rights over the celestial bodies or over its resources would depend on the nature of the celestial body itself. For example, property rights are preferable to a lease over asteroids, as they could just disappear after the exploitation. Both leases and property rights can be provided over lands and mining sites on Mars. Leases or defeasible titles are preferable for some land mass on those celestial bodies which could hypothetically be used by humankind pending an Earth disaster. In the case of lucrative activities, such as mining, companies will choose whether to get the exclusive use over the resource through payment of the lease or through annual payment linked to net proceeds or to production charges. 7.6 The Functioning of the International Legal Trust System When a company is interested in leasing or buying an outer space resource, before starting any operations, it must send a plan of work to the United Nations. The plan of work shall include all the details of the activity that would be carried out; it shall be consistent with pre-established parameters of sustainability and shall not interfere with other space activities. If the UN approves the company plan of work, the country of the company assumes the role of co-trustee for the specific resource. Thus, as a cotrustee, countries must investigate whether all activities of their national companies are consistent with the plan of work authorised by the UN. These supervisory duties would be added to the responsibility of nations for all space objects that are launched within their territory.27 The UN, as main trustee, would oversee that countries are performing their duties. This model would be the ordinary one. There would be also an extraordinary model, in which the UN would be the only trustee. This model would be possible in two instances: when the country of the applicant for a private company is not technologically able to act as a trustee or when the applicant of the activity is a country itself. Furthermore, as stated previously, the beneficiaries of this trust are the countries of the world and their citizens; hence all mankind would take concrete profit from lease transactions and benefit sharing. The income from the sales, leases and benefit sharing can be distributed to mankind by financing international global goals, following a similar model of the 17 Sustainable Development Goals adopted by the United Nations in 2015, which addressed poverty, inequality, climate change, environmental degradation, and peace and justice. Finally, the International Legal Trust System would meet acceptance because every country would obtain benefit sharing to improve its living standard and space faring nations would rely on property rights.

#### **The legal trust would incentivize investment in space while preventing conflict and ensuring sustainable development and the equitable distributions of resources.**

Finoa ’20 – Ivan Finoa [Department of Law, University of Turin], “An international legal trust system to deal with the new space era,” 71st International Astronautical Congress (IAC) – The CyberSpace Edition, (12-14 October 2020). <<https://d1wqtxts1xzle7.cloudfront.net/66728932/_IAC_20_E7.VP.8.x58518_An_international_legal_trust_system_to_deal_with_the_new_space_era_BY_IVAN_FINO-with-cover-page-v2.pdf?Expires=1642044926&Signature=asvt6StaK5n9UnpXuJIlo4ziI839WzFYjDZy37bm70ObGy3vFJyHwWNGxhn2beze4QzYDPPX0pVEXAwYvDaINVNxN01Ify8YwG5loNRddlat-grf3iawic7KvwqPowxFe2GuemVvbB-KW8ZVBxigwS-gelSKIVy4KYR9UgiDrM6e6deEBnUTcULSwmsH-JdHNg13ytZ3vNVMMlxZW2MPOCRuB2WlOHdCLoC86VqafSoMwuec-d~Aisbgyt5F2vO-GjvI60bR7h2MSp0iT6P7apIDUUpHUsDGbvcdxp22HSxXdlvr7lSqtLnL5rKxujGDYq~R9B~WuGiorVL2hn74UQ__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA>>CT

Considering the worsening climate change, in the future outer space might be our last Noah’s Ark. Now, humans must look to space as an opportunity to support growing resource requirements. Asteroids are rich in metals, which could be transported back to Earth. Unfortunately, the existing international legal framework discourages investments in the space economy. Once an enterprise invests billions of dollars in discovering and developing a mining site, it cannot claim any ownership because of the non-appropriation principle stipulated in Article 2 of the Outer Space Treaty (OST). Thus, other entities could legally access and exploit the same resource without any participation in the initial financial investment, increasing the risk of potential conflict. Bearing this in mind, the question arises, which legal regime could ensure effective allocation of resources, avoiding a chaotic space race to acquire valuable assets? The aim of this research is to argue that the first two articles of OST should be amended, to set up an international legal trust system which would guarantee different kinds of rights, dependently on the nature of the celestial body. E.g., property rights could be preferable to a lease over asteroids,

