# 1AC

## 1AC — Plan

#### Plan: The appropriation of outer space through asteroid mining by private entities should be banned.

#### We’ll defend normal means as the signatories of the OST adding an optional protocol under Article II.

#### Multiple ambiguities mean that current interpretation of the OST doesn’t restrict private entities AND that other countries are just redefining it

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While the Treaty makes it clear that there is a right of free access to celestial bodies for all nations, it prohibits ownership of the bodies themselves. It also qualifies that space activities by private entities must be authorised and supervised by the appropriate nation. However, the Treaty does not deal clearly with whether space resource extrac- tion is a lawful enterprise under its terms. Discussed below are several ambiguities of import in assessing the legality of space mining.

First, what is meant by ‘celestial bodies’? Because there is no single governing defi- nition of celestial bodies, it is unclear whether the category includes asteroids.92 If aster- oids are not celestial bodies, then the Outer Space Treaty’s prohibition on national appropriation of the moon and other celestial bodies would not apply to them. However, most legal scholars agree that asteroids should be encompassed within the treaty terms.93 The International Astronomical Union likewise includes asteroids in its definition of celestial bodies.94 Thus, it is safe to assume that the Treaty applies to asteroids and the remaining discussion in this overview proceeds accordingly.

Second, what is the effect of the Treaty’s statement that the exploration and use of space ‘shall be carried out for the benefit and in the interests of all countries’? While some have argued that this clause mandates an international profit-sharing mechanism, the US and others have taken the position that it merely reiterates the right of free access articulated in Article I.95

Third, does the prohibition on national appropriation extend to a grant of private rights over extracted resources? Meaning, can private entities own resources extracted from the celestial body without any nation owning the body itself? The Treaty includes the phrase ‘exploration and use’ twice in its terms. The word ‘use’ seems to indicate that leveraging space resources was within the contemplation of the drafters, and thus, not prohibited.96 Still, it is unclear how rights would be distributed where national appro- priation is prohibited. The diplomatic history of the Treaty indicates that perhaps this point was left ambiguous deliberately in order to gain support across nations.97

The closest analogue to a legal framework of this type is the extraction and utilisation of resources, such as fish, from the high seas. While the high seas are outside the jurisdic- tion of any single nation, domestic laws protect property rights over resources extracted from them.98 As discussed in greater depth below, US domestic law asserts that the same framework applies to the moon and asteroids. Proponents of this line of thinking argue that granting private property rights to asteroid resources does not conflict with the inter- national prohibition on national appropriation of asteroid bodies.99

#### Specifically, countries have demonstrated a vested interest for their private sector to appropriate

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As commercial business plans for space resources progress, spacefaring countries are using policy and financial tools to competitively position their emerging space industry sectors for growth. Space resources first emerged as a commercial opportunity of target by start-ups based in the United States. Accordingly, the United States was at the forefront of initial policy developments to support this nascent commercial activity. In 2015, Congress passed the US Commercial Space Launch Competitiveness Act (CSLCA). Part of the act, called Title IV, provided US companies the legal right to use resources acquired in space. As noted above, the Outer Space Treaty, under Article VI, requires that nations put into place authorization and supervision regimes to cover activities of their nongovernment organizations, including commercial companies, but there is no international authority that provides an oversight function. Countries that are developing national legislation are in part responding to this obligation.

Following early US efforts spurred by the CSLCA, other countries have moved aggressively to attract and support space resources companies. Japan has created a $1 billion government fund to support domestic space start-ups and is conducting policy reviews specific to enabling commercial activities on the Moon. And Luxembourg, with its passage of a licensing framework, has put into place an extensive policy and financial initiative designed to attract space resource companies.

The policy front has also seen movement. The current US administration has enacted regulatory reform to support and enable commercial space development as a key initiative. And in April 2018, the House of Representatives passed the American Space Commerce Free Enterprise Act, which provides a regulatory framework to support nontraditional commercial space activities, including space resources development. Internationally, recent sessions of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) have included an agenda item on “General exchange of views on potential legal models for activities in exploration, exploitation, and utilization of space resources.”

#### ONLY an international framework solves – it solves clarity, prevents erosion of norms due to exceptions, AND prevents disparity which leads to control

