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#### Interp - “Appropriation of outer space” is exclusive and permanent

TIMOTHY JUSTIN TRAPP, JD Candidate @ UIUC Law, ’13 quoting Smith 92, TAKING UP SPACE BY ANY OTHER MEANS: COMING TO TERMS WITH THE NONAPPROPRIATION ARTICLE OF THE OUTER SPACE TREATY UNIVERSITY OF ILLINOIS LAW REVIEW [Vol. 2013 No. 4]

The issues presented in relation to the nonappropriation article of the Outer Space Treaty should be clear.214 The ITU has, quite blatantly, created something akin to “property interests in outer space.”215 It allows nations to exclude others from their orbital slots, even when the nation is not currently using that slot.216 This is directly in line with at least one definition of outer-space appropriation.217 [\*\*Start Footnote 217\*\*Id. at 236 (“Appropriation of outer space, therefore, is ‘the exercise of exclusive control or exclusive use’ with a sense of permanence, which limits other nations’ access to it.”) (quoting Milton L. Smith, The Role of the ITU in the Development of Space Law, 17 ANNALS AIR & SPACE L. 157, 165 (1992)). \*\*End Footnote 217\*\*]The ITU even allows nations with unused slots to devise them to other entities, creating a market for the property rights set up by this regulation.218 In some aspects, this seems to effect exactly what those signatory nations of the Bogotá Declaration were trying to accomplish, albeit through different means.219

#### Violation: the non-Appropriation principle does not apply to resource extraction. International consensus and rejection of the Moon Treaty support the distinction between sovereign ownership and resource extraction

Wrench 19 [John, JD Candidate at Case Western, BA from Pace University] “Non-Appropriation, No Problem: The Outer Space Treaty Is Ready for Asteroid Mining,” Case Western Reserve Journal of International Law, Vol. 51 Issue 1, <https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=2546&context=jil>, 2019 RE

An interpretation of Article II supporting a blanket ban on resource ownership is unwarranted by the text of the OST and illfounded on account of the international community’s common practices. Scholars have noted that the international community has never questioned whether scientific samples harvested from celestial bodies belong to the extracting nation.60 Furthermore, space-faring members of the international community rejected the Moon Treaty precisely because it prohibited all forms of ownership in resources extracted from celestial bodies.61 The space-faring nations’ support for the OST, coupled with their rejection of an alternative set of rules governing extracted resources, is at the very least an indication of what those nations believe the non-appropriation principle to stand for.

It is equally improbable that the international community drafted the non-appropriation principle to be merely idealistic rhetoric. The OST leaves no room for interpretations to squirm out from under its ban on sovereign claims of land.62 The following section illustrates, however, that the distinction between sovereign ownership of land, and the vestment of property rights in resources extracted from that land, is nothing new.

#### Prefer:

#### 1] Precision--analogous treaties prove

Wrench 19 [John, JD Candidate at Case Western, BA from Pace University] “Non-Appropriation, No Problem: The Outer Space Treaty Is Ready for Asteroid Mining,” Case Western Reserve Journal of International Law, Vol. 51 Issue 1, <https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=2546&context=jil>, 2019 RE

Although the OST does not provide a comprehensive guideline for resource extraction in outer space, its foundational logic provides a workable distinction between ownership and use. This part explores three property regimes developed under the same fundamental constraints as the non-appropriation principle: the United Nations Convention on the Law of the Sea (“UNCLOS”), the Antarctica Treaty System, and the prior appropriation doctrine as applied in United States water law.63 Under each regime, parties may establish some form of ownership in extracted resources despite being restricted from claiming sovereignty over the underlying land.

#### Consensus of the literature votes neg—means our interp is most predictable

Tronchetti 10 [Fabio, Co-Director of the Institute of Space Law and Strategy and as a Zhuoyue Associate Professor at Beihang University, PhD in International Space Law from Leiden University] “The Moon Agreement in the 21st Century: Addressing its Potential Role in the Era of Commercial Exploitation of the Natural Resources of the Moon and Other Celestial Bodies,” Journal of Space Law, Vol. 36 No. 2, Winter 2010, <https://airandspace.confit.dev/pdfs/jsl-36-2.pdf> RE

A key issue, which is not directly addressed by the Treaty and which is of fundamental relevance for the present discussion, concerns the use of outer space resources. In this respect, the main question is whether or not the prohibition on appropriation of outer space is also applicable to its resources. No clear-cut answer can be provided based on the current legal framework. While some authors express the view that the restriction in Article II applies equally to outer space and its resources,28 others, the majority, argue that by analogy with the rules regulating the freedom of the high seas,29 the appropriation of space resources merely forms part of the freedom of exploration and use of outer space.30 This paper shares the opinion of the second group of authors.