as they could be exploited to their disappearance. This proposed system would be led by the United Nations Office for Outer Space Affairs (UNOOSA), as the main trustee. The co-trustees would be the nations of the world. Prior to initiating any space activity, every entity would send a request to their national government. If all the legal parameters are respected, the nation would forward the operational request to the UNOOSA. In the case of acceptance, UNOOSA would record the permit on an international public registry. The country in which the company has been registered would investigate whether the activities of its national company are consistent with the permit. This would be the ordinary model. The extraordinary model would be when the applicant for the space activity is a state, then the trustee would be the UN. All lucrative activities would be subject to benefit-sharing. Finally, this research will demonstrate the valuable outcome of the International Legal Trust System and its advantages for all humankind. Private companies would rely on property rights, while the benefit-sharing could be used to finance the 17 Sustainable Development Goals adopted by the UN in 2015, which address peace, climate change, inequalities and poverty.

## NC – Asteroid Mining + Spillover

#### Private Sector asteroid mining is the major profit motive for further space exploration

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Perhaps 10,000 asteroids the size of sports stadiums are on orbits that swing close to Earth. As the dinosaurs would attest, our planet occasionally gets hit. But the results aren’t always a bad thing: it’s looking likely that Earth’s oceans were filled by water brought by asteroids. Along with water, asteroids might even have brought the ingredients of life to Earth in the form of so-called ‘prebiotic’ molecules, including amino acids and, as recently found, components of proteins and sugars. Learning more about asteroids means learning more about our origins. What can we actually do with asteroids? That brings us to my favourite thing about them: their resources. Being an idealistic astrophysicist, my interest is in the money to be made from them. That really is idealistic because, if we can make a profit mining the asteroids, then doing bigger things in space will become a lot cheaper. Capitalism has its faults, but one thing it does well is to make things cheaper. I want to use it as a tool so that we can build far bigger telescopes than we could practically realise today. What do astronomers want? More light! Bigger telescopes! Asteroid mining could make that dream a reality. The siren call of asteroids for miners is that the Main Belt asteroids contain vast amounts of resources. The iron found in asteroids adds up to some 10 million times the iron that we have in proven reserves on Earth. That’s a lot. It’s enough to build many rings of iron girders all the way around Earth’s orbit, along the lines of the science fiction novel Ringworld (1970) by Larry Niven. Not that a ringworld is a sensible thing to make, but it is a really big ring. More plausibly, with that much iron we could build cities in space, as envisaged by the physicist Gerard K O’Neill in the 1970s. Each of these cities would be big enough for a million people to live in. They would be rotating cylinders, and as a citizen of one you would be walking around inside the cylinder’s surface, feeling a fake gravity from the centrifugal force. That’s the scale of resources we’re talking about. These vast material supplies could make for an era that people call ‘post-scarcity’, where there’s plenty for everyone, just as there is in the 23rd century of the Star Trek science fiction franchise. The starship crew on Star Trek don’t work to keep themselves fed and housed, that’s taken for granted. They work for adventure and exploration. Asteroid wealth could help all of us take a step towards that happy state. The problem is how to get started. Iron in space is not going to make for giant profits in the short run. On the ground, it sells for less than $200 a ton. It would be worth more in space, but unfortunately there’s no one to buy huge tonnages of iron in space. To adapt the tagline from the Alien movies – ‘In space, no one can hear you sell.’ It certainly isn’t worth bringing space iron back to Earth since the cost of doing so would far exceed the price it could command. Starting to mine space for resources will have to begin with something so valuable that the cost of obtaining it in space is small by comparison. For now, the best bets are precious metals and – surprise – water. Precious metals are obvious. Platinum sells for about $33.5 million a ton, and we know from meteorites that some asteroids are richer in platinum than any mine on Earth. That sounds promising. Platinum sales run at about 200 tons, or billions of dollars, per year. The bad news is that ‘richer than any mine on Earth’ is still concentrations of just tens of grams per ton, and extracting those precious grams isn’t easy. We can’t just bring an asteroid near to Earth to start extracting the platinum where we can have heavy machinery to work on