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The first concern is establishing clear regulations regarding asteroid mining. With an intent to establish clear regulations with respect to asteroid mining and to legalise material extraction from the moon and other celestial bodies by private companies in the US, the US government legalised space mining in 2015 by introducing the US Commercial Space Launch Competitiveness Act, 2015.[xxvii] This move was heartily welcomed by the private companies as it provided legitimacy to their planned activities. Subsequently in 2017, Luxembourg followed suit.[xxviii] While the US has been a spacefaring nation for many decades now, Luxembourg aspires to become a global leader in the nascent race to mine resources in outer space. In the 1980s the tiny European nation arose out of almost nowhere to become a leader in the satellite communications industry; today it is looking to the skies again, hoping to be the Silicon Valley of asteroid mining.[xxix] In the backdrop of a thriving steel industry that faced trade recession during the oil crisis of 1973, Luxembourg is trying to capitalise on the potential of space mining. As Prime Minister Xavier Bettel put it, “We realized it wouldn't be forever, the steel, so we decided to do other things.”[xxx] Similarly, looking beyond oil, the UAE is framing its policy approaches to make advances in two key areas: human space exploration, and commercial activities of resource extraction through mining.[xxxi] The two formal pieces of legislation (passed by the US and Luxembourg) provide an answer to the complex question of ownership in outer space; the two-word answer appears to be, “finders, keepers”. The US Commercial Space Launch Competitiveness Act, 2015 states: “A US citizen engaged in commercial recovery of an asteroid resource or a space resource shall be entitled to any asteroid resource or space resource obtained.”[xxxii] This legislation gives US space firms the right to own, keep, use, and sell the spoils of the cosmos as they deem fit. Luxembourg’s legislation is fairly analogous to the US Act, giving mining companies the right to keep their plunder. However, unlike the US law, Luxembourg’s does not require a company’s major stakeholders to be based in the country to enjoy its safeguards; the only requirement is for that company to have an office in the country.[xxxiii] In 2017, Japan entered into a five-year agreement with Luxembourg for mining operations in celestial bodies. Japan today appears a step closer to realising its objective of asteroid mining with two Japanese rovers, Minerva II-1, of JAXA landing on the surface of the asteroid named Ryugu in September 2018.[xxxiv] Earlier, Portugal and the UAE signed similar cooperation agreements with Luxembourg.[xxxv] Meanwhile, a few other countries—which have been critical of the US and Luxembourg, at the forefront of the space mining efforts—have also decided to join the field. The increasingly competitive and contested nature of outer space activities is spurring major spacefaring nations to push the boundaries in their space exploration. Asteroid mining could possibly become the next big thing and is already seeing a race among the space powers. The US and Luxembourg are at the forefront in space resource extraction in terms of the policy frameworks and funding.[xxxvi] Even as the US has clarified that the US Space Act 2015 is being misunderstood and that there is no change in the US policy towards national appropriation of space, the reality is that it has already spurred a major debate.[xxxvii] China and Russia are among those countries that are following on the path of the US and Luxembourg in undertaking mining missions in space. According to media reports, Ye Peijian, chief commander and designer of China’s lunar exploration programme has stated that China would send the first batch of asteroid exploration spacecraft around 2020.[xxxviii] Speaking to China’s Ministry of Science and Technology-run newspaper, Science and Technology Daily, Ye said that these asteroids have a high concentration of precious metals, which could rationalise the huge cost and risks involved in these activities as their economic value could run into the trillions of US dollars. Therefore, extraction, mining and transporting them back to Earth through robotic equipment will be a significant activity. Chinese scientists are working on missions to “bring back a whole asteroid weighing several hundred tonnes, which could turn asteroids with a potential threat to Earth into usable resources.”[xxxix] Ye was also quoted as saying that China has plans of “using an asteroid as the base for a permanent space station.”[xl] Helium mining on the moon is also part of China’s goals.[xli] Russia, for its part, is also responding to the space-mining developments of the last decade. For one, it plans to have a permanent lunar base somewhere between 2015 and 2020 for possible extraction of Helium.[xlii] Even as Russia’s official position on asteroid mining is that it is forbidden under the 1967 OST—which states that space is the “province of mankind”—the Russian industry players are of the view that they must follow the lead taken by the US and Luxembourg.[xliii] In early 2018, the director of the Scientific-Educational Center for Innovative Mining Technologies of the Moscow-based National University of Science and Technology MISIS (NUST MISIS), Pavel Ananyev, spoke about the Russian ambitions and proposed activities including space drilling rigs, water extraction on the Moon and 3D printers at space stations.[xliv] Russia’s private space companies including Dauria Aerospace, one of the first Russian private space companies, also hold the opinion that they must go forward in the same direction and call for a larger space to private sector to engage in extracting space resources.[xlv] Moscow may not have yet actively pursued space mining and resource extraction, but it is likely to pick up pace in the coming years alongside global efforts. Moscow clearly has a capacity gap in terms of funding because its earlier plans to have a permanent base in the Moon by 2015 is yet to happen. India, too, has ambitions in extraterrestrial resource extraction. In fact, a year after the US legislation, Prabhat Ranjan, executive director of Technology Information, Forecasting and Assessment Council (TIFAC), a policy organisation within the Department of Science and Technology, made a case for India to push ahead with lunar and asteroid mining. He said, “Moon is already being seen as a mineral wealth and further one can go up to the asteroids and start exploiting this. This can be a big game changer and if India doesn’t do this, we will lag behind.”[xlvi] More recently, Dr. K Sivan, Chairman of the country’s civil space organisation, Indian Space Research Organisation (ISRO), talked about ISRO’s plans for helium-3 extraction and said, “the countries which have the capacity to bring that source from the moon to Earth will dictate the process. I don’t want to be just a part of them, I want to lead them.”[xlvii] However, gaining proficiency in such missions is not easy – the NASA and ESA (the European Space Agency) have been discussing these possibilities for a longer time, albeit quietly. The ISRO Chairman’s response was characterised by an Indian commentator as “aspirational” and “emotional”, clearly conceding that the country’s technological wherewithal is yet to be adequate.[xlviii] Importantly, it is not clear how the legal and regulatory aspects of space mining operations are being dealt with. There was one instance, though, when Luxembourg and Japan in a joint press statement said, “The exchange of information may cover all the issues of the exploration and commercial utilization of space resources, including legal, regulatory, technological, economic, and other aspects.”[xlix] Whether such legalisation is truly legal is arguable. Space Mining: Legal or Not? The Outer Space Treaty (OST) of 1967, considered the global foundation of the outer space legal regime, along with the other four associated international instruments have provided the fundamental basis for outer space activities by prohibiting certain activities and emphasising aspects such as the “common heritage of mankind”. These agreements have been useful in highlighting the global common nature of outer space. At the same time, however, they have been insufficient and ambiguous in providing clear regulations to newer space activities such as asteroid mining. Based on the premise of ‘res communis’, the magna carta of space law, the OST, illustrates outer space as “the province of all mankind”.[l] Under Article I, States are free to explore and use outer space and to access all celestial bodies “on the basis of equality and in accordance with international law.”[li] Although the OST does not explicitly mention “mining” activities, under Article II, outer space including the Moon and other celestial bodies are “not subject to national appropriation by claim of sovereignty” through use, occupation or any other means.[lii] Furthermore, the Moon Agreement, 1979, not only defines outer space as “common heritage of mankind” but also proscribes commercial exploitation of planets and asteroids by States unless an international regime is established to govern such activities for “rational management,” “equitable sharing” and “expansion of opportunities” in the use of these resources.[liii] Slipping conveniently through the loophole in the OST, both the US and Luxembourg have authorised companies to claim exclusive ownership over extracted resources (but not of the asteroid itself). Proponents argue that since no sovereign nation is actually asserting rights over an area of outer space, instead, it is only a private unit claiming rights over singular resources, the treaty norm, “national appropriation by claim of sovereignty”, is not being violated. In the words of renowned space lawyer, Frans von der Dunk, “In terms of the law, yes it’s true that no country can claim any part of outer space as national territory — but that doesn’t mean private industry can’t mine resources.”[liv] Quoting reference from maritime law, Luxembourg regards space resources as appropriable akin to fish and shellfish, but celestial bodies and asteroids are not, just like the high sea. It is noteworthy that out of the only 18 nations that have ratified the Moon Agreement,[lv] none are major spacefaring nations, thereby giving themselves a convenient leeway to not abide by the same. These unilateral initiatives have set off a critical response from the international community. Applying literal interpretation of the OST, there is certainly room to construe that space mining may be legal, compared to the Moon Agreement whose prohibition is absolute. However, taking into consideration the letter and spirit of the OST, strengthened by the Moon Agreement, the argument that “national appropriation” only extends to appropriation of territory and not appropriation of resources is a far reach. That resource extraction is contemplated, albeit implicitly, in the OST, is nothing but logical. Not only have such claims of possessory rights not been recognised in the past, there is also global consensus regarding its illegality.[lvi] It therefore forms a part of customary international law, despite the Moon Agreement not having been widely ratified. In this light, the legalisation of space mining is a sheer violation of the elemental principles of international space law. Yet, there is no clarity on what activity is allowed and what is prohibited in outer space under the existing law.[lvii] There is ambiguity around most issues—from “who would license and regulate asteroid mining operations” to the legality of these activities as per the existing international space law.[lviii] When comparing it to the law of the seas, resource appropriation in the high seas and deep seabed is governed by the United Nations Convention on the Law of the Sea (UNCLOS), 1982, and that in Antarctica, as per the Protocol on Environmental Protection to the Antarctic Treaty, 1991. While the former is strictly regulated under Part XI of UNCLOS, the latter is completely forbidden but for scientific purposes. The law of the sea argument—“owning the fish, not the sea”—cannot be applied to outer space primarily because fish are living resources that can reproduce and therefore are renewable. Outer space resources, on the other hand, are depletable: once harvested, they cannot be replenished. The analogy with fish and seas, therefore, is not a fair one and its transposition to outer space and celestial bodies would be inaccurate. Perhaps a more comparable regime is the deep seabed, which contemplates property rights over mineral extraction. The utilisation and ownership of the deep seabed’s resources are exclusively structured around the International Seabed Authority (ISA), which is responsible for organising, carrying out and controlling all activities in the seabed.[lix] Not only must State parties seek sanction from the ISA before beginning resource exploitation, but the fiscal benefits from seabed mining must also be shared among all.[lx] Evidently, even the UNCLOS upholds State ownership and fair distribution over individual ownership and self-centred gains.[lxi] By allowing private ownership, the US and Luxembourg are once again in contravention of the very same law they are relying on. The touchstone principle, “province of all mankind” is also being defeated. Therefore, to even reap the limited benefits as under UNCLOS, at least the derivation must be made alike. This argument too falls flat. The Way Ahead Undoubtedly, growing technological adeptness has made space mining inevitable and, therefore, the question is no longer “if” but “when”. Nevertheless, a scenario where companies can, solely based on domestic laws, steadily exploit mineral resources in outer space, would be universally unacceptable. Minus regulations, the realisation of space exploitation will create great disparity between nations and disrupt dynamics of the world economy. Regulations are particularly important in the context of the space debris problem. We definitely do not wish for a future, befittingly described by renowned engineer and inventor Graham Hawkes, thus: “Space exploration promised us alien life, lucrative planetary mining, and fabulous lunar colonies. News flash, ladies and gents: Space is nearly empty. It’s a sterile vacuum, filled mostly with the junk we put up there.”[lxii] Therefore, it is extremely important that resource appropriation is carried out in an ethical manner, without interrupting safe and secure access to outer space, simultaneously allowing all countries a share in the proceeds. Technological advances and financial readiness are pushing both, states and non-state players towards new ventures in outer space. Yet, the rules of engagement especially dealing with the new commercial activities are far from ideal. There is a clear and urgent need to debate and come up with either a new regulation or accommodate the space mining activities within the existing international legal measures. Experts have articulated that these could possibly be addressed under the existing property law principles or old mining law principles.[lxiii] However, given the scale of activities that states and non-state parties will engage in, the ability of the existing regime to address space mining could be highly inadequate. The second option would be to develop a new instrument including an institutional architecture that would set out the parameters for activities related to resource extraction and space mining. Since there are a good number of commercial players playing a formidable role in asteroid mining, there has to be space for commercial players in the new gig, which might be a big departure from the earlier era institutions that saw states being the sole authority in regulating activities in outer space. A clear role for commercial players has been articulated for some time but the global space community has yet to reach a consensus in how they can be incorporated into the global governance debates. The apprehension on the part of a number of states is driven by the fact that private sector participation is still largely a western phenomenon. This trend may be undergoing change in other parts of the world but until there is a sizeable private sector community in other major spacefaring powers, there is a fear that the western bloc of countries may stand to gain from the industry being represented in the global governance debates. A third possible option is to get a larger global endorsement of the Moon Treaty, which highlights the common heritage of mankind. The Moon Treaty is important as it addresses a “loophole” of the OST “by banning any ownership of any extraterrestrial property by any organization or private person, unless that organization is international and governmental.”[lxiv] But the fact that it has been endorsed only by a handful of countries makes it a “failure” from the international law perspective.[lxv] Nevertheless, efforts must be made to strengthen the support base for the Moon Agreement given the potential pitfalls of resource extraction and space mining activities in outer space. Signatories to the Moon Treaty can take the lead within multilateral platforms such as the UN to debate the usefulness of the treaty in the changed context of technological advancements and new geopolitical dynamics, and potentially find compromises where there are disagreements. Pursuing a collective approach is ideal. An example is UNCLOS, which demonstrates that the international society possesses the capability of regulating mining quarters deemed to be the “province of mankind”. However, a sui generis legal framework must be crafted because the difference between the marines and outer space and their resources is wide, and the regulations are too region-specific to permit a superimposition of the oceanic regime to outer space. A sound legal environment will protect both the company performing operations and its beneficiaries, while ensuring even-handed resource allocation. In addition, regulations spelling out safety standards and identifying safety zones around mining operations could be useful in ensuring safe and secure operations in outer space. It would be wrong, however, to say that the international community has not debated over this. In fact, one of the main agenda points of the fifty-seventh session of UNCOPUS Legal Committee held in April 2018, was especially devoted to “general exchange of views on potential legal models for activities in the exploration, exploitation and utilization of space resources.”[lxvi] Upon evaluation, it is clear that countries are not against space mining as such; rather the contentious points are vis-à-vis authorisation, regulation, and where to place responsibility. There also appears to be concurrence regarding the need for international coordination efforts of some sort. Over the last two years, The Hague Space Resources Governance Working Group,[lxvii] established with the purpose of “assess[ing] the need for a regulatory framework for space resource activities, has identified 19 “building blocks”,[lxviii] encompassing subject matters that could be included in such a regulatory framework. Although this leaves a lot of hope for the legitimate mining of space resources, its status is still pending. Also, several questions need to be agreed upon by the global space policy community before the establishment of a framework. First, there must be an agreement among all the space powers on the need for a global governance framework for the use of space resources. This must be followed by detailed deliberations on the scope, mandate and objectives of such a framework. Can and should there be safety zones and exclusive rights be recognised under such a framework and how one can ensure equitable sharing of the resources, and lastly, the role of industries and how the interests of the industry as pioneers in this area can be secured. These are all pertinent questions that need to be considered and debated before an international regime for extraction and use of space resources can be established.[lxix] Even legal space mining activity could have serious impacts in two ways. For instance, any technological spinoffs that a country might have could add to the space weaponisation debate. Two, the erosion of norms with regard to space mining could have a cascading effect on other norms in the same issue area such as weaponisation of space. It is imperative for nations to actively combine their efforts to ensure that this activity transpires in the most globally acceptable manner and not one which stirs anarchism. The ancient Roman maxim, ‘Quod omnes tangit ab omnibus approbatur’ (What touches all must be approved by all) gains due traction in this kind of a scenario. Therefore, a universal activity like space exploration mandates an international guideline; or else, the first haul from mining, instead of earning admiration and exultation, will only be enmeshed in litigation.

## 1AC—Advantages

### Advantage—Space War

#### Private space mining goes existential – 3 reasons:

#### 1] Violates ilaw -- enough to trigger co-operation and escalation

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Still, this rhetoric is somewhat misleading. American public investment in space dwarfs Russian and Chinese investments combined: in 2018, the United States invested $41 billion whereas China invested $5.8 billion, and Russia invested $4.2 billion.139 Moreover, this spending does not account for private investment in space. Unfortunately, this author has been unable to procure aggregate data on total U.S. private investment. However, for reference, Jeff Bezos has claimed he invests $1 billion each year of Amazon stock to finance Blue Origins.140 Elon Musk spent $100 million to found SpaceX in 2002.141 In 2019, the company raised $1.33 billion in three rounds of funding.142 Additionally, SpaceX has estimated its broadband satellite project, Starlink, will cost at least $10 billion to build and deploy.143 Finally, Bryce Technology reported that start up space ventures raised $5.7 billion in funding in 2019.144 Whatever the total number is, it is quite large and likely in the tens of billions a year. Russia and China simply do not have the same level of private investment. This is not to say that the Administration is wrong for taking foreign threats in outer space seriously. It should, precisely **because the Russians and Chinese take these threats seriously**. The **U**nited **S**tates **should not**, however, **start a space race** when it is already light years ahead of its rivals, **as this would** repeat the mistake of the first space race – **permit**ting **private industry**, which Eisenhower warned against, **to dictate** American **policy and** thereby **create a technocracy**.145 Naturally, this talk of competition begs the question, what do the Russians and Chinese actually want in outer space? D. Engagement with Russia and China? i. Russia **Russia has** strongly **rejected the** Artemis **Accords as a violation of** **i**nternational **law**.146 After the United States excluded Russia from the Artemis Accords, Dmitry Rogozin, Chief of Roscosmos, fumed, “The principle of invasion is the same, whether it be the Moon or Iraq. The creation of a ‘coalition of the willing’ is initiated. Only Iraq or Afghanistan will come out of this.”147 More recently, he called the Artemis Accords a “political project,” and compared it to NATO.148 When asked if Russia would partner with NASA on Artemis, Rogozin answered, “Frankly speaking, we are not interested in participating in such a project.”149 **Ominously**, Rogozin signaled **a Russian shift towards partnering with the Chinese**, “We respect their results…[China] is definitely our partner.”150 In a sign **of how quickly this partnership is forming**, just a few weeks later, Rogozin announced that he and the Director of the China National Space Administration, Zhang Kejian, had agreed to “probably” build a lunar research base together.151 On March 9, 2021, **Russia and China** signed an agreement to **build** **this base** together.152 This partnership is dripping with irony. Recall that, in 2016, Russia issued a complaint about the Space Act before COPUOS.153 But that complaint walked a fine line and never directly claimed that American resource exploitation in space violated the OST.154 Indeed, the Russians appeared more interested in signaling to the United States their interest in “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.”155 As discussed, the Russians care less about complying with international law than being able to shape it to suit their own interests. Though they may lack the level of investment and advanced technologies of the United States, they appear willing to join the Chinese who have a long-term plan to achieve space supremacy. Of course, **the creation of Russo-Chinese partnership** and system in space to challenge the Artemis Accords **would render** Rogozin’s **fear of NATO a self-fulfilling** prophecy.