#### That o/w any deviation justifies the aff arbitrarily jettisoning words in the resolution at their whim which decks negative ground and preparation because the aff is no longer bounded by the resolution.

#### 2] limits and ground: expanding the topic beyond appropriation allows for affs about any miniscule use of space resources which decimates links to generics which are based on property rights in space and results in a litany of small affirmatives that cause a race to the margins

#### Topicality is a voting issue that should be evaluated through competing interpretations – it tells the negative what they do and do not have to prepare for

#### No RVIs—it’s your burden to be topical.

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#### Commercial asteroid mining is coming now – lower costs and improving tech make it economically viable – and the legal basis is already in place in multiple countries– that helps acquire water for rocket fuel and rare earth metals

Gilbert, PhD student in space resources at the Colorado School of Mines, writes in 21 alex gilbert, is a complex systems researcher and a PhD student in space resources at the Colorado School of Mines. "Mining in Space Is Coming." Milken Institute Review, April 26, 2021, [www.milkenreview.org/articles/mining-in-space-is-coming](http://www.milkenreview.org/articles/mining-in-space-is-coming). [Quality Control]

Space exploration is back. after decades of disappointment, a combination of better technology, falling costs and a rush of competitive energy from the private sector has put space travel front and center. indeed, many analysts (even some with their feet on the ground) believe that commercial developments in the space industry may be on the cusp of starting the largest resource rush in history: mining on the Moon, Mars and asteroids.

While this may sound fantastical, some baby steps toward the goal have already been taken. Last year, NASA awarded contracts to four companies to extract small amounts of lunar regolith by 2024, effectively beginning the era of commercial space mining. Whether this proves to be the dawn of a gigantic adjunct to mining on earth — and more immediately, a key to unlocking cost-effective space travel — will turn on the answers to a host of questions ranging from what resources can be efficiently.

As every fan of science fiction knows, the resources of the solar system appear virtually unlimited compared to those on Earth. There are whole other planets, dozens of moons, thousands of massive asteroids and millions of small ones that doubtless contain humungous quantities of materials that are scarce and very valuable (back on Earth). Visionaries including Jeff Bezos imagine heavy industry moving to space and Earth becoming a residential area. However, as entrepreneurs look to harness the riches beyond the atmosphere, access to space resources remains tangled in the realities of economics and governance.

Start with the fact that space belongs to no country, complicating traditional methods of resource allocation, property rights and trade. With limited demand for materials in space itself and the need for huge amounts of energy to return materials to Earth, creating a viable industry will turn on major advances in technology, finance and business models.

That said, there’s no grass growing under potential pioneers’ feet. Potential economic, scientific and even security benefits underlie an emerging geopolitical competition to pursue space mining. The United States is rapidly emerging as a front-runner, in part due to its ambitious Artemis Program to lead a multinational consortium back to the Moon. But it is also a leader in creating a legal infrastructure for mineral exploitation. The United States has adopted the world’s first spaceresources law, recognizing the property rights of private companies and individuals to materials gathered in space.

However, the United States is hardly alone. Luxembourg and the United Arab Emirates (you read those right) are racing to codify space-resources laws of their own, hoping to attract investment to their entrepot nations with business-friendly legal frameworks. China reportedly views space-resource development as a national priority, part of a strategy to challenge U.S. economic and security primacy in space. Meanwhile, Russia, Japan, India and the European Space Agency all harbor space-mining ambitions of their own. Governing these emerging interests is an outdated treaty framework from the Cold War. Sooner rather than later, we’ll need new agreements to facilitate private investment and ensure international cooperation.

What’s Out There

Back up for a moment. For the record, space is already being heavily exploited, because space resources include non-material assets such as orbital locations and abundant sunlight that enable satellites to provide services to Earth. Indeed, satellite-based telecommunications and global positioning systems have become indispensable infrastructure underpinning the modern economy. Mining space for materials, of course, is another matter.

In the past several decades, planetary science has confirmed what has long been suspected: celestial bodies are potential sources for dozens of natural materials that, in the right time and place, are incredibly valuable. Of these, water may be the most attractive in the near-term, because — with assistance from solar energy or nuclear fission — H2O can be split into hydrogen and oxygen to make rocket propellant, facilitating in-space refueling. So-called “rare earth” metals are also potential targets of asteroid miners intending to service Earth markets. Consisting of 17 elements, including lanthanum, neodymium, and yttrium, these critical materials (most of which are today mined in China at great environmental cost) are required for electronics. And they loom as bottlenecks in making the transition from fossil fuels to renewables backed up by battery storage.