it. That would take way too much fuel because, to carry more mass, rockets have to carry exponentially more fuel; unlike airplanes, they don’t get the oxygen for free from their surroundings, they have to pull it along with them. Any refining of platinum will have to be done robotically out in the native orbit of the asteroid. That’s quite a challenge. Water is a less obvious money-maker. The surprise is that water is also worth millions per ton – if it’s sold in space. Water in space is really useful. It’s good for drinking, and the oxygen in it is good for breathing. You can split the hydrogen from the oxygen in H2O and you’ve got rocket fuel, and water is good at absorbing radiation to protect people from cancer-causing cosmic rays. So, in principle, water in orbit is pretty valuable. The good news is that up to 10 per cent of a water-rich asteroid can be water. It won’t be simple ice, most likely, but will be bound into clays and other rocks. Even better, water is much easier to extract than precious metals. Simply heating up the rock will release water that can then be captured. How much is space water worth? Until recently, it cost $20 million to get a ton of water into even a low orbit – say, to the International Space Station (ISS). To get a ton of water to a high orbit, like the 24-hour orbit of TV transmitting satellites, would cost about three times as much. SpaceX has started to cut that cost; for now, it’s charging about $3 million a ton to a low orbit on a Falcon 9 rocket. Water from asteroids might be able to compete with those prices and still return a nice profit. But the bad news is that, right now, there’s no one in space who wants to buy water. At least not yet. That might be about to change. We won’t get to build cities in space unless we can build simpler space stations first, and do so at an affordable cost that can scale. If we have space stations, they will need supplies, especially of water and perhaps construction materials. That demand could create a business delivering these supplies from space instead of from Earth. In this case, the asteroids would have the most to offer. So space stations – particularly commercial space stations – are the key to acquiring asteroid resources. Why build space stations? There are three primary uses: research, manufacturing and tourism. Research has always been done on the ISS, but facilities and time have been in short supply. In recent years, the equipment has improved a lot, but astronaut time is still scarce. Each astronaut has to look after multiple experiments. Multitalented and smart as the astronauts all are, they simply can’t have all the experience of the scientists whose experiments they’re operating. A lot of effort goes into automating those experiments so that the astronauts aren’t overwhelmed. It would be far more efficient if the scientists who invent the experiments also get to be the ones who carry them out in space. Then their years of experience could be put to good use operating and watching over their studies. Spotting subtle anomalies that could be a sign of a failure, or of a discovery, is much better done in person by experts. But, until now, scientists didn’t have that opportunity, and they would have likely declined it if offered the chance. That’s because training for a mission to the ISS takes more than two years full-time and requires learning Russian. If you take two years off from doing your research, then you’re no longer at the forefront and you’ll have lost your edge. Few top scientists would risk that, however much fun it might be to float in space. We scientists live for our research. Fortunately, the new commercial stations will be much easier to train for, taking a couple of months or so, because they’ll have a single manufacturer with consistent, uniform interfaces, and a separate professional crew to deal with maintenance and emergencies. The companies with advanced plans so far are all US-based, so English will be the language used. As English is the lingua franca of science, it poses little challenge to scientists worldwide. The transport cost of bringing a new heart down to Earth is going to be far less than it’s worth to the recipient Manufacturing in space has always seemed like a fool’s errand. Whatever you make out there would have to be worth outrageous amounts to cover the shipping costs back to Earth. Now, though, those costs have come down almost 10-fold, with more reductions promised. As a result, a few items do pass that test. Already, there are first tests taking place on the ISS to see if the advantages of manufacturing in almost zero gravity (‘micro-gravity’) are really as great as some have suggested. The most popular idea is to make super-powerful optical fibres that could carry far more data traffic than current transoceanic fibres can. They could potentially do so more cheaply because they would be simpler: they wouldn’t need repeater stations. Certainly, the demand is there, since there’s no limit to the number of cat videos we must share. These ‘ZBLAN’ optical fibres showed dramatic improvements when small amounts were made during brief, half-minute long intervals of weightlessness