#### 2] Competition -- Resources in space explodes geopolitical tensions, escalates through satellite use and posturing, and detracts from public interest

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Major space-faring nations are not among the 16 countries party to the treaty, but they should arguably come to some equitable agreement, since international competition over natural resources in space may very well transform into conflict. Take platinum-group metals. Mining companies have found about 100,000 metric tons of the stuff in deposits worldwide, mostly in South Africa and Russia, amounting to $10 billion worth of production per year, according to the U.S. Geological Survey. These supplies should last several decades if demand for them doesn’t rise dramatically. (According to Bloomberg, supply for platinum-group metals is constrained while demand is increasing.)

Palladium, for example, valued for its conductive properties and chemical stability, is used in hundreds of millions of electronic devices sold annually for electrodes and connector platings, but it’s relatively scarce on Earth. A single giant, platinum-rich asteroid could contain as much platinum-group metals as all reserves on Earth, the Google-backed Planetary Resources claims. That’s a massive bounty. As Planetary Resources and other U.S. and foreign companies scramble for control over these valuable space minerals, competing “land grabs” by armed satellites may come next. Platinum-group metals in space may serve the same role as oil has on Earth, threatening to extend geopolitical struggles into astropolitical ones, something Trump is keen on preparing for. Yesterday he said he’s seriously weighing the idea of a “Space Force” military branch.

NASA’s increasing collaboration with space mining companies could distort and divert efforts previously focused on space exploration.

Moreover, the technology that might enable this free-for-all—versatile “nanosatellites,” no larger than a loaf of bread—is relatively inexpensive. While reporting for a story about these tiny satellites, also known as CubeSats, I came across some missions applicable to mining asteroids. In November, NASA will launch a satellite for a mission called Near-Earth Asteroid Scout, for example. It will deploy a solar sail, propel itself with sunlight, and journey to the asteroid belt, where it will scope out a particular asteroid and analyze its properties. NASA has also awarded grants to Planetary Resources to advance the designs of spectral imagers and propulsion systems for CubeSats, and other missions will develop the satellites’ abilities to communicate and network with each other. NASA also awarded Deep Space Industries contracts to assess commercial approaches for NASA’s asteroid goals, which may involve hosting DSI’s asteroid-prospecting equipment on its missions.

Like all forms of mining, it will be dangerous. If space-mining activities break up asteroids, the resulting debris could be hazardous for satellites, other spacecraft, and astronauts nearby. On the other hand, in a best-case scenario, space mining could be environmentally safe, capture only necessary minerals and water, and, in the more distant future even lead to the construction of a far-flung space station led by NASA and other space agencies, orbiting 200 million miles from Earth and serving as both a mining depot and a pit-stop for passing spacecraft.

But it’s not clear that a pact between the commercial space mining industry and NASA would align with the public’s interest. NASA’s increasing collaboration with space mining companies could distort and divert efforts previously focused on space exploration and basic research, and discourage public interest and engagement in astronomy.

For example, Seager advocated for space mining at a science writing conference I attended in 2015. She’s part of a motley group of advisors for Planetary Resources, including the movie director James Cameron, a lawyer for a prominent Washington D.C. firm, and Dante Lauretta, another astronomer whom I respect. Seager seems to believe that encouraging private space mining will lead to more investments and technological innovation that would enable more scientific research. In a 2012 interview with The Atlantic, for instance, she said, “The bottom line is that NASA is not working the best that it could for space science right now, and so in order for people like me to succeed with my own research goals, the commercial space industry needs to be able to succeed independently of government contracts.”

But if the U.S. and U.S.-based companies lay claim to the richest and most easily accessible prospecting sites, not allowing other companies and nations to share in the wealth, economic and political relations could be damaged. That’s why this seems to be a dangerous path for space explorers. Once you’re on board with the commercial space industry, then you as a researcher must accept, if not support, everything that comes with it. Seager and a few other researchers may be willing to take this risk, but what about the rest of the space science community? Moreover, to succeed, these businesses will seek profitable missions, while science, exploration, and discovery—goals that stimulate public interest—will inevitably have lower priority. (Other commercial spaceflight companies, like Elon Musk’s SpaceX, do generate public interest, but they’re not directly involved in mining asteroids.) NASA may have its shortcomings, but at least its missions and research goals answer to the public. It’s not exactly a welcome thought to imagine more and more of our presence and activity in space being ceded, with NASA’s help, to private industry.

#### Independently, that checks any of their mining good offense

Yan 18 [Laura Yan is a writer in Brooklyn. Her writing has appeared in Wired, GQ, The Cut, Pacific Standard, Longreads, The Outline, and elsewhere. Should We Really Be Mining in Space? May 5, 2018. https://www.popularmechanics.com/space/a20195040/should-we-be-really-be-mining-in-space/]

Imagine, for instance, an asteroid that contains as many platinum-group metals as all reserves on Earth. Businesses will compete for the precious resource, and the competing may soon turn into battle by armed satellites, which can lead back to conflicts on Earth. The act of mining itself could also be dangerous: if space-mining break up asteroids, it could harm other satellites, spacecrafts and astronauts.

Commerical space mining could lead to conflicts between profitability and public interest. "Once you’re on board with the commercial space industry, then you as a researcher must accept, if not support, everything that comes with it," Skibba writes. "To succeed, these businesses will seek profitable missions, while science, exploration, and discovery—goals that stimulate public interest—will inevitably have lower priority,"

#### Specifically, control over resources from mining could ignite geopolitical tensions

Duke, 20, Air University, “Conflict and Controversy in the Space Domain: Legalities, Lethalities, and Celestial Security”, Sergeant Duke served as a US Army intelligence analyst, including 24 months in Iraq in support of Operation Iraqi Freedom I, II, III, and IV. He holds a BA in intelligence studies with a concentration in counterintelligence from American Military University and is now serving in the United States Marine Corps. Sergeant Duke’s research focus is on national security and intelligence, including new approaches to counterterrorism using counterintelligence-based models; autonomous weaponry developments and their applications to international law, armed conflict, and US national security; and the future impacts of the space domain on global economics, intelligence operations, and US national security.URL: <https://www.airuniversity.af.edu/Wild-Blue-Yonder/Article-Display/Article/2362296/conflict-and-controversy-in-the-space-domain-legalities-lethalities-and-celesti/>, KR

Rare earth metals and other minerals are quickly becoming scarce in the United States to the point where the international space race to claim the Moon and Mars has become a top priority, not just for control over them but for the resources available for exploitation. Uranium has even entered the economic radar as a good idea for boosting the American economy instead of remaining too dangerous to mine due to the associated health risks and environmental hazards. This resource is in abundance on the Moon.10 Estimates suggest there may be up to five million tons of Helium-3 (3He) contained within the lunar regolith.11 This has the potential to meet all of mankind's power needs for thousands of years when used with fusion power.12 On top of the resources potentially available, the Moon provides a unique launching position for future missions to Mars with a faster, more direct, and more efficient path to the Red Planet.13 Control over the Moon is an inherent factor in the future of the human race.

Uranium has long been a part of the nuclear fission enterprise on Earth but comes with high costs, including radioactive waste and extreme health and environmental hazards due to the radiation produced in the fission process. Terrestrial reserves of other energy-producing resources, like oil and natural gas, have also been projected to be exhausted within 50–100 years under current and projected mining and usage rates.14 Alternatively, the element tritium (T), which has a half-life of 12.32 years, naturally decays into 3He,15 which can be used to create a new kind of power—fusion power. Fusion power can be generated by combining deuterium (D) with either more D, T, or 3He, using the following calculations shown in order of their ignition temperatures:

D + T = 4He [Helium-4] + n [neutrons] + 17.6 MeV [Million electron Volts]

D + D = T + H [Hydrogen] + 4.0 MeV (50%)

= 3He + n + 3.3 MeV (50%)

D + 3He = 4He + H + 18.4 MeV16

Fusion power can also be created by combining 3He with more 3He, creating Helium-4 (4He).17 The combination of 3He and 3He is the most energy efficient, producing the greatest net energy,18 but also requires the highest ignition temperature to achieve fusion.19

Unfortunately, 3He exists only in minute amounts on Earth.20 The nation that establishes a mining and transportation industry capable of bringing lunar 3He to Earth, and develops a fusion plant network that transforms 3He into power, could control a substantial portion of the planet’s energy industry for decades. Some scientific estimates discount both the estimates of the potential amount of extractable 3He in the lunar regolith and the potential to achieve industrial fusion reactors on Earth capable of processing it. Exemplifying this scientific stance are the calculations of Ian Crawford, who believes both prospects are greatly exaggerated and that there are only approximately 220,507 tons of 3He available in logical extraction areas, such as the titanium-rich lunar basalt flats.21 Despite his dissent, Crawford admits even lunar resources that seem impractical and economically inefficient to transport resources to Earth may provide substantial economic benefits for space-based uses, such as solar power systems and spacecraft fusion engines, for example,22 which would not require transport back to Earth.

#### 3] Tech race -- Pushes other countries to compete with US privatization – increases likelihood for tensions to escalate

Mallick and Rajagopalan 19 [Senjuti Mallick and Rajeswari Pillai Rajagopalan, If space is ‘the province of mankind’, who owns its resources?, 1-24-2019,ORF,https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/, 12-16-2021 amrita]

Meanwhile, **a few other countries**—**which have been critical of the US and** Luxembourg, **at the forefront of** the **space mining** efforts—**have** also **decided to join** the field. **The increasingly competitive and contested nature** of outer space activities is spurring major spacefaring nations to **push the boundaries in** their **space exploration**. **Asteroid mining** could possibly become the next big thing and **is** already **seeing a race** among the space powers. The US and Luxembourg are at the forefront in space resource extraction in terms of the policy frameworks and funding.[xxxvi] **Even as the US has clarified that the** US Space **Act** 2015 **is** being **misunderstood** and that there is no change in the US policy towards national appropriation of space, **the reality** is that it has already **spurred a** major **debate**.[xxxvii] China and Russia are among those countries that are following on the path of the US and Luxembourg in undertaking mining missions in space. According to media reports, Ye Peijian, chief commander and designer of China’s lunar exploration programme has stated that China would send the first batch of asteroid exploration spacecraft around 2020.[xxxviii] Speaking to China’s Ministry of Science and Technology-run newspaper, Science and Technology Daily, Ye said that these asteroids have a high concentration of precious metals, which could rationalise the huge cost and risks involved in these activities as their economic value could run into the trillions of US dollars. Therefore, extraction, mining and transporting them back to Earth through robotic equipment will be a significant activity. Chinese scientists are working on missions to “bring back a whole asteroid weighing several hundred tonnes, which could turn asteroids with a potential threat to Earth into usable resources.”[xxxix] Ye was also quoted as saying that China has plans of “using an asteroid as the base for a permanent space station.”[xl] Helium mining on the moon is also part of China’s goals.[xli] **Russia,** for its part, **is** also **responding to the space-mining developments** of the last decade. For one, it plans to have a permanent lunar base somewhere between 2015 and 2020 for possible extraction of Helium.[xlii] **Even as** Russia’s **official position** on asteroid mining **is that it is forbidden** under the 1967 OST—which states that space is the “province of mankind”—the Russian **industry players** are of the view that they **must follow the** lead taken by the **US** and Luxembourg.[xliii] In early 2018, the director of the Scientific-Educational Center for Innovative Mining Technologies of the Moscow-based National University of Science and Technology MISIS (NUST MISIS), Pavel Ananyev, spoke about the Russian ambitions and proposed activities including space drilling rigs, water extraction on the Moon and 3D printers at space stations.[xliv] **Russia’s private space companies** including Dauria Aerospace, one of the first Russian private space companies, also **hold the opinion that they must go forward** in the same direction and call for a larger space to private sector to engage in extracting space resources.[xlv] **Moscow may not have** yet **actively pursued space mining** and resource extraction, **but it is likely to pick up pace** in the coming years alongside global efforts. Moscow clearly has a capacity gap in terms of funding because its earlier plans to have a permanent base in the Moon by 2015 is yet to happen