#### Asteroid mining offsets terrestrial growth that ruins the environment and enables solar power satellites – both solve climate change

Taylor 19 Chris Taylor is a veteran journalist. Previously senior news writer for Time.com a year later. In 2000, he was named San Francisco bureau chief for Time magazine. He has served as senior editor for Business 2.0, West Coast editor for Fortune Small Business and West Coast web editor for Fast Company. Chris is a graduate of Merton College, Oxford and the Columbia University Graduate School of Journalism. "How asteroid mining will save the Earth — and mint trillionaires." Mashable, 2019, mashable.com/feature/asteroid-mining-space-economy. [Quality Control]

The mission is essential, Joyce declares, to save Earth from its major problems. First of all, the fictional billionaire wheels in a fictional Nobel economist to demonstrate the actual truth that the entire global economy is sitting on a mountain of debt. It has to keep growing or it will implode, so we might as well take the majority of the industrial growth off-world where it can’t do any more harm to the biosphere.

Secondly, there’s the climate change fix. Suarez sees asteroid mining as the only way we’re going to build solar power satellites. Which, as you probably know, is a form of uninterrupted solar power collection that is theoretically more effective, inch for inch, than any solar panels on Earth at high noon, but operating 24/7. (In space, basically, it’s always double high noon).

The power collected is beamed back to large receptors on Earth with large, low-power microwaves, which researchers think will be harmless enough to let humans and animals pass through the beam. A space solar power array like the one China is said to be working on could reliably supply 2,000 gigawatts — or over 1,000 times more power than the largest solar farm currently in existence.

“We're looking at a 20-year window to completely replace human civilization's power infrastructure,” Suarez told me, citing the report of the Intergovernmental Panel on Climate Change on the coming catastrophe. Solar satellite technology “has existed since the 1970s. What we were missing is millions of tons of construction materials in orbit. Asteroid mining can place it there.”

The Earth-centric early 21st century can’t really wrap its brain around this, but the idea is not to bring all that building material and precious metals down into our gravity well. Far better to create a whole new commodities exchange in space. You mine the useful stuff of asteroids both near to Earth and far, thousands of them taking less energy to reach than the moon. That’s something else we’re still grasping, how relatively easy it is to ship stuff in zero-G environments.

#### Asteroid mining solves rare earth metal depletion – prevents tech stagnation and unsustainable resource extraction — it would last millions of years which takes out the resource depletion scenario

Mitchell 20 Robin Mitchell is an electronic engineer who has been involved in electronics since the age of 13. After completing a BEng at the University of Warwick, Robin moved into the field of online content creation developing articles. "How might asteroid mining be key to electronics future?" 28-09-2020, [www.electropages.com/blog/2020/09/how-might-asteroid-mining-be-key-electronics-future](http://www.electropages.com/blog/2020/09/how-might-asteroid-mining-be-key-electronics-future). [Quality Control]

As electronics continue to become increasingly more important in everyday life, so is the ability to produce electronic components. With the supply of minerals on Earth having a finite size, some are worried that Earth will soon run out of critical resources such as platinum and lithium. What are asteroids, what are they composed of, and could they be the key to providing humanity with a near-infinite source of minerals?

What minerals are commonly needed for electronics?

Since the introduction of the first commercial circuits, electronics have become incredibly advanced with silicon dies having billions of active components, resistors the size of dust specks, and capacitors that can hold obscene amounts of charge for their size. However, many of these components rely on minerals that most will never have heard of for them to be able to work. Basic components such as resistors and capacitors use common materials including iron, carbon, and aluminium, but components such as LEDs, silicon dies, and thin-film displays use lanthanum, cerium, neodymium, and europium. While many of these minerals fall under the “rare-earth” category, that does not necessarily mean that they are rare; but many are.

Why are these minerals running out?

Minerals that are rare by nature are uncommon in the crust, and mass industrialisation is quickly using up remaining reserves of these minerals. However, it is important to understand what reserve means and how reserves are calculated. Let’s take Uranium as an example to understand this concept better; as things currently stand, there are 80 years of Uranium reserves left. Now, this does not mean that all the uranium will be used up globally in 80 years, this means that at the current price of Uranium, proven sources will continue to supply Uranium at a profitable rate for 80 years. When all reserves are used up, the price for that mineral increases, and this makes areas that used to be unprofitable more profitable, thus generating new reserves.