on a parabolic flight. There are a few companies already trying to make ZBLAN fibres on the ISS. The results must be promising because they went back after their first attempt. A kilogram of fancy optical fibres already sells for about $1 million to $20 million. That will pay for the postage and still give you change! Another idea is to 3D-print human organs in space. Why? Printing ears on Earth has been done, using a scaffolding that later dissolves away. But some organs are trickier, and scaffolds don’t always work. Without that support, the layers of cells tend to slip and slide out of position, which is not the desired effect for something meant to keep you alive. In micro-gravity, the slipping and sliding should be much smaller. The goal is eventually to be able to print a human heart. A heart weighs less than a kilogram. Even with packaging to keep it healthy, the transport cost of bringing a new heart down to Earth is going to be far less than it’s worth to the recipient. Again, first experiments toward this goal are underway on the ISS. A finger splint produced by the ISS’s onboard 3D printer. Courtesy of NASA Tourism in space actually goes back quite a way. The first space tourist was Dennis Tito, a US engineer and entrepreneur, who spent a week or so on board the ISS 20 years ago, in 2001. His ride on a Russian Soyuz spaceship was arranged by Space Adventures Inc, a company set up to get private individuals into space. Since then, there have been six others who flew to space with Space Adventures, though their seats weren’t cheap: each ticket cost tens of millions of US dollars. That price limits the ridership pretty strongly. The hope is that the new spaceships will drop the price to something a little more reasonable, say the price of a nice house. At that price, people – still highly affluent – will start to fill up the commercial space stations. The first few might put up with arduous ways of conserving water that the astronauts on the ISS endure, but if one enterprising space station offers showers and a good toilet, they’ll be able to charge a premium. That in turn will produce a demand for a lot more water, where asteroids might come in handy. And there could be unexpected and subtler benefits of space tourism. More people will experience the ‘overview effect’, in which seeing our planet as one borderless, delicate biosphere increases awareness of the fragility and beauty of life. As many of these space tourists will be wealthy, perhaps a shift in their perspective will have outsized influence. Axiom Space has had the interiors of their space station curated by the luxury designer Philippe Starck Space stations have always been extremely expensive items that only governments could afford. The ISS is the leading example. It has been called the most expensive building project ever, at about $100 billion. There are now at least four companies trying to make space stations cheaper with the idea of operating them commercially. COVID-19 shut down one of these ventures, Bigelow Aerospace, but the Sierra Nevada Corporation is a new entrant to the space station game. In addition, there’s United Launch Alliance and, the present leader of the pack, Axiom Space. Axiom Space will start off attaching the first part of its space station to the ISS in late 2024. Over several years, it will add more pieces until it has enough to stand alone, then it will detach itself and fly as an independent, Axiom-owned space station. In recognition that some of their clientele will be used to five-star hotels, Axiom Space has had the interiors of their space station curated by the luxury designer Philippe Starck. Axiom plans to cut the cost of their station at least 10-fold compared with the ISS. There are many countries that want a human space programme but couldn’t previously afford it. Soon they can. Axiom says that they already have more than 20 countries signed up. All three of these new for-profit uses for space – research, manufacturing and tourism – will lead to a demand for more material in space. Water is needed for all of them, as well as a lot of construction materials. Will all that material come from Earth? Or will our growing capabilities in space mean that it becomes cheaper to bring some of it from the asteroids? Getting resources from space profitably is not a slam dunk. The physics makes sense – the energy needed is far less than to bring them up from Earth – but the economics aren’t obvious. Getting entrepreneurs and venture capitalists interested in a new enterprise always depends on increasing the reward and diminishing the risk until they reach a threshold where it’s worth taking the leap. Then again, they can’t wait too long or someone else will beat them to it. Historically, governments have done the high-risk, long-term investment needed to seed new markets. And they’re doing so today for space resources. It seems a safe bet that a decade from now there will be a bunch of commercial space stations orbiting Earth, and that they will house a growing number of people working and vacationing in space. For many, this will constitute our first step in creating a beyond-Earth society.