#### Market expansion guarantees wars over property rights—governments get quickly involved

Funnell 18 – Anthony, Writer for Future Tense News Citing Dean of Law at University of Adelaide, “War in space 'inevitable' because there's so much money to be made, expert warns”, ABC News, 8/23/2018, https://www.abc.net.au/news/2018-08-24/conflict-in-space-is-inevitable-expert-warns/10146314

A leading Australian space law expert has warned conflict over space assets is "inevitable", and more needs to be done now to avert the potential for hostility. Professor Melissa de Zwart, the Dean of Law at the University of Adelaide, says growing commercial interest in the mining of precious minerals on asteroids and planets has heightened the danger. "I think you have to be a realist about that," she said. "Where you have resources, where you have competition for those resources, where you have investment of money in the extraction of those resources ... there will be an expectation of security around that investment." While full-scale mining is yet to be tried, there is significant international interest. Japanese aerospace agency Jaxa has already successfully landed a robotic craft on an asteroid and taken samples. It currently has another probe hovering over an asteroid named Ryugu. Artist's impression of Hayabusa 2 PHOTO: Artist's impression of Jaxa's robotic craft flying above Ryugu. (Source: JAXA) Two American companies — Deep Space Industries and Planetary Resources — are thought to be the leaders in the field, but in May this year a UK firm called Asteroid Mining Corporation also entered the race. "Those corporations will be looking to the nation-state to say, well, are you going to protect our investment in this business?" Professor de Zwart said. A very crowded space The US Government and American firms continue to play a dominant role in more traditional space technology development and deployment. SpaceX, for example, is a major private supplier of rockets, while the US Air Force currently coordinates international satellite traffic, providing advanced warnings about potentially dangerous space debris. Listen to the episode Are we moving away from the notion that space is for all humankind? And is conflict in space inevitable? But the number of players is rapidly increasing. The OECD's Space Forum says more than 80 countries now have some form of space program, mostly concentrated on rockets, satellites and satellite-related services and technology. They estimate the global industry is worth somewhere around $US400 billion and growing quickly. And that figure could skyrocket if, and when, asteroid mining kicks off. Eric Stallmer, the president of the US-based Commercial Spaceflight Federation, a consortium of 85 space-related organisations and businesses, believes that moment is fast approaching. "I think we are looking at a five to 10-year timetable for developing that technology. It makes for an exciting time," he said

#### Space wars go nuclear

Grego 18 – Laura, Senior Scientist in the Global Security Program at the Union of Concerned Scientists, Postdoctoral Researcher at the Harvard-Smithsonian Center for Astrophysics, PhD in Experimental Physics at the California Institute of Technology, Space and Crisis Stability, Union of Concerned Scientists, 3-19-18, <https://www.law.upenn.edu/live/files/7804-grego-space-and-crisis-stabilitypdf>

Why space is a particular problem for crisis stability For a number of reasons, space poses particular challenges in preventing a crisis from starting or from being managed well. Some of these are to do with the physical nature of space, such as the short timelines and difficulty of attribution inherent in space operations. Some are due to the way space is used, such as the entanglement of strategic and tactical missions and the prevalence of dual-use technologies. Some are due to the history of space, such the absence of a shared understanding of appropriate behaviors and consequences, and a dearth of stabilizing personal and institutional relationships. While some of these have terrestrial equivalents, taken together, they present a special challenge. The vulnerability of satellites and first strike incentives Satellites are inherently fragile and difficult to protect; in the language of strategic planners, space is an “offense-dominant” regime. This can lead to a number of pressures to strike first that don‘t exist for other, better-protected domains. Satellites travel on predictable orbits, and many pass repeatedly over all of the earth‘s nations. Low-earth orbiting satellites are reachable by missiles much less capable than those needed to launch satellites into orbit, as well as by directed energy which can interfere with sensors or with communications channels. Because launch mass is at a premium, satellite armor is impractical. Maneuvers on orbit need costly amounts of fuel, which has to be brought along on launch, limiting satellites‘ ability to move away from threats. And so, these very valuable satellites are also inherently vulnerable and may present as attractive targets. Thus, an actor with substantial dependence on space has an incentive to strike first if hostilities look probable, to ensure these valuable assets are not lost. Even if both (or all) sides in a conflict prefer not to engage in war, this weakness may provide an incentive to approach it closely anyway. A RAND Corporation monograph commissioned by the Air Force15 described the issue this way: First-strike stability is a concept that Glenn Kent and David Thaler developed in 1989 to examine the structural dynamics of mutual deterrence between two or more nuclear states.16 It is similar to crisis stability, which Charles Glaser described as ―a measure of the countries‘ incentives not to preempt in a crisis, that is, not to attack first in order to beat the attack of the enemy,‖17 except that it does not delve into the psychological factors present in specific crises. Rather, first strike stability focuses on each side‘s force posture and the balance of capabilities and vulnerabilities that could make a crisis unstable should a confrontation occur. For example, in the case of the United States, the fact that conventional weapons are so heavily dependent on vulnerable satellites may create incentives for the US to strike first terrestrially in the lead up to a confrontation, before its space-derived advantages are eroded by anti-satellite attacks.18 Indeed, any actor for which satellites or space-based weapons are an important part of its military posture, whether for support missions or on-orbit weapons, will feel “use it or lose it” pressure because of the inherent vulnerability of satellites. Short timelines and difficulty of attribution The compressed timelines characteristic of crises combine with these “use it or lose it” pressures to shrink timelines. This dynamic couples dangerously with the inherent difficulty of determining the causes of satellite degradation, whether malicious or from natural causes, in a timely way. Space is a difficult environment in which to operate. Satellites orbit amidst increasing amounts of debris. A collision with a debris object the size of a marble could be catastrophic for a satellite, but objects of that size cannot be reliably tracked. So a failure due to a collision with a small piece of untracked debris may be left open to other interpretations. Satellite electronics are also subject to high levels of damaging radiation. Because of their remoteness, satellites as a rule cannot be repaired or maintained. While on-board diagnostics and space surveillance can help the user understand what went wrong, it is difficult to have a complete picture on short timescales. Satellite failure on-orbit is a regular occurrence19 (indeed, many satellites are kept in service long past their intended lifetimes). In the past, when fewer actors had access to satellite-disrupting technologies, satellite failures were usually ascribed to “natural” causes. But increasingly, even during times of peace operators may assume malicious intent. More to the point, in a crisis when the costs of inaction may be perceived to be costly, there is an incentive to choose the worst-case interpretation of events even if the information is incomplete or inconclusive. Entanglement of strategic and tactical missions During the Cold War, nuclear and conventional arms were well separated, and escalation pathways were relatively clear. While space-based assets performed critical strategic missions, including early warning of ballistic missile launch and secure communications in a crisis, there was a relatively clear sense that these targets were off limits, as attacks could undermine nuclear deterrence. In the Strategic Arms Limitation Treaty, the US and Soviet Union pledged not to interfere with each other‘s ―national technical means‖ of verifying compliance with the agreement, yet another recognition that attacking strategically important satellites could be destabilizing.20 There was also restraint in building the hardware that could hold these assets at risk. However, where the lines between strategic satellite missions and other missions are blurred, these norms can be weakened. For example, the satellites that provide early warning of ballistic missile launch are associated with nuclear deterrent posture, but also are critical sensors for missile defenses. Strategic surveillance and missile warning satellites also support efforts to locate and destroy mobile conventional missile launchers. Interfering with an early warning sensor satellite might be intended to dissuade an adversary from using nuclear weapons first by degrading their missile defenses and thus hindering their first-strike posture. However, for a state that uses early warning satellites to enable a “hair trigger” or launch-on-attack posture, the interference with such a satellite might instead be interpreted as a precursor to a nuclear attack. It may accelerate the use of nuclear weapons rather than inhibit it. Misperception and dual-use technologies Some space technologies and activities can be used both for relatively benign purposes but also for hostile ones. It may be difficult for an actor to understand the intent behind the development, testing, use, and stockpiling of these technologies, and see threats where there are none. (Or miss a threat until it is too late.) This may start a cycle of action and reaction based on misperception. For example, relatively low-mass satellites can now maneuver autonomously and closely approach other satellites without their cooperation; this may be for peaceful purposes such as satellite maintenance or the building of complex space structures, or for more controversial reasons such as intelligence-gathering or anti-satellite attacks. Ground-based lasers can be used to dazzle the sensors of an adversary‘s remote sensing satellites, and with sufficient power, they may damage those sensors. The power needed to dazzle a satellite is low, achievable with commercially available lasers coupled to a mirror which can track the satellite. Laser ranging networks use low-powered lasers to track satellites and to monitor precisely the Earth‘s shape and gravitational field, and use similar technologies. 21 Higher-powered lasers coupled with satellite-tracking optics have fewer legitimate uses. Because midcourse missile defense systems are intended to destroy long-range ballistic missile warheads, which travel at speeds and altitudes comparable to those of satellites, such defense systems also have inherent ASAT capabilities. In fact, while the technologies being developed for long-range missile defenses might not prove very effective against ballistic missiles—for example, because of the countermeasure problems associated with midcourse missile defense— they could be far more effective against satellites. This capacity is not just theoretical. In 2007, China demonstrated a direct-ascent anti-satellite capability which could be used both in an ASAT and missile defense role, and in 2009, the United States used a ship-based missile defense interceptor to destroy a satellite, as well. US plans indicated a projected inventory of missile defense interceptors with capability to reach all low earth orbiting satellites in the dozens in the 2020s, and in the hundreds by 2030.22 Discrimination The consequences of interfering with a satellite may be vastly different depending on who is affected and how, and whether the satellite represents a legitimate military objective. However, it will not always be clear who the owners and operators of a satellite are, and users of a satellite‘s services may be numerous and not public. Registration of satellites is incomplete23 and current ownership is not necessarily updated in a readily available repository. The identification of a satellite as military or civilian may be deliberately obscured. Or its value as a military asset may change over time; for example, the share of capacity of a commercial satellite used by military customers may wax and wane. A potential adversary‘s satellite may have different or additional missions that are more vital to that adversary than an outsider may perceive. An ASAT attack that creates persistent debris could result in significant collateral damage to a wide range of other actors; unlike terrestrial attacks, these consequences are not limited geographically, and could harm other users unpredictably. In 2015, the Pentagon‘s annual wargame**,** or simulated conflict, involving space assets focused on a future regional conflict. The official report out24warnedthatit was hard to keep the conflict contained geographically when using anti-satellite weapons: As the wargame unfolded, a regional crisis quickly escalated, partly because of the interconnectedness of a multi-domain fight involving a capable adversary. The wargame participants emphasized the challenges in containing horizontal escalation once space control capabilities are employedto achieve limited national objectives. Lack of shared understanding of consequences/proportionalityStates havefairly similar understandings of the implications of military actions on the ground, in the air, and at sea,built over decades of experience. The United States and the Soviet Union/Russia have built some shared understanding of each other‘s strategic thinking on nuclear weapons, though this is less true for other states with nuclear weapons. But in the context of nuclear weapons, there is an arguable understanding about the crisis escalation based on the type of weapon (strategic or tactical) and the target (counterforce—against other nuclear targets, or countervalue—against civilian targets). Because of a lack of experience in hostilities that target space-based capabilities, it is not entirely clear what the proper response to a space activity is and where the escalation thresholds or “red lines” lie. Exacerbating this is the asymmetry in space investments; not all actors will assign the same value to a given target or same escalatory nature to different weapons.