However, there is another aspect to resources that need to be considered; environmental damage. A good example to demonstrate this is Lithium. While Lithium is rather abundant in the crust, it is spread very wide, making most crust uneconomical to mine. If all cars on earth went electric, the proven reserves of Lithium would run out in 3 years. Of course, new reserves would be made available, and this would extend the ability to use Lithium in industrial practices. However, mining Lithium has a massive environmental impact and sees vast amounts of land destroyed and made toxic due to by-products in the extraction process. The same applies to many rare minerals; many tons of earth is needed to get even the smallest quantity.

What are asteroids, and what are they made of?

Asteroids are small cosmic bodies that orbit a star and can range in size, density, and composition. One of the largest asteroids in the Solar System, Vesta, has a diameter approximately 330 miles, while some of the smallest can be just two meters across. Asteroids mostly consist of rock as well as minerals, but their exact composition greatly varies. For example, M-type asteroids are those that mostly consist of nickel-iron, while C-type asteroids consist of clay and silicate rocks. Other minerals that are often found in asteroids include gold, cobalt, palladium, platinum, and osmium.

Could asteroid mining be the key to ensuring limitless supplies?

While asteroids themselves may contain trace amounts of rare minerals, their size and lack of an ecosystem would allow for a mining operation to destroy an entire asteroid with no repercussions. Asteroids are also plentiful in the Solar System, and would most likely provide humanities resource needs for millions of years. For perspective, the total weight of the asteroid belt is only 3% that of the moon, but that is still 2.39×1021 kilograms. Even then, that is only the asteroid belt and does not consider stray asteroids that orbit the sun, planets, and rings around Saturn / Jupiter.

#### Asteroid mining tech solves asteroid collisions - extinction

Taylor 19 Chris Taylor is a veteran journalist. Previously senior news writer for Time.com a year later. In 2000, he was named San Francisco bureau chief for Time magazine. He has served as senior editor for Business 2.0, West Coast editor for Fortune Small Business and West Coast web editor for Fast Company. Chris is a graduate of Merton College, Oxford and the Columbia University Graduate School of Journalism. "How asteroid mining will save the Earth — and mint trillionaires." Mashable, 2019, mashable.com/feature/asteroid-mining-space-economy. [Quality Control]

For those who worry about asteroids that could wipe out civilization — though luckily, this isn't likely to happen any time soon — here is a way for humanity to get proficient in moving them out of the way, fast. Indeed, the National Space Society has offered a proposal to capture the asteroid Aphosis (which is set to miss Earth in the year 2029, but not by a very comfortable margin), keep it in orbit, and turn it into 150 small solar-power satellites, as a proof of concept.

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#### CP: States should create and adopt a new set of flexible regulations concerning responsible space colonization through the UN Office of Outer Space Affairs. The appropriation of outer space through asteroid mining by private entities should be regulated by the UN Office of Outer Space Affairs.

#### Current government issues to resolve colony governance are insufficient – as is the OST – but new flexible regulations solve

Kovic 21 Kovic, Marko. PhD Communication and Media Studies, University of Zurich. "Risks of space colonization." Futures 126 (2021): 102638. [Quality Control]

Overall, it seems fair to say that space governance is in shambles today. Creating any kind of meaningful space colonization-related governance in such a policy and policymaking environment is difficult, to say the least. We should not expect governance work on space colonization be initiated by gov-ernmental actors any time soon, so the proverbial ball is, at the time being,probably in the academic court. If we were to draft a space colonization gov-ernance framework that would be effective at mitigating colonization-relatedrisks and maximize the positive future value, what are some factors or aspects that need to be taken into account? First, we should consider a break with the past. Existing space gover-nance based on the Outer Space Treaty has barely seen any progress over the decades, and the Outer Space Treaty does not seem geared towards questions of space colonization risks. Starting with a philosophical clean slate that is divorced from the realities of the 1960-ies is probably the easiest way forward. Second, given the uncertainty of the long-term future, a governance frame-work for space colonization should be conceptualized as provisional and mal-leable. Major principles of safe space colonization might very well be uni-versal, but the empirical realities on the ground might change in the nottoo distant future. This means that, on one hand, our understanding of space colonization-related risks will almost certainly change over time. The practical reality of policymaking on Earth, on the other hand, will probably also undergo significant changes in the future. The current political order on Earth has been, roughly speaking, stable since the Second World War, and it seems plausible to expect the global political order to roughly continue along those lines for several more decades. This means that any governance frame-work that is geared towards today’s workings of global policymaking should daim to achieve tangible results as soon as possible, before the world changesso much that the governance framework and its bodies simply become obso-lete. The philosophical timescale of such a governance project thousands tomillions of years, but the practical timescale for achieving results should be decades.