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

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

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

#### Continued private space development is the only way to make sustainable energy feasible – empirics prove. Autry 19:

Greg Autry {the director of the Southern California Commercial Spaceflight Initiative at the University of Southern California, vice president at the National Space Society, and chair of the International Space Development Conference, }, 19 - ("Space Research Can Save the Planet—Again," Foreign Policy, 7-20-2019, <https://foreignpolicy.com/2019/07/20/space-research-can-save-the-planet-again-climate-change-environment/)//marlborough-wr/>

Today conservationists and other critics are more likely to see space programs as militaristic splurges that squander billions of dollars better applied to solving problems on Earth. These well-meaning complaints are misguided, however. Earth’s problems—most urgently, climate change—can be solved only from space. That’s where the tools and data already being used to tackle these issues were forged and where the solutions of the future will be too. Space research has already been critical in averting one major environmental disaster. It was NASA satellite data that revealed a frightening and growing hole in the ozone layer over the South Pole, galvanizing public concern that, in 1987, produced the Montreal Protocol: the first international agreement addressing a global environmental problem. Since then, thanks to worldwide restrictions on damaging chlorofluorocarbons, the ozone situation has stabilized, and a full planetary recovery is expected. As this case showed, space can provide the vital information needed to understand a problem—and a surprising range of ways to solve it. Climate change is a poster child for the critical role of space data.