#### Nuclear war causes extinction.

Starr ’17 (Steven; director of the University of Missouri’s Clinical Laboratory Science Program, senior scientist at the Physicians for Social Responsibility, Associate member of the Nuclear Age Peace Foundation, expert in the environmental consequences of nuclear war; 1/9/17; “Turning a Blind Eye Towards Armageddon — U.S. Leaders Reject Nuclear Winter Studies”; <https://fas.org/2017/01/turning-a-blind-eye-towards-armageddon-u-s-leaders-reject-nuclear-winter-studies/>; Federation of American Scientists; accessed 11/24/18; TV) [AV]

The detonation of an atomic bomb with this explosive power will **instantly ignite fires** over a surface area of three to five square miles. In the recent studies, the scientists calculated that the **blast**, **fire**, and **radiation** from a war fought with 100 atomic bombs could produce **direct fatalities** comparable to all of those worldwide in World War II, or to those once estimated for a “**counterforce**” **nuclear war** between the superpowers. However, the **long-term environmental effects** of the war **could** significantly disrupt the global weather for at least a decade, which would likely **result in** a vast **global famine**. The scientists predicted that **nuclear firestorms** in the burning cities would cause at least five million tons of **black carbon smoke** to quickly rise above cloud level into the stratosphere, where it could not be rained out. The smoke would circle the Earth in **less than two weeks** and would form **a** global **stratospheric smoke layer** that **would remain for** more than **a decade**. The smoke would absorb warming sunlight, which would **heat the smoke** to temperatures near the boiling point of water, producing **ozone losses of** 20 to **50 percent** over populated areas. This would almost double the amount of UV-B reaching the most populated regions of the mid-latitudes, and it would create UV-B indices unprecedented in human history. In North America and Central Europe, the time required to get a painful sunburn at mid-day in June could decrease to as little as six minutes for fair-skinned individuals. As the smoke layer blocked warming sunlight from reaching the Earth’s surface, it would produce the **coldest** average **surface temperatures** in the last 1,000 years. The scientists calculated that global **food production would decrease** by 20 to **40 percent** during a five-year period following such a war. Medical experts have predicted that the shortening of growing seasons and corresponding decreases in agricultural production could cause up to **two billion** people to perish from **famine**. The climatologists also investigated the effects of a nuclear war fought with the vastly more powerful modern **thermonuclear** weapons possessed by the United States, Russia, China, France, and England. Some of the thermonuclear weapons constructed during the 1950s and 1960s were 1,000 times more powerful than an atomic bomb. During the last 30 years, the average size of thermonuclear or “strategic” nuclear weapons has decreased. Yet today, each of the approximately 3,540 strategic weapons deployed by the United States and Russia is seven to **80 times** more powerful than the atomic bombs modeled in the India-Pakistan study. The smallest strategic nuclear weapon has an explosive power of **100,000 tons of TNT**, compared to an atomic bomb with an average explosive power of 15,000 tons of TNT. Strategic nuclear weapons produce much larger nuclear firestorms than do atomic bombs. For example, a standard Russian 800-kiloton warhead, on an average day, will ignite fires covering a surface area of 90 to 152 square miles. A **war** fought with hundreds or thousands of U.S. and Russian strategic nuclear weapons would **ignite immense** **nuclear firestorms** covering land surface areas of many thousands or **tens of thousands** of square miles. The scientists calculated that these fires would produce up to **180 million tons** of black carbon soot and **smoke**, which would form a dense, **global stratospheric smoke layer**. The smoke would remain in the stratosphere for 10 to **20 years**, and it **would block** as much as **70 percent of sunlight** from reaching the surface of the Northern Hemisphere and 35 percent from the Southern Hemisphere. So much sunlight would be blocked by the smoke that the noonday sun would resemble a full moon at midnight. Under such conditions, it would only require a matter of days or weeks for daily minimum **temperatures** to **fall below freezing** in the largest agricultural areas of the Northern Hemisphere, where freezing temperatures would occur every day for a period of between one to more than two years. Average surface temperatures would become colder than those experienced 18,000 years ago at the height of the last Ice Age, and the prolonged cold would cause average rainfall to decrease by up to 90%. Growing seasons would be completely eliminated for more than a decade; it would be **too cold and dark** to grow food crops, **which would doom the** majority of the **human population.** NUCLEAR WINTER IN BRIEF The profound cold and darkness following nuclear war became known as nuclear winter and was first predicted in 1983 by a group of NASA scientists led by Carl Sagan. During the mid-1980s, a large body of research was done by such groups as the Scientific Committee on Problems of the Environment (SCOPE), the World Meteorological Organization, and the U.S. National Research Council of the U.S. National Academy of Sciences; their work essentially supported the initial findings of the 1983 studies. The idea of nuclear winter, published and supported by prominent scientists, generated extensive public alarm and put political pressure on the United States and Soviet Union to reverse a runaway nuclear arms race, which, by 1986, had created a global nuclear arsenal of more than 65,000 nuclear weapons. Unfortunately, this created a backlash among many powerful military and industrial interests, who undertook an extensive media campaign to brand nuclear winter as “bad science” and the scientists who discovered it as “irresponsible.” Critics used various uncertainties in the studies and the first climate models (which are primitive by today’s standards) as a basis to criticize and reject the concept of nuclear winter. In 1986, the Council on Foreign Relations published an article by scientists from the National Center for Atmospheric Research, who predicted drops in global cooling about half as large as those first predicted by the 1983 studies and described this as a “nuclear autumn.”

#### Crude oil + soot blackout thump any defense

Snydera and Ruyle 17 (Brian F.Snydera and Leslie E. Ruyle, 12-15-2017, [Brian F. Snyder. Department of Environmental Science, Louisiana State University, United States. Leslie E. Ruyle. Center on Conflict and Development, Texas A&M University, United States]"The abolition of war as a goal of environmental policy," No Publication, [https://www.sciencedirect.com/science/article/pii/S0048969717316431?via%3Dihub)//SLC](https://www.sciencedirect.com/science/article/pii/S0048969717316431?via%3Dihub)//CHS) PK

While the precise impacts of a hypothetical nuclear war are difficult to predict, the detonation of the world's nuclear weapons would plausibly kill all or nearly all humans on Earth and initiate a mass extinction event. There are a total of about 9400 nuclear warheads in active service around the world, with approximately 8300 of these weapons in U.S. and Russian arsenals (Kristensen and Norris, 2017a). Because of government secrecy, it is difficult to reliably estimate the total explosive power contained in these warheads, but in most cases, each warhead ranges between 100 and 1200 kt of TNT equivalent (for comparison, the bombs dropped on Hiroshima and Nagasaki had yields of approximately 15–20 kt). The combined arsenals of the U.S. and Russia likely have a yield of at least 2–3 billion tons of TNT equivalent (Kristensen and Norris, 2017b,c). 2.1. Nuclear winter In the 1980s climate scientists used simple and early climate models to estimate the effects of large-scale nuclear wars on climate. The estimates they derived were catastrophic. For example, Turco et al. (1983) reported temperature reductions of 43 °C for 4 months in the Northern Hemisphere following nuclear war using the explosive power of 10 billion tons of TNT.1 As the cold war ended, interest in modelling the climate effects of nuclear war declined and some policy-makers considered the threat of nuclear winter to be either disproved or exaggerated (Martin, 1988). Toon et al. (2007) and Robock et al. (2007) reignited interest in the climate effects of nuclear war. Toon et al. (2008) modeled the effects of a medium scale nuclear war with a total explosive yield of 440 million tons of explosive yield (far less than current U.S. and Russian arsenals) and estimated global soot2 emissions of 180 Tg. Using a more conservative estimate of 150 Tg of soot, Toon et al. estimated that this emission would be sufficient to reduce global temperatures by about 8 °C and energy flux by 150 W/m2 ; for comparison, the cumulative greenhouse gas emissions to the atmosphere since the industrial revolution have increased energy flux by 3 W/m2 (Butler and Montzka, 2017). Robock et al. (2007) modeled a similar 150 Tg smoke emission and found similar results including temperature reduction of about 8 °C lasting for several years. Low temperatures reduced evapotranspiration and weakened the global hydrological cycle and Hadley cells. As a result, precipitation decreased globally by 45% with especially dramatic decreases in the agricultural areas of the United States. In the Northern Hemisphere, growing seasons would be shortened by about 100 days for about 3 years. This would preclude most food production over most of the world for several years. Mills et al. (2014) conducted a detailed analysis of the effects of a small (1.5 million ton) regional exchange lofting just 5 Tg of soot into the atmosphere. This war would be equivalent to an exchange of 100 Hiroshima-sized bombs between, for example, India, Pakistan, or China. Mills et al. found global temperature decreases of 1.6 °C. To our knowledge, no one has studied the effects of a multi-billion ton nuclear exchange using modern atmospheric models. If, as Toon et al. and Robock et al. suggest, a 440 million ton war results in temperature reductions of 8 °C for a decade and a 100 day reduction in the growing season, it is reasonable to assume that a one to five billion ton war would not be survivable for the majority of people on earth. However, as populations and population centers grow, the effects of nuclear wars on the biosphere will also grow. The consequences of nuclear winter increase as the amount of fuel (buildings, cars, biomass, liquid and solid fuels) added to a targeted area increase. As population centers grow and densify over time, the amount of soot added to the stratosphere as the result of any given nuclear exchange may increase (depending in part on building materials). As a result, the nuclear winter resulting from a 400 million ton yield global war in 2020 may be far more severe than if the same war occurred in 2000. Further, there are reasons to believe that the soot emissions from a hypothetical nuclear exchange are conservative because they focus on urban areas and often do not incorporate non-urban energy infrastructure. For example, if ignited and burned completely, the U.S. Strategic Petroleum Reserve (SPR) alone contains about 14.5 Tg of soot emissions.3 Including all crude held in U.S. commercial facilities, the potential soot emissions increase to 24 Tg. Thus, incorporating crude oil storage in the U.S. alone would increase soot generation estimates by about 16%. Similarly, nuclear war planners would be likely to target coal, oil and gas fields in the U.S., Russia, and their allies. This unaccounted for fuel could increase the total soot contribution to the atmosphere, potentially deepening the resulting nuclear winter. 2.2. Acute effects of particulate matter Studies of nuclear winter typically focus on the effects of smoke lofted into the stratosphere during nuclear firestorms. However, a larger proportion of smoke following nuclear war will be trapped in the troposphere where it would have significantly acute impacts on human and non-human species. Crutzen et al. (1984) calculated that following a major nuclear war (about 5 billion tons of explosives, roughly the combined U.S. and Russian deployed nuclear arms as of 2017) smoke would cover about 30–40% of the earth's surface with airborne smoke concentrations on the order of 5 mg/m3 . While initially this smoke would be composed of very small particles (b0.1 μm), the particles would rapidly coalesce into the 0.1 to 3 μm range, roughly consistent with the wellstudied PM2.5. For comparison, the EPA's National Ambient Air Quality standard for PM2.5 is 0.012 mg/m3 and as of 2017, the highest PM2.5 concentrations in Asia are typically around 0.3 to 1 mg/m3 .