**1AC Foster agrees that regulation through an international agreement is all that’s necessary to solve their space war advantage – it says nothing about banning being key. -- im in green**

**Foster 16** – Craig, J.D., University of Illinois College of Law, “EXCUSE ME, YOU’RE MINING MY ASTEROID: SPACE PROPERTY RIGHTS AND THE U.S. SPACE RESOURCE EXPLORATION AND UTILIZATION ACT OF 2015”, *JOURNAL OF LAW, TECHNOLOGY & POLICY*, No. 2, page 428-430, http://illinoisjltp.com/journal/wp-content/uploads/2016/11/Foster.pdf

There are many reasons to be excited about the prospect of mining resources from space. Hopes are high **that these mining efforts will provide an economic boon by producing jobs and injecting more money into the economy. 214 Additionally, the negative impact of mining natural resources on Earth is widely reported215 and might be mitigated by space mining. If mining precious resources from space can minimize the burden on Earth, then this would lend even greater support for asteroid mining. Finally, little enchants the human mind and propels innovation more than sending people and manmade objects into space. For good reason, there is much enthusiasm about the prospect of space mining. On the other hand, it is troublesome to some that private, commercial entities will be paving the way and making up many of the rules as they go. Might this lead to repeating many of the mistakes humans have made on Earth? Might there be unforeseen problems that could spell trouble if mining efforts are not** properly regulated**? The answer to these questions is likely “yes” as well. It will be important in the coming years to balance the former excitement against the latter** caution. Space might seem limitless and impossible to affect in any significant fashion; but, history must be a major voice for the spacemining industry.216 **It must be remembered that humans can make an impact that will be felt for generations to come**. Thus, **it will be important that lawmakers and the international community be as proactive as possible**—**both in outlining property rights and protecting the final frontier from being harmed by an industry that might become overzealous** if left unchecked. **Specifically, it will be vital for countries to enter into some sort of international agreement**. One option is to create an agreement similar to UNCLOS, which would regulate how individual states and their citizens interact with resources mined from space**.217 Such an agreement should recognize not only the property rights of the extracting commercial entities but also the rights of non-spacefaring countries to benefit from the minerals as well. This might include the creation of an international body, much like the ISA, that will ensure that the interests of all nations are maintained by distributing funds and technology to less wealthy or non-sp**acefaring nations. **The U.S. would do well to help create and ratify such an agreement**— something they have failed to do with UNCLOS. If the U.S. and other countries are uneasy about entering into such a restrictive agreement, **they might also consider an international regulatory body** and scheme much **like the one used for satellites. The International Telecommunications Union (ITU) is a United Nations agency that, among other services, provides the international community with uniform satellite orbit oversight and regulatory guidance.218 Currently, 193 countries** follow the ITU regulations and utilize their services, which have been likened to domain name registration.219 In the **same way, spacefaring countries could form an international body that helps create and maintain a uniform space-mining legal framework.220 Without** some sort **of international framework as described above, the U.S. and other space-mining countries leave themselves open to great conflict and will be required to patch together a multitude of treaties between themselves as problems inevitably arise.221 V. CONCLUSION The idea of mining resources from celestial bodies is something that has always been relegated to video games and sci-fi movies. But as technology continues to progress at an exponential rate, such mining is starting to come within the realm of possibility. A number of companies are currently creating prospecting technologies** that will allow them to determine exactly what an individual asteroid holds. They hope to eventually harvest these resources and sell them for lucrative profits. Fortunately for these companies, **the current legal regime governing property rights to space resources is undergoing rapid change at the national level. The U.S. recently passed the Space Resource Exploration and Utilization Act of 2015, which explicitly entitles U.S. citizens to property rights over any space resources they obtain. This is certain to induce confidence in U.S. investors. The situation at the international level is different. Current international space agreements are vague, lacking in consensus, and provide little precedent for ownership of space resources. This has led the international** community to move in the direction of creating a better regulatory framework, but this **movement is still in discussion stages and is likely to take a while to come to fruition**.

**1AC Mallick evidence also says the problem is lack of global consensus and clarity, not the existence of asteroid mining which they cant solve because they just ban mining they dont fiat in an intnl organization or body. -- im in green**

**Mallick & Rajagopalan 19** - Law Researcher at the High Court of Delhi from 2016 to 2018 and is currently pursuing LL.M in International Law at The Fletcher School of Law and Diplomacy, USA, \*\*Distinguished Fellow and Head of the Nuclear and Space Policy Initiative at Observer Research Foundation. She is also the Technical Adviser to the UN Group of Governmental Experts (GGE) on Prevention of Arms Race in Outer Space (PAROS). (Rajeswari Pillai Rajagopalan, Senjuti Mallick, “If Space is ‘the Province of Mankind’, Who Owns its Resources? The Potential of Space Mining and its Legal Implications”, ORF Occasional Paper No. 182, January 2019, Observer Research Foundation., <https://www.orfonline.org/research/if-space-is-the-province-of-mankind-who-owns-its-resources-47561/>) NAR

**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, bef**ittingly 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 en**sure 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**.