Trekking across the globe to measure ice sheets with drills and gauge sea temperatures from the sides of ships is an expensive, slow, and insufficient way to assay the state of the planet. Satellites operated by NASA, the U.S. National Oceanic and Atmospheric Administration, and an increasing number of commercial firms provide a plethora of multispectral imaging and radar measurements of developments such as coral reef degradation, harmful plankton blooms, and polar bears negotiating thinning ice. Much of the technology involved in observing the Earth today was initially developed for probes sent to explore other planets in our solar system. Indeed, understanding the evolution of other planets’ climates is essential for modeling possible outcomes on Earth. NASA probes revealed how, roughly 4 billion years ago, a runaway greenhouse gas syndrome turned Venus into a hot, hellish, and uninhabitable planet of acid rain. Orbiters, landers, and rovers continue to unravel the processes that transformed a once warm and wet Mars into a frigid, dry dust ball—and scientists even to conceive of future scenarios that might terraform it back into a livable planet. Discovering other worlds’ history and imagining their future offers important visions for climate change mitigation strategies on Earth, such as mining helium from the moon itself for future clean energy. Spinoff technologies from space research, from GPS to semiconductor solar cells, are already helping to reduce emissions; the efficiency gains of GPS-guided navigation shrink fuel expenditures on sea, land, and air by between 15 and 21 percent—a greater reduction than better engines or fuel changes have so far provided. Modern solar photovoltaic power also owes its existence to space. The first real customer for solar energy was the U.S. space program; applications such as the giant solar wings that power the International Space Station have continually driven improvements in solar cell performance, and NASA first demonstrated the value of the sun for powering communities on Earth by using solar in its own facilities. Promisingly, space-based solar power stations could overcome the inconvenient truth that wind and solar will never get us anywhere near zero emissions because their output is inherently intermittent and there is, so far, no environmentally acceptable way to store their power at a global scale, even for one night. Orbital solar power stations, on the other hand, would continually face the sun, beaming clean power back through targeted radiation to Earth day or night, regardless of weather. They would also be free from clouds and atmospheric interference and therefore operate with many times the efficiency of current solar technology. Moving solar power generation away from Earth—already possible but held back by the current steep costs of lifting the materials into space—would preserve land and cultural resources from the blight of huge panel farms and save landfills from the growing problem of discarded old solar panels. Sustainable energy advocates in the U.S. military and the Chinese government are actively pursuing space-based solar power, but just making solar cells damages the environment due to the caustic chemicals employed. Space technology offers the possibility of freeing the Earth’s fragile biosphere and culturally important sites from the otherwise unavoidable damage caused by manufacturing and mining. The U.S. start-up Made in Space is currently taking the first steps toward manufacturing in orbit. The company’s fiber-optic cable, produced by machinery on the International Space Station, is orders of magnitude more efficient than anything made on Earth, where the heavy gravity creates tiny flaws in the material. Made in Space and others are eventually planning to build large structures, such as solar power stations, in space. As these technologies develop, they will augment each other, bringing costs down dramatically; space manufacturing, for instance, slashes the cost of solar installations in space. Eventually, firms will be able to supply endeavors in space with materials from the moon and asteroids, avoiding the cost and environmental impact of lifting them into orbit. Mining the solar system comes with its own potential impacts, but extracting resources from distant and lifeless worlds is clearly preferable to the continued degradation of the Earth.