#### The privatization of space locks us into current thought about ownership and land rights—only the aff is key

Jones 21—Craig Henry Jones [PhD student at Lancaster Environment Center]; “Enclosing the Cosmos: Privatising Outer Space and Voices of Resistance”; *Society+Space*; May 24 2021; https://www.societyandspace.org/articles/enclosing-the-cosmos-privatising-outer-space-and-voices-of-resistance

However, despite the enthusiasm of asteroid mining advocates, the proposed extractive industry is not unproblematic. Whilst the narratives surrounding asteroid mining frame this industry’s future as something certain – discussed in advertising material, websites, and NSE circles in the affirmative – there are still many unanswered questions. Aside from issues of technological and fiscal viability, uncertainty remains surrounding ownership, land rights, and whose future this industry speaks of, for, and mobilises. Due to such uncertainties, actors with vested interests are seeking to enclose the Global Common of Outer Space, ‘opening’ the ‘final frontier’ to what some commentators are referring to as a modern Gold Rush (Cofield, 2016: Elvis and Milligan, 2019: Pandya, 2019). This pursual of enclosure relies – broadly speaking – on the same underlying principle(s) as the enclosure of commons historically and lobbying efforts have resulted in these arguments appearing in legislation in several countries [3]. These manoeuvres to privatise Outer Space rely not only on the enclosure of physical and legislative places but also seek to enclose imaginative spaces through the process(es) of disimagination. Broadly conceived, disimagination is a process that curtails our ability to think critically and imagine new futures through cultural apparatuses and public pedagogies designed to erase the multiplicity of historical realities that deviate from the hegemonic ‘norm’ (Didi-Huberman, 2008: Giroux, 2014). Whilst this concept has been used in Didi-Huberman’s discussion of the destruction of concentration camp materials and Giroux’s work on critical pedagogy and civic rights, the process of disimagination is operating within and upon discourses of Outer Space, as I discuss later in this piece. These attempts at disimagination are not going unchallenged, however, with Ethnofuturist works disrupting the oftentimes de facto futures of Outer Space and asteroid mining. Ethnofuturism critically responds to the disimagination process as it combines the Ethno- (the archaic, indigenous, or cultural histories of peoples) and -futurism (deemed the cosmopolitan, urban, and technological) (Hennoste, 2012). Consequently, Ethnofuturism can be construed as a process by and through which histories that deviate from the hegemonic ‘norm’ are reinvigorated and mobilised to (re)produce alternative discourses of futurity. ‘Ethnofuturism’ here is used as an umbrella term that contains within it futurisms from a variety of groups and people. Examples of such futurisms include, but are not limited to: Afrofuturism, Aotearoa futurism, Cambrofuturism, and Sinofuturism. The following discusses enclosure, disimagination, and Ethnofuturism to problematise these futures of asteroid mining: highlighting how popular NSE discourses draw upon a Eurocentric rendition of a ‘Grand Historical Narrative’. Through this, we may begin to challenge the totalising concept of ‘humanity’ [4] oft-invoked by asteroid mining advocates and turn a more critical lens to these purported futures and the discourses (re)created to justify them.

### Advantage—Debris

#### Mining creates space debris

Boley and Byers 20 (Arron, Department of Physics and Astronomy, University of British Columbia; Michael, Department of Political Science, University of British Columbia) U.S. policy puts the safe development of space at risk, SCIENCE, 9 Oct 2020, Vol 370, Issue 6513, pp. 174-175 <https://www.science.org/doi/full/10.1126/science.abd3402> EE

Mining can generate serious operational concerns. Lunar dust is a known challenge to operations on the Moon. Any surface activity could exacerbate lunar dust migration, including by lofting dust onto trajectories that cross lunar orbits, such as that of NASA's proposed Lunar Gateway (11). Moreover, without cooperation by all actors, the limited number of useful lunar orbits could quickly become filled with space debris.

On asteroids, low escape speeds will make it difficult to prevent the loss of surface material. Even if full enclosures are used, waste material may be purposefully jettisoned. Mining could also lead to uncontrolled outbursts of volatile sublimation after the removal of surface layers. Because the asteroids targeted for mining are likely to be those with small minimum orbit intersection distances, the resulting meteoroid debris streams could threaten lunar operations as well as satellites in Earth's orbit (12). In a worst-case scenario, a trajectory change resulting from mining could eventually lead to an Earth-impact emergency.

Space missions already provide some evidence of these risks. In 2019, during the course of Japan's Hayabusa2 mission, a small impactor was used to make a crater on (162173) Ryugu (13). Some of the resulting anthropogenic meteoroids could begin reaching Earth during the 2033 apparition. In 2022, NASA will test its ability to deflect an asteroid by striking (65803) Didymos B (Dimorphos) with the Double Asteroid Redirection Test spacecraft. This impact will produce anthropogenic meteoroids, with the possibility of immediate delivery to Earth (14). Although these risks are small, they demonstrate how easily human actions can change the near-Earth environment.

#### An increase in space debris and dust from mining collides with key defense satellites

Scoles 15 Sarah Scoles [Freelance science writer, and a contributing writer at WIRED Science, with articles in places like Popular Science, the New York Times, Scientific American, Vice, Outside, and others.], 5-27-2015, "Dust from asteroid mining spells danger for satellites," New Scientist, <https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/> DD AG

IF THE gold mine is too far from home, why not move it nearby? It sounds like a fantasy, but would-be miners are already dreaming up ways to drag resource-rich space rocks closer to home. Trouble is, that could threaten the web of satellites around Earth.

Asteroids are not only stepping stones for cosmic colonisation, but may contain metals like gold, platinum, iron and titanium, plus life-sustaining hydrogen and oxygen, and rocket-fuelling ammonia. Space age forty-niners can either try to work an asteroid where it is, or tug it into a more convenient orbit.

NASA chose the second option for its Asteroid Redirect Mission, which aims to pluck a boulder from an asteroid’s surface and relocate it to a stable orbit around the moon. But an asteroid’s gravity is so weak that it’s not hard for surface particles to escape into space. Now a new model warns that debris shed by such transplanted rocks could intrude where many defence and communication satellites live – in geosynchronous orbit.

According to Casey Handmer of the California Institute of Technology in Pasadena and Javier Roa of the Technical University of Madrid in Spain, 5 per cent of the escaped debris will end up in regions traversed by satellites. Over 10 years, it would cross geosynchronous orbit 63 times on average. A satellite in the wrong spot at the wrong time will suffer a damaging high-speed collision with that dust.

The study also looks at the “catastrophic disruption” of an asteroid 5 metres across or bigger. Its total break-up into a pile of rubble would increase the risk to satellites by more than 30 per cent (arxiv.org/abs/1505.03800).

That may not have immediate consequences. But as Earth orbits get more crowded with spent rocket stages and satellites, we will have to worry about cascades of collisions like the one depicted in the movie Gravity.

#### Clustering makes the risk of collisions *uniquely high* and the risk is understated

Dr. Darren McKnight 17, Ph.D., Technical Director for Integrity Applications, Previously Senior Vice President and Director of Science and Technology Strategy at Science Applications International Corporation, “Proposed Series of Orbital Debris Remediation Activities,” 3rd International Conference and Exhibition on Satellite & Space Missions, 5/13/2017, https://iaaweb.org/iaa/Scientific%20Activity/debrisminutes03166.pdf [graphics omitted]

In the future, this population will be added to primarily from collisions between large objects in orbit as the number of LNT produced is proportional to the mass involved in a collision (or explosion).2 Cataloged debris produced from a catastrophic collision will be liberated at about 1-3 fragments per kilogram of mass involved while LNT production is around 10-40 fragments per kilogram of mass involved. The Iridium/Cosmos collision involved a total mass of 2,000kg and produced over 3,000 trackable fragments and likely 10,000-15,0003 LNT debris. The Feng-Yun purposeful collision yielded over 2,200 trackable fragments and likely over 30,000 LNT from only ~850kg of mass involved. While it is important to prevent these types of events from occurring in the future, the consequence of a collision (based on number of LNT produced) will be proportional to the mass involved in the collision. The term “mass involved” implies a good coupling of the impactor mass with the target mass. For a large fragment (e.g., several kilograms) striking a typical payload (that is densely built) in its main satellite body (vice striking a solar array or other appendage) at hypervelocity speeds (i.e., above 6km/s) will result in all the mass being “involved” in the debris. However, a large fragment striking a derelict rocket body, due to the way that the mass is concentrated at the ends of a rocket body, will likely not result in all of the mass being “involved” in the liberated debris. However, it is likely that when two large derelicts, either rocket bodies or payloads, collide with each other, then all of the mass will be involved due to the likely direct physical interaction between the mass. The table below summarizes the mass involvement scenarios which highlight why the massive-on-massive collisions are the focus of our analyses. Therefore, it is best to prevent the collision of the most massive objects with each other (higher consequence) and the ones that are the most likely (higher probability) since risk is probability multiplied by consequence. Our ability to model and predict the rate of collisions is based empirically upon only one catastrophic accidental collision event and a model developed on the kinetic theory of gases (KTG). However, clusters of massive objects that have identical inclinations plus similar and overlapping apogees/perigees may indeed have a greater probability of collision than predicted by the KTG-based algorithms as they are not randomly distributed and their orbital element evolution (e.g., change in right ascension of ascending node and argument of perigee) is also similar. It is hypothesized that these similarities could result in resonances of collision dynamics that may lead to larger probability of collision values than predicted with current algorithms. The not well-known fact is that many of the most massive objects are in tightly clumped clusters that will likely produce greater probability of collision than estimated by the KTG approach (see attached paper) and with the much larger consequence (i.e., creation of catalogued LNT fragments). The attached paper that studied this possibility shows some initial indications that this may indeed be true but much more analysis is needed to provide this conclusively. This table of clusters represents well over 50% of the total derelict mass in LEO. However, no one is currently monitoring these potential events. It is proposed that it would be a prudent risk management approach for space flight safety to monitor and characterize this inter-cluster collision risk. The Massive Collision Monitoring Activity (MCMA) is proposed whereby the encounters between members of these clusters are constantly monitored and close encounter information collected, plotted, analyzed, and shared. This would provide a rich research base for scientists and a predictive service for spacefaring countries. I am currently executing a subset of this proposed activity in an ad hoc fashion in conjunction with JSpOC. I have been monitoring the interaction dynamics between the SL-16 population in the 820- 865km altitude region for the last nine months.