# CASE

### Inherency

**1AC evidence concedes the plan is already implied in the OST – we read green**

**Tronchetti 7**[Fabio Tronchetti is a professor at the International Institute of Air and Space Law, Leiden University, The Netherlands, 2007, <https://iislweb.org/docs/Diederiks2007.pdf>, 12-15-2021 amrita]

ARTICLE II OF THE OUTER SPACE TREATY: A MATTER OF DEBATE The legal content of Article II of the Outer Space Treaty is one of the most debated and analysed topic in the field of space law. Indeed, several interpretations have been put forward to explain the meaning of its provisions. Article II states that: “Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means”. **The text of Article II represents** the final point of a process, formally initiated with Resolution 1721, aimed at conferring to outer space the status of res communis omnium, namely a thing open for the **free exploration** and use by all States **without the possibility of being appropriated**. By prohibiting the possibility of making territorial claims over outer space or any part thereof based on use or occupation, Article II **makes clear that** the customary procedures of **i**nternational **law allowing** subjects to obtain **sovereignty rights over un-owed lands**, namely discovery, occupatio and effective possession, **do not apply to** outer **space.** This prohibition was considered by the drafters of the Outer Space Treaty the best guarantee for preserving outer space for peaceful activities only and for stimulating the exploration and use of the space environment in the name of all mankind. What has been the object of controversy among legal scholars is the question of whether both States and private individuals are subjected to the provisions of Article II. Indeed, **while Article II forbids** expressis verbis the national **appropriation by** claims of **sovereignty**, by means of use and occupation or other means of outer space, **it does not** make **a**ny explicit **mention** **to** its **private** appropriation. Relying on this consideration, some authors have argued that the private appropriation of outer space and celestial bodies is allowed. For instance, in 1968 Gorove wrote: “Thus, at present an individual acting on his own behalf or on behalf of another individual or private association or an international organisation could lawfully appropriate any parts of outer space…”6 . The same argument is used today by the enterprises selling extraterrestrial acres. They base their claim to the Moon and other celestial bodies on the consideration that Article II does not explicitly forbid private individuals and enterprises to claim, exploit or appropriate the celestial bodies for profit7 . However, it must be said, that nowadays there is a general consensus on the fact that **both national appropriation and private** property rights **are denied** under the Outer Space Treaty. Several way of reasoning have been advanced to support this view. Sters and Tennen affirm that the argument that Article II does not apply to private entities since they are not expressly mentioned fails for the reason that they do not need to be explicitly listed in Article II to be fully subject to the non-appropriation principle8 . **Private entities are allowed to carry out** space **activities but**, according to Article VI of the Outer Space Treaty, they **must be authorized** to conduct such activities **by the** appropriate **State** of nationality. But if the State is prohibited from engaging in certain conduct, then it lacks the authority to license its nationals or other entities subject to its jurisdiction to engage in that prohibited activity. Jenks argues that “States bear international responsibility for national activities in space; it follows that what is forbidden to a State is not permitted to a chartered company created by a State or to one of its nationals acting as a private adventurer”9 . It has been also suggested that **the prohibition of national** appropriation **implies prohibition of private** appropriation because the latter cannot exist independently from the former10. In order to exist, indeed, private property requires a superior authority to enforce it, be in the form of a State or some other recognised entity. In outer space, however, this practice of State endorsement is forbidden. Should a State recognise or protect the territorial acquisitions of any of its subjects, this would constitute a form of national appropriation in violation of Article II. Moreover, it is possible to use some historical elements to support the argument that both the acquisition of State sovereignty and the creation of private property rights are forbidden by the words of Article II. During the negotiations of the Outer Space Treaty, the Delegate of Belgium affirmed that his delegation “had taken note of the interpretation of the non-appropriation advanced by several delegations-apparently without contradiction-as covering both the establishment of sovereignty and the creation of titles to property in private law”11. The French Delegate stated that: “…there was reason to be satisfied that three basic principles were affirmed, namely: the prohibition of any claim of sovereignty or property rights in space…”12. The fact that the accessions to the Outer Space Treaty were not accompanied by reservations or interpretations of the meaning of Article II, it is an evidence of the fact that this issue was considered to be settled during the negotiation phase. Thus, summing up, we may say that **prohibition of appropriation of outer space** and its parts is a rule which **is valid for both private and public entity**. The theory that private operators are not subject to this rule represents a myth that is not supported by any valid legal argument. Moreover, it can be also added that if any subject was allowed to appropriate parts of outer space, the basic aim of the drafters of the Treaty, namely to prevent a colonial competition in outer space and to create the conditions and premises for an exploration and use of outer space carried out for the benefit of all States, would be betrayed. Therefore, **the need to protect the non-appropriative nature o**f outer **space emerges** in all its relevance.