#### Warming causes extinction – outweighs all aff impacts

Miller-McDonald, 18 – (Samuel, Master of Environmental Management at Yale University studying energy politics and grassroots innovations in the US. 5-2-2018. "Extinction vs. Collapse." Resilience. https://www.resilience.org/stories/2018-05-02/extinction-vs-collapse/)

Climate twitter – the most fun twitter – has recently been reigniting the debate between human extinction and mere civilizational collapse, between doom and gloom, despair and (kind of) hope. It was sparked by an interview in The Guardian with acclaimed scientist Mayer Hillman. He argues that we’re probably doomed, and confronting the likelihood that we’re rushing toward collective death may be necessary to save us. The headline alone provoked a lot of reactions, many angered by the ostensible defeatism embedded in Hillman’s comments. His stated view represents one defined camp that is mostly convinced of looming human extinction. It stands in contrast to another group that believes human extinction is highly unlikely, maybe impossible, and certainly will not occur due to climate change in our lifetimes. Collapse maybe, but not extinction. Who’s more right? Let’s take a closer look. First, the question of human extinction is totally bounded by uncertainty. There’s uncertainty in climate data, uncertainty in models and projections, and even more uncertainty in the behavior of human systems. We don’t know how we’ll respond to the myriad impacts climate change is beginning to spark, and we don’t know how sensitive industrial civilization will be to those impacts. We don’t really know if humans are like other apex predators highly sensitive to ecological collapse, or are among the most adaptable mammals to ever walk the earth. One may be inclined to lean toward the latter given that humans have colonized every ecological niche on the planet except Antarctica. That bands of people can survive in and around deserts as well as the Arctic as well as equatorial rainforests speaks to the resilience of small social groups. It’s why The Road is so disturbingly plausible; there could be a scenario in which basically everything is dead but people, lingering in the last grey waste of the world. On the other hand, we’ve never lived outside of the very favorable conditions of the Holocene, and past civilizational and population collapses suggest humans are in fact quite sensitive to climatic shifts. Famed climate scientist James Hansen has discussed the possibility of “Venus syndrome,” for instance, which sits at the far end of worst case scenarios. While a frightening thought experiment, it is easily dismissed as it’s based on so many uncertainties and doesn’t carry the weight of anything near consensus. What’s more frightening than potentially implausible uncertainties are the currently existing certainties. For example: Ecology + The atmosphere has proven more sensitive to GHG emissions than predicted by mainstream science, and we have a high chance of hitting 2oC of warming this century. Could hit 1.5C in the 2020s. Worst-case warming scenarios are probably the most likely. + Massive marine death is happening far faster than anyone predicted and we could be on the edge of an anoxic event. + Ice melt is happening far faster than mainstream predictions. Greenland’s ice sheet is threatening to collapse and already slowing ocean currents, which too could collapse. + Which also means predictions of sea level rise have doubled for this century. + Industrial agriculture is driving massive habitat loss and extinction. The insect collapse – population declines of 75% to 80% have been seen in some areas – is something no one predicted would happen so fast, and portends an ecological sensitivity beyond our fears. This is causing an unexpected and unprecedented bird collapse (1/8 of bird species are threatened) in Europe. + Forests, vital carbon sinks, are proving sensitive to climate impacts. + We’re living in the 6th mass extinction event, losing potentially dozens of species per day. We don’t know how this will impact us and our ability to feed ourselves. Energy + Energy transition is essential to mitigating 1.5+C warming. Energy is the single greatest contributor to anthro-GHG. And, by some estimates, transition is happening 400 years too slowly to avoid catastrophic warming. + Incumbent energy industries (that is, oil & gas) dominate governments all over the world. We live in an oil oligarchy – a petrostate, but for the globe. Every facet of the global economy is dependent on fossil fuels, and every sector – from construction to supply chains to transport to electricity to extraction to agriculture and on and on – is built around FF consumption. There’s good reason to believe FF will remain subsidized by governments beholden to their interests even if they become less economically viable than renewables, and so will maintain their dominance. + We are living in history’s largest oil & gas boom. + Kilocalorie to kilocalorie, FF is extremely dense and extremely cheap. Despite reports about solar getting cheaper than FF in some places, non-hydro/-carbon renewables are still a tiny minority (~2%) of global energy consumption and will simply always, by their nature, be less dense kcal to kcal than FF, and so will always be calorically more expensive. + Energy demand probably has to decrease globally to avoid 1.5C, and it’s projected to dramatically increase. Getting people to consume less is practically impossible, and efficiency measures have almost always resulted in increased consumption. + We’re still setting FF emissions records. Politics + Conditions today resemble those prior to the 20th century’s world wars: extreme wealth inequality, rampant economic insecurity, growing fascist parties/sentiment, and precarious geopolitical relations, and the Thucydides trap suggests war between Western hegemons and a rising China could be likely. These two factors could disrupt any kind of global cooperation on decarbonization and, to the contrary, will probably mean increased emissions (the US military is one of the world’s single largest consumers/emitters of FF). + Neoliberal ideology is so thoroughly embedded in our academic, political, and cultural institutions, and so endemic to discourse today, that the idea of degrowth – probably necessary to avoid collapse – and solidarity economics isn’t even close to discussion, much less realization, and, for self-evident reasons, probably never will be. + Living in a neoliberal culture also means we’ve all been trained not to sacrifice for the common good. But solving climate change, like paying more to achieve energy transition or voluntarily consuming less, will all entail sacrificing for the greater good. Humans sometimes are great at that; but the market fundamentalist ideology that pervades all social, commercial, and even self relations today stands against acting for the common good or in collective action. + There’s basically no government in the world today taking climate change seriously. There are many governments posturing and pretending to take it seriously, but none have substantially committed to a full decarbonization of their economies. (Iceland may be an exception, but Iceland is about 24 times smaller than NYC, so…) + Twenty-five years of governments knowing about climate change has resulted in essentially nothing being done about it, no emissions reductions, no substantive moves to decarbonize the economy. Politics have proven too strong for common sense, and there’s no good reason to suspect this will change anytime soon. + Wealth inequality is embedded in our economy so thoroughly – and so indigenously to FF economies – that it will probably continue either causing perpetual strife, as it has so far, or eventually cement a permanent underclass ruled by a small elite, similar to agrarian serfdom. There is a prominent view in left politics that greater wealth equality, some kind of ecosocialism, is a necessary ingredient in averting the kind of ecological collapse the economy is currently driving, given that global FF capitalism by its nature consumes beyond carrying capacities. At least according to one Nasa-funded study, the combination of inequality and ecological collapse is a likely cause for civilizational collapse. Even with this perfect storm of issues, it’s impossible to know how likely extinction is, and it’s impossible to judge how likely or extensive civilizational collapse may be. We just can’t predict how human beings and human systems will respond to the shocks that are already underway. We can make some good guesses based on history, but they’re no more than guesses. Maybe there’s a miracle energy source lurking in a hangar somewhere waiting to accelerate non-carbon transition. Maybe there’s a swelling political movement brewing under the surface that will soon build a more just, ecologically sane order into the world. Community energy programs are one reason to retain a shred of optimism; but also they’re still a tiny fraction of energy production and they are not growing fast, but they could accelerate any