#### Collisions with high-value satellites guarantee nuclear escalation.

Egeli 21 [Sitki Egeli is an assistant professor in the Political Science and International Relations Department of Izmir University of Economics. He was previously a director for foreign affairs in Turkey’s Undersecretariat for Defense Industries (SSM) and vice president in charge of the defense and aerospace sectors of an international consulting firm.] “Space-to-Space Warfare and Proximity Operations: The Impact on Nuclear Command, Control, and Communications and Strategic Stability,” Published 25 Jun 2021, <https://www.tandfonline.com/doi/full/10.1080/25751654.2021.1942681>, VM

“Amid increased tensions, perhaps even an imminent military confrontation between **two nuclear-armed adversaries**, a high-value (for example, early-warning or strategic communication) **satellite stops functioning** or communicating **instantly and inexplicably**. SSA sensors do not pick up any anomalies. **This may be the outcome of** a technical malfunction or a natural phenomenon, such as the impact of a collision with a meteoroid or piece of **space debris small enough to have evaded detection**. Alternatively, the satellite perhaps becomes the victim of a deliberate, undetected attack. Earth-to-space kinetic, electronic, or directed energy attacks would leave behind some trails. A cyberattack, which is harder to detect and attribute, is a strong possibility. So is a stealthy attack by hostile spacecraft. In fact, the adversary is known to have experimented with ominous small spacecraft that could easily conceal or disguise themselves until conducting a final maneuver to neutralize their targets. The victim would also be aware that, especially at distant GEO and HEO altitudes, SSA is not sufficiently comprehensive to detect and give warning of all suspicious or threatening movements as they happen. As suspicions abound, decision makers are faced with hard choices. Could this perhaps be the harbinger of a wider nuclear or nonnuclear **first strike**, along with which the attacker is seeking to eliminate the **possibility of retaliation** by degrading the defender’s capacity to command, control, and communicate with its forces? Should the defender react immediately before the remaining space-enabled NC3 elements are also compromised and its control over nuclear and nonnuclear forces degrades even further? In the absence of a clear-cut picture of what actually has happened, there is a risk that impending decisions will be made on the basis of insufficient and potentially **erroneous information**, and the climate will be ripe for unfounded presumptions and predispositions. The resulting ultimatums, responses, or counteractions could **set off a dangerous cycle of escalation** and tit-for-tat actions, whereby reactions and overreactions between adversaries lead to potentially catastrophic consequences. At a minimum, heightened tension in orbit would **have the outcome of spilling down to Earth** so as to further aggravate an already tense situation.?”

## 1AC—Framework

#### The standard is maximizing expected wellbeing.

#### Prefer it:

#### 1] Actor specificity: aggregation – every policy benefits some and harms others, which also means side constraints freeze action.

#### 2] Death is bad and outweighs – agents can’t act if they fear for their bodily security which constrains every ethical theory

#### 3] Intuitions outweigh - since they’re the foundational basis for any argument and theories that contradict our intuitions are most likely false even if we can’t deductively determine why

#### 4] Existential threats outweigh – all life has infinite value and extinction eliminates the possibility for future generations

**GPP 17** (Global Priorities Project, Future of Humanity Institute at the University of Oxford, Ministry for Foreign Affairs of Finland, “Existential Risk: Diplomacy and Governance,” Global Priorities Project, 2017, <https://www.fhi.ox.ac.uk/wp-content/uploads/Existential-Risks-2017-01-23.pdf>,

1.2. THE ETHICS OF EXISTENTIAL RISK In his book Reasons and Persons, Oxford philosopher Derek Parfit advanced an influential argument about the importance of avoiding extinction: I believe that if we destroy mankind, as we now can, this outcome will be much worse than most people think. **Compare three outcomes: (1) Peace. (2) A nuclear war that kills 99% of the world’s existing population. (3) A nuclear war that kills 100%.** (2) would be worse than (1), and (3) would be worse than (2). Which is the greater of these two differences? **Most people believe that the greater difference is between (1) and (2).** **I believe that the difference between (2) and (3) is very much greater**. ... **The Earth will remain habitable for at least another billion years.** **Civilization began only a few thousand years ago.** **If we do not destroy mankind, these few thousand years may be only a tiny fraction of the whole of civilized human history.** **The difference between (2) and (3) may thus be the difference between this tiny fraction and all of the rest of this history.** **If we compare this possible history to a day, what has occurred so far is only a fraction of a second.65** In this argument, it seems that Parfit is assuming that the survivors of a nuclear war that kills 99% of the population would eventually be able to recover civilisation without long-term effect. As we have seen, this may not be a safe assumption – but for the purposes of this thought experiment, the point stands. **What makes existential catastrophes especially bad is that they would “destroy the future,” as** another Oxford philosopher, Nick **Bostrom, puts it.**66 **This future could potentially be extremely long and full of flourishing, and would therefore have extremely large value.** In standard risk analysis, when working out how to respond to risk, we work out the expected value of risk reduction, by weighing the probability that an action will prevent an adverse event against the severity of the event. **Because the value of preventing existential catastrophe is so vast, even a tiny probability of prevention has huge expected value.**67 Of course, there is persisting reasonable disagreement about ethics and there are a number of ways one might resist this conclusion.68 Therefore, it would be unjustified to be overconfident in Parfit and Bostrom’s argument. **In some areas, government policy does give significant weight to future generations.** For example, in assessing the risks of nuclear waste storage, governments have considered timeframes of thousands, hundreds of thousands, and even a million years.69 Justifications for this policy usually appeal to principles of intergenerational equity according to which future generations ought to get as much protection as current generations.70 Similarly, widely accepted norms of sustainable development require development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs.71 **However, when it comes to existential risk, it would seem that we fail to live up to principles of intergenerational equity.** **Existential catastrophe would not only give future generations less than the current generations; it would give them nothing.** Indeed, **reducing existential risk plausibly has a quite low cost for us in comparison with the huge expected value it has for future generations.** In spite of this, relatively little is done to reduce existential risk. **Unless we give up on norms of intergenerational equity, they give us a strong case for significantly increasing our efforts to reduce existential risks.** 1.3. WHY EXISTENTIAL RISKS MAY BE SYSTEMATICALLY UNDERINVESTED IN, AND THE ROLE OF THE INTERNATIONAL COMMUNITY **In spite of the importance of existential risk reduction, it probably receives less attention than is warranted.** As a result, concerted international cooperation is required if we are to receive adequate protection from existential risks. 1.3.1. Why existential risks are likely to be underinvested in **There are several reasons why existential risk reduction is likely to be underinvested in.** **Firstly, it is a global public good.** **Economic theory predicts that such goods tend to be underprovided.** **The benefits of existential risk reduction are widely and indivisibly dispersed around the globe from the countries responsible for taking action.** Consequently, a country which reduces existential risk gains only a small portion of the benefits but bears the full brunt of the costs. Countries thus have strong incentives to free ride, receiving the benefits of risk reduction without contributing. As a result, too few do what is in the common interest. **Secondly**, as already suggested above, **existential risk reduction is an intergenerational public good: most of the benefits are enjoyed by future generations who have no say in the political process.** **For these goods, the problem is temporal free riding: the current generation enjoys the benefits of inaction while future generations bear the costs. Thirdly**, many **existential risks**, such as machine superintelligence, engineered pandemics, and solar geoengineering, **pose an unprecedented and uncertain future threat.** Consequently, it is hard to develop a sati sfactory governance regime for them: there are few existing governance instruments which can be applied to these risks, and it is unclear what shape new instruments should take. In this way, our position with regard to these emerging risks is comparable to the one we faced when nuclear weapons first became available. **Cognitive biases also lead people to underestimate existential risks.** **Since there have not been any catastrophes of this magnitude, these risks are not salient to politicians and the public.**72 This is an example of the misapplication of the availability heuristic, a mental shortcut which assumes that something is important only if it can be readily recalled. **Another cognitive bias affecting perceptions of existential risk is scope neglect.** In a seminal 1992 study, three groups were asked how much they would be willing to pay to save 2,000, 20,000 or 200,000 birds from drowning in uncovered oil ponds. The groups answered $80, $78, and $88, respectively.73 In this case, the size of the benefits had little effect on the scale of the preferred response. **People become numbed to the effect of saving lives when the numbers get too large.** 74 **Scope neglect is a particularly acute problem for existential risk because the numbers at stake are so large.** **Due to scope neglect, decision-makers are prone to treat existential risks in a similar way to problems which are less severe by many orders of magnitude.** A wide range of other cognitive biases are likely to affect the evaluation of existential risks.75

#### 5] Moral uncertainty means extinction comes first

**Pummer 15** [Theron, Junior Research Fellow in Philosophy at St. Anne's College, University of Oxford. “Moral Agreement on Saving the World” Practical Ethics, University of Oxford. May 18, 2015] AT

**There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now**, whatever general moral view we adopt**: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war.** How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that **we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world.** According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. **Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here.** If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how **reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people.** Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, **this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake.** **Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don’t matter.** Even John Rawls wrote, “**All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.**” **Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view.** **They’d thus imply very strong reasons to reduce existential risk**, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. **Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk.** It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). **To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being.** To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – **suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being**, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But **once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk.** Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. **We should also take into account moral uncertainty.** **What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts?** I’ve just argued that **there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree.** But **even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one** (and 10% sure that one of these other ones is correct), **they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk.** Perhaps most disturbingly still, **even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the wor**

**ld.** Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. **It is enough for my claim that there is moral agreement in the relevant sense if**, at least given certain empirical claims about what future lives would most likely be like, **all minimally plausible moral views would converge on the conclusion that we should try to save the world.** While there are some non-crazy **views that place significantly greater moral weight on avoiding suffering than on promoting happiness**, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless **seem to be fairly implausible views.** And **even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve.** Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. **Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast.** We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. **If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period.** Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. **Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.**” (From chapter 36 of On What Matters)

## 1AC—Method

#### Legal demands are not reformist – it doesn’t conflate change with progress nor validate legal institutions – rather, it’s a contingent intervention that materially reduces violence

Spade 13

Dean Spade, associate professor of law @ Seattle University, “Intersectional Resistance and Law Reform” *Signs* Vol. 38, No. 4, Summer 2013