### Resource Depletion

#### 1] intl link is about governments - us china — cant solve - their scenario is about the U.S. mining is bad which the plan doesnt ban so fill in inevitable

#### 2] Overreliance —evidence says we'd run out in hundreds of years 3] Resources shortages nuq — ings is descriptive of terrestrial mining and how the U.S. is reliant so the US would have to go to war either way

#### No correlation between resources and war

Atkins, 16—PhD Candidate in Energy, Environment & Resilience at the University of Bristol (Ed, “Environmental Conflict: A Misnomer?,” <http://www.e-ir.info/2016/05/12/environmental-conflict-a-misnomer/>, dml)

The economic and strategic importance of oil and other non-renewable resource is indisputable. Yet the globalised character of international commerce has resulted in many nations ceasing to perceive resource dependency as a threat to autonomy or survival (Deudney, 1990). This interdependence has resulted in the decreased likelihood of inter-state conflict over control of resources, due to the price shocks these actions could propel across the system and the increasingly technological developments (Lipschutz and Holdren, 1990). Such dynamics are well illustrated by the 1973 oil crisis (Dabelko and Dabelko, 1993). Although the move by the Organisation of Arab Petroleum Exporting Countries (OAPEC) to restrict exports resulted in record price rises and the transformation of the international sphere, thus illustrating the economic relevance of resources, it did not result in international violent conflict. Furthermore, Le Billon (2001) has stated that the spectre of resource scarcity has resulted in the escalation of socioeconomic innovation and economic diversification – with the market mechanisms of contemporary capitalism creating an important impediment to conflict. In Botswana and Norway, minerals and oil, respectively, have been mobilised to ensure peaceful development rather than violent confrontation (Le Billon, 2001). Furthermore, in many cases potential scarcity has resulted in increased inter-state cooperation due to the shared interest in continued supply. The continued sanctity of the 1960 Indus Waters Treaty, between Pakistan and India, is an important example, with the spirit of cooperation over water resources enduring despite increased political tensions between the two nations (Wolf, 1998).

#### No resource wars

Dr. Emily Meierding 16, PhD, Assistant Professor at the Naval Postgraduate School, 5/19/16, “Oil Wars: Why Nations Aren’t Battling Over Resources”, Washington Post, https://www.washingtonpost.com/news/monkey-cage/wp/2016/05/19/oil-wars-why-nations-arent-battling-over-petroleum-resources/

When China’s Haiyang Shiyou 981 oil rig sailed into waters off the Paracel Islands in May 2014, it provoked an international crisis. Hanoi insisted that the rig was operating illegally in Vietnamese territory. Both countries sent naval and fishing vessels to enforce their claims. Commentators predicted that the two states might come to blows.

The confrontation died down, but a critical question remains: Do countries fight over oil resources?

The question isn’t just pertinent to the South China Sea. The Arctic, Caspian, East China Sea and eastern Mediterranean have all been identified as potential “hot spots” for international oil conflicts. Numerous conflicts, including Iraq’s invasion of Kuwait, Japan’s invasion of the Dutch East Indies in World War II, Germany’s attacks against the Russian Caucasus in the same war, the Iran-Iraq War, the Chaco War between Bolivia and Paraguay, and even the Falklands War, have been described as international “oil wars.”

However, contrary to the conventional wisdom, the risk of international oil wars is slim. Although oil is an exceptionally valuable strategic and economic resource, fighting for it does not pay. The belief that countries fight for oil rests on a flawed foundational assumption: Countries reap the same benefits from foreign oil resources as from domestic oil resources. In reality, profiting from oil wars is hard.

Countries face at least four sets of obstacles that discourage them from fighting for oil: invasion costs, occupation costs, international costs and investment costs. Invasion costs are the damage that wars inflict on oil fields and infrastructure. Occupation costs arise from local resistance to foreign occupation, which can target oil industry infrastructure and personnel. International costs are imposed by the international community, which can respond to oil grabs with economic sanctions and military interventions. Investment costs are the challenges of attracting foreign capital and technical expertise to occupied oil fields.