moment. We just don’t know how fast energy transition can happen, and we just don’t know how fast the world could descend into climate-driven chaos – either by human strife or physical storms. What we do know is that, given everything above, we are living through a confluence of events that will shake the foundations of civilization, and jeopardize our capacity to sustain large populations of humans. There is enough certainty around these issues to justify being existentially alarmed. At this point, whether we go extinct or all but a thousand of us go extinct (again), maybe that shouldn’t make much difference. Maybe the destruction of a few billion or 5 billion people is morally equivalent to the destruction of all 7 billion of us, and so should provoke equal degrees of urgency. Maybe this debate about whether we’ll go completely extinct rather than just mostly extinct is absurd. Or maybe not. I don’t know. What I do know is that, regardless of the answer, there’s no excuse to stop fighting for a world that sustains life.

# CASE

### General

#### Future space faring nations will not be included in the plan which means they won’t solve

#### The Scoles is the ONLY card that says that mining takes out satellites, and it says that companies are already taking risk into account

#### This is the Scoles card later in the article.

Sarah Scoles 15, “Dust from asteroid mining spells danger for satellites,” New Scientist, 5-27-2015, https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/

Handmer and Roa want to point out the problem now so that we can find a solution before any satellites get dinged. “It is possible to quantify and manage the risk,” says Handmer. “A few basic precautions will prevent harm due to stray asteroid material.” Mike Nolan of the Arecibo Observatory in Puerto Rico agrees it’s an important issue. “They’re right to consider it,” he says, “and their first stab indicates that the answer isn’t obviously ‘don’t worry’.” However, the risk is less concerning for asteroids not in this particular lunar orbit, he says. Aspiring space miners are taking the risk seriously. “We will be utilising containment techniques,” says Meagan Crawford of Deep Space Industries, a California-based firm which hopes to be mining metals from asteroids by 2020. One possibility is bagging, in which the asteroid is placed in a kind of shroud to prevent dust and loose stones from escaping. “All of our mining targets will be chosen specifically to minimise the risk of particulate interaction with other bodies,” she says. The risk from NASA’s mission, planned for the 2020s, is small, Nolan points out. But if space mining takes off, things will get complicated. “The establishment of good asteroid mining practices early on is essential for the preservation of a non-renewable resource: uncluttered space,” says Handmer.

#### The card assumes private entities MOVING asteroids closer to Earth, which they can’t yet do

Dominic **Basulto, 13** - ("Can NASA really lasso an asteroid?," Washington Post, 6-5-2013, 12-18-2021https://www.washingtonpost.com/news/innovations/wp/2013/06/05/can-nasa-really-lasso-an-asteroid/)//AW

To make all this work, however, will require a number of technologies that are just now in their infancy. For example, the Jet Propulsion Laboratory (JPL) in California and the Glenn Research Center in Ohio are both working on a sci-fi sounding “ion propulsion engine” that depends on a non-traditional fuel source to propel the spacecraft through deep space at unfathomable speeds. If the former Space Shuttle topped out at 18,000 mph, the new ion propulsion engine would enable a futuristic robotic spacecraft to travel at speeds of close to 200,000 mph. (By way of comparison, the speed of light is 186,000 miles per second). Then, of course, there’s the matter of the lasso itself that’s capable of pulling a 2-mile wide piece of rock millions of miles in outer space, while being bombarded by cosmic radiation. When you’re flying at 200,000 mph, do you just have a robot throw a piece of rope out the window to lasso an asteroid the way a Texas cowboy might lasso a bucking bronco?

#### Asteroids are so far from Earth that chunks will never collide

#### Space lassoing would solve space debris.

Kastalia **Medrano, 16** - ("Japan Wants to Solve Space Junk by Lassoing it Out of Earth's Orbit," Inverse, 12-19-2016, 12-18-2021https://www.inverse.com/article/25396-japan-jaxa-space-junk-tether-lasso-kite)//AW

The Japanese Aerospace Exploration Agency (JAXA) has a neat idea for how to tackle the increasingly worrisome problem of space junk — deploying small spacecraft to literally tether chunks of debris and drag them down to a lower orbit, where both the debris and the craft that wrangled them will subsequently burn up in the atmosphere. Last week, a prototype system called the Kounotori Integrated Tether Experiments (KITE) was delivered to the International Space Station, which JAXA will soon begin testing. The technology could potentially be implemented within a decade. JAXA first proposed this idea in 2014. A half-mile long electrodynamic tether (EDT) will target the larger pieces of debris we’re aware of, in the 400-4,000 pound range, according to Space.com. Fortunately for us all, JAXA recently released an animated video of what this is expected to look like.

#### Circumvention- their plan isn’t specific enough to detail what regulations will solve. If they articulate it as a ban or say perm do the cp bc the aff if a tax, you should vote them down because it makes the aff a moving target bc we don’t know what their actually defending in the ac.

#### Their solvency advocate is for global space commons which their plan doesn’t do. China already recognizes space as a commons so nonunique.

#### Private entity liability solves- they won’t do anything that risks private property because they’ll be sued.

#### Government sector will inevitably militarize space

**Shamas & Holden, 2019**, Victor Shamas &, Oslo Metropolitan University, Work Research Institute (AFI), Oslo, Norway; Thomas Holden, Independent scholar, Oslo, Norway, 2019, Palgrave Communications, One giant leap for capitalistkind: private enterprise in outer space, https://www.nature.com/articles/s41599-019-0218-9

On the other hand**, outer space still remains firmly within the domain of the state and is likely to do so for the foreseeable future, with the likely continued importance of military uses of satellite technology and the weaponization of Earth’s orbit**—crucially, the Outer Space Treaty only prohibits nuclear arms and other ‘weapons of mass destruction' in space, not conventional weapons, such as ballistic missiles.

### General

1. **Space cooperation doesn’t lead to broader relations.**