These critical perspectives suggest a very different method for analyzing American law, one that departs from the questions that lawyers and legal scholars, who are often engaged in single-axis thinking about systems of subjection, might ask. Those inquiries often identify the realm of “equality law” as centered in antidiscrimination and hate crime laws. They often look for places in law where particular groups are named for exclusion or could be named as protected and assume that achieving justice means focusing on reforming those laws. The critical scholars and movements I have been describing instead examine not what the law says about itself but how its operations distribute life chances. They are suspicious of formal declarations of equality and of the idea that legal governmental protections are remedies for violence rather than sources of it. They are vigilant about co-optation, asking whether such declarations have had the material impact promised. Administrative operations occurring in welfare departments, immigration agencies, the Bureau of Indian Affairs, bodies overseeing environmental regulations, departments of corrections, child protective services, and education and taxation systems have been the focus of those who refuse to accept formal legal equality or facial neutrality as the resolution of their claims. Their interventions have asked how these systems are experienced from the perspective of marginalized populations rather than from the perspective of white lawmakers who declare legal systems to be neutral or natural while in reality they center a white propertied male subject. Narrow interventions that purportedly deliver equality have not passed the test when measured against the experiences of people living on the losing end of the distribution of life chances administered by these systems. These critics reject the focus on declarations of equality that often turn out to be mere window dressing for perpetual violence.¶ Genealogies of violence¶ In analyzing purportedly neutral systems to reveal their targeted violence, critics often expose continuities of violence where dominant narratives have declared key historical breaks. National narratives of US history articulate that prior egregious state violences have been resolved, often by civil rights law or other legal reforms. The implicationn is that any existing differences in living conditions among subpopulations in the United States must be a result of merit or lack thereof. Critics contest this story, arguing that while the operations of systems of meaning and control have changed, and while certain technologies of violence have been altered or replaced, the declared breaks are fictions. For example, reproductive justice activists and others have analyzed the child welfare system’s targeting of Black families as an extension of chattel slavery, a system under which family ties between enslaved Black people were violently broken and Black motherhood was constituted as fundamentally different from the valorized white motherhood seen as central to reproducing the nation (Roberts 1993b). Prison abolitionists have argued that the US criminal punishment system is an extension of the racial control of slavery (Hartman 1997; Davis 2003). Their refutation of the purported historical break between slavery and freedom for Black people allows antiprison scholars to analyze criminal punishment very differently than if they saw the problems of the system as utterly separate from the foundational violences of chattel slavery. This viewpoint has fostered recognition that efforts to reform prisons have consistently resulted in the expansion of imprisonment. Often carried out in the name of making prisons more humane, reform results in more and more people—especially Black people, as well as other people of color and poor people—spending more time in prisons overall. The demand for prison abolition is seen as an extension of the unfinished project of abolishing slavery, and the racialized-gendered operations of policing and criminalization are analyzed in relation to their predecessors under slavery.¶ Tracing genealogies of racialized-gendered control and exploitation allows critics to look at purportedly neutral administrative governance in ways that foster very different demands than any single-axis analysis would produce. Such critiques reject the narrative that the US immigration system shed its racism when it abolished Asian-exclusion laws and racial quotas. Instead, immigration enforcement remains racially targeted, is justified through the mobilization of racist images, and perpetuates racialized-gendered nation-making goals: cultivating the life of a white European settler population and maintaining people of color as maximally exploitable and disposable by casting them as threats to that life. Indigenous scholars’ and activists’ refusal to adopt the narrative of the settler state, which seeks to portray the process of genocide and displacement as over or complete, and their constant resistance to ongoing land theft, occupation, attempts at forced assimilation, and erasure all expose the continuity between the supposed bad old days and today. Rejection of civil rights strategies, which seek recognition from and protection of US law, is a necessary element of this analysis, since indigenous scholars and activists have shown that the US government and its legal system are the most significant sources of violence and harm against indigenous people, not forces of protection (Smith 2005; Sharma and Wright 2008–9).¶ These critical inquiries and demands, and their rejection of legal-equality strategies, bring up significant questions about the US nation-state and the role of legal reform in remedying the violences of white supremacy, settler colonialism, heteropatriarchy, and ableism. The methodologies used by the critical traditions I have cited lead to a focus on the targeted violences of purportedly neutral administrative systems and an analysis of how those violences are contiguous with the racialized-gendered property relations that are foundational to the United States (Harris 1996). By invoking the term “population control,” these critical traditions allow us to recognize that the conditions they resist stem from a variety of administrative practices and governing logics that are often mistakenly analyzed separately when single-axis thinking dominates. When those logics and practices are viewed through the genealogies of foundational violences, formal legal change that is primarily symbolic, removing only explicit exclusions or targeting individuals acting with bad intentions, appears severely limited, and deeper questions and demands about fundamental structures of governance emerge.¶ Critical race studies scholarship has described the United States as a racial project (Omi and Winant 1986). The creation of the nation was accomplished through racialization, and racial categories and the United States are mutually constitutive (Harris 1996; Gómez 2007; Willse 2011). The governing capacity of the United States was established through racializing legal mechanisms, including the legal enforcement of a system of chattel slavery; the theft of land and the imposition of legal regimes that established the possibility of ownership for settlers while targeting indigenous people for death and forced assimilation; the establishment of an immigration enforcement system that used racial categories to determine who could become part of the nation; and the establishment of a broad range of social welfare programs that aimed to cultivate white life and distribute education, land, home ownership, and health care in racially targeted ways.9 While immigration, property, social welfare, education, and other programs are no longer allowed to include codified, explicit racial exclusions, their operations are still racialized and racializing.10 Women-of-color feminism, queer-of-color critique, and other critical work on gender and sexuality has helped us understand that the racialization processes that formed the United States and continue to operate under new guises are also always processes that produce, manage, and deploy gender categories and sexuality and family norms.11 The nation-state form itself is produced by the project of gendered-racialized population management.¶ Michel Foucault described this way of thinking about governance by suggesting that what he called “state racism” (2003, 61) is inherent to the project of cultivating the life of the national population. Foucault argued that the most prevalent form of power operating today is power that takes the population as its target, that endeavors, through a variety of means, to cultivate the life of the population and to identify and eliminate threats to and drains on that population. These threats and drains are the subpopulations that must be banished, killed, caged, or abandoned in order to promote the life of the national population (Foucault 2003; Valverde 2007). Perhaps this framework of saving or promoting the life of the national population through the exploitation or death of others is particularly visible in the example of racialized-gendered medical experimentation. Whether we look at the work of the Nazi doctors, the Tuskegee experiment, the intentional spread of infectious diseases to indigenous populations in North America, the widespread practices of medical experimentation on US prisoners, or the long history of forced sterilization of people of color and people with disabilities in the United States, we see the logic that aims to protect and improve the lives of some through exploiting, controlling, or extinguishing the lives of others (Durazo Rojas 2006). This kind of power is operating when state capacities are mobilized to ensure that borders are closed, prisons are locked down, identity documents are checked, and countless other security operations are enforced.¶ In the United States, recent decades have seen internal enemies cast as racialized-gendered figures—drug dealers, criminals, terrorists, illegals, gang members, and welfare queens. The white, propertied settler population must be protected from whatever racialized others are being targeted at the time, and images related to racial classifications, to ideas of foreignness, and to body, ability, gender, and sexuality norms are mobilized to produce these targets. Considering subjection intersectionally, examining purportedly neutral administrative systems to see their targeted violences, and tracing genealogies of racialized population control forces critical scholars and activists dedicated to transforming violent conditions to think broadly about the US legal system and the nation-state form.¶ What intersectional politics demands¶ Social movements using critical intersectional tools are making demands that are often difficult for legal scholars to comprehend because of the ways that they throw US law and the nation-state form into crisis. Because they recognize the fact that legal equality contains and neutralizes resistance and perpetuates intersectional violence and because they identify purportedly neutral administrative systems as key vectors of that violence, critical scholars and activists are making demands that include ending immigration enforcement and abolishing policing and prisons. These demands suggest that the technologies of gendered racialization that form the nation cannot be reformed into fair and neutral systems. These systems are technologies of racialized-gendered population control that cannot operate otherwise—they are built to extinguish perceived threats and drains in order to protect and enhance the livelihood of the national population. These kinds of demands and the analysis they represent produce a different relation to law reform strategies than the national narrative about law reform suggests, and different than what is often assumed by legal scholars interested in the field of “equality law.” Because legal equality “victories” are being exposed as primarily symbolic declarations that stabilize the status quo of violence, declarations from courts or legislatures become undesirable goals. Instead, law reform, in this view, might be used as a tactic of transformation focused on interventions that materially reduce violence or maldistribution without inadvertently expanding harmful systems in the name of reform. One recent example is the campaign against gang injunctions in Oakland

, California. A broad coalition—comprising organizations focused on police violence, economic justice, imprisonment, youth development, immigration, gentrification, and violence against queer and trans people—succeeded in recent years in bringing significant attention to the efforts of John Russo, Oakland’s city attorney, to introduce gang injunctions (Critical Resistance 2011). The organizationsin this coalition are prioritizing anticriminalization work that might usually be cast as irrelevant or marginal to organizations focused on the single axis of women’s or LGBT equality. The campaign has a law reform target in that it seeks to prevent the enactment of certain law enforcement mechanisms that are harmful to vulnerable communities. However, it is not a legal-equality campaign. Rather than aiming to change a law or policy that explicitly excludes a category of people, it aims to expose the fact that a facially neutral policy is administered in a racially targeted manner (Davis 2011; Stop the Injunctions 2011).¶ Furthermore, the coalition frames its campaign within a larger set of demands not limited to what can be won within the current structure of American law but focused on population-level conditions of maldistribution. The demands of the coalition include stopping all gang injunctions and police violence; putting resources toward reentry support and services for people returning from prison, including fully funded and immediate access to identity documents, housing, job training, drug and alcohol treatment, and education; banning employers from asking about prior convictions on job applications; ending curfews for people on parole and probation; repealing California’s three-strikes law; reallocating funds from prison construction to education; ending all collaborations between Oakland’s government and Immigration and Customs Enforcement (ICE); providing affordable and low-income housing; making Oakland’s Planning Commission accountable regarding environmental impacts of development; ending gentrification; and increasing the accountability of Oakland’s city government while augmenting decision-making power for Oakland residents (Stop the Injunctions 2011). These demands evince an analysis of conditions facing vulnerable communities in Oakland (and beyond) that cannot be resolved solely through legal reform since they include the significant harm inflicted when administrative bodies like ICE and the Planning Commission implement violent programs under the guise of neutral rationales. These demands also demonstrate an intersectional analysis of harm and refuse logics of deservingness that have pushed many social movements to distance themselves from criminalized populations. Instead, people caught up in criminal and immigration systems are portrayed as those in need of resources and support, and the national fervor for law and order that has gripped the country for decades, emptying public coffers and expanding imprisonment, is criticized.¶ Another example of intersectional activism utilizing law reform without falling into the traps of legal equality is activism against the immigration enforcement program Secure Communities. Secure Communities is a federal program in which participating jurisdictions submit the fingerprints of arrestees to federal databases for an immigration check. As of October 2010, 686 jurisdictions in thirty-three states were participating.12 Diverse coalitions of activists and organizations around the United States launched organizing campaigns to push their jurisdictions to refuse to participate. Organizations focused on domestic violence, trans and queer issues, racial and economic justice, and police accountability, along with many others, have joined this effort and committed resources to stopping the devolution of criminal and immigration enforcement. Their advocacy has rejected deservingness narratives that push the conversation toward reform for “good, noncriminal” immigrants. These advocates have won significant victories, convincing certain jurisdictions to refuse to participate and increasing understanding of the intersecting violences of criminal punishment and immigration enforcement.13 This work also avoids the danger of expanding and legitimizing harmful systems that other legal reform work can present. It is focused on reducing, dismantling, and preventing the expansion of harmful systems.14¶ I offer these examples not because they are perfect—certainly a significant range of tactics and strategies are part of each of these campaigns, and, with detailed analysis, we might find instances of co-optation, deservingness divides, and other dangers of legal reform work occurring even as some are avoided and rejected. However, these examples are indicative of resistance to limitations of legal equality or rights strategies. These demands exceed what the law recognizes as viable claims. These campaigns suggest that those who argue that a politics based on intersectional analysis is too broad, idealistic, complex, or impossible—or that it eliminates effective immediate avenues for resistance—are mistaken. Critical political engagements are resisting the pitfalls of rights discourse and seeking to build broad-based resistance formations made up of constituencies that come from a variety of vulnerable subpopulations but find common cause in concerns about criminalization, immigration, poverty, colonialism, militarism, and other urgent conditions. Their targets are administrative systems and law enforcement mechanisms that are nodes of distribution for racialized-gendered harm and violence, and their tactics seek material change in the lives of vulnerable populations rather than recognition and formal inclusion. Their organizing methods mobilize directly affected communities and value horizontal structures, leadership development, mutual aid, democratic participation, and community solutions rather than top-down, elite-imposed approaches to political transformation. These analytical and practical methods owe a great deal to women-of-color feminist formations that have innovated and continue to lead inquiry and experimentation into transformative social justice theory and practice.15