Collectively, these four sets of costs dramatically reduce the payoffs

of fighting for oil and the appeal of oil wars. When the many other costs of war, including manpower and materiel, are taken into account, fighting for oil becomes even less attractive. From a purely rational standpoint, countries shouldn’t launch oil wars.

But, countries don’t always act rationally. To test the oil war hypothesis, we have to take another look at historical so-called oil wars.

Closer examination shows that oil has not been the fundamental cause of any international wars. The Falklands War in 1982 was triggered by national pride and Argentine officials’ fear that their window of opportunity for retaking the islands was closing. Rather than fight over oil, Britain and Argentina tried to use it as a catalyst for cooperation. In the 1970s and 1990s, they tried to jointly develop the Falklands’ oil resources.

The Iran-Iraq War, from 1980 to 1988, was also not an oil war. Iraq initially aimed only to gain control over the Shatt al-Arab waterway and 130 square miles of contested territory. In the early stages of the war, Iraq repeatedly offered to withdraw from Iran, if Tehran would accept those demands. However, Iranian officials accused the Iraqis of fighting for oil in order to discredit them internationally.

The Chaco War, from 1932 to 1935, was also launched for other reasons. Bolivia and Paraguay knew that oil discoveries in the Chaco region were unlikely. They fought because of national pride and to avoid further territorial dismemberment, after major losses in the 19th century. The oil explanation didn’t appear until the war bogged down, when leaders tried to transfer responsibility for the devastating conflict onto international oil companies.

On three occasions, countries have launched major military campaigns targeting oil resources. However, these were fundamentally wars for survival, not for oil. In World War II, Japan invaded the Dutch East Indies and Germany attacked the Russian Caucasus because leaders realized that, without more oil, their regimes would collapse. Japan would have to withdraw from China, which was “tantamount to telling us to commit suicide,” as Japanese Foreign Minister Togo Shigenori put it. Hitler was even more succinct: “Unless we get the Baku oil,” he stated, “the war is lost.”

Iraq’s invasion of Kuwait in 1990 was a war for survival. Contrary to popular beliefs, Saddam Hussein was not attempting to greedily grab more oil resources. Instead, he was afraid that the United States was trying to overthrow his regime. The United States had supported the Kurds’ rebellion in the 1970s, perpetrated the Iran-Contra scandal in the 1980s, and by 1990, seemed to be squeezing Iraq economically. According to Hussein, the United States was driving down oil prices by directing Kuwait to exceed its OPEC production quota.

Hussein believed that seizing Kuwait offered the only means of eluding the United States’ hostile designs. By controlling his neighbor, Hussein could raise oil prices, escape his economic crisis and regain domestic support. He knew that the maneuver was a long shot. Regime records show that Hussein expected the United States would try to force him out of Kuwait. Still, it was either that or regime collapse. As Hussein’s deputy, Tariq Aziz, said after the war, “You will either be hit inside your house and destroyed, economically and militarily. Or you go outside and attack…”

Japanese, German and Iraqi leaders believed that they were fighting wars for survival. Participants in other so-called oil wars were fighting for additional reasons, like national pride. None of the conflicts were driven by oil ambitions.

This is good news for contemporary international relations. Oil competition in areas like the South China Sea is not a serious threat to international security. Countries may engage in minor oil spats, like China and Vietnam’s rig confrontation, to reinforce their resource claims. However, these incidents will not escalate into international wars.

There is also little risk of oil imperialism. Countries like China will not satisfy their oil needs by seizing foreign oil fields. Historically, leaders have only initiated oil grabs when they believed that their survival depended on it. This condition is exceedingly rare, even in wartime. And, it’s unrelated to the price of oil. The United States considered grabbing Middle Eastern oil in 1975, after the first energy crisis drove up prices. However, the Ford administration refrained, because the costs of aggression were too high.

Lastly, oil won’t inspire great power wars. The United States and China may eventually come to blows. Some of their military campaigns may target oil resources, if controlling them seems necessary for regime survival. However, oil will not be the fundamental cause of a Sino-American conflict. It’s not worth fighting for.

### Deflection

#### No one ever uses asteroid deflection

Wall 11 - Ph.D. in evolutionary biology from the University of Sydney, Australia

Mike Wall, “Why Asteroids Make Lousy Space Weapons,” Space.com, November 4, 2011, <https://www.space.com/13515-asteroid-deflection-space-weapons.html>.

If you lie awake at night worrying about some supervillain steering giant asteroids toward your hometown, you really should relax, experts say. It's not going to happen anytime soon.

Humanity does indeed have the technical skills to move space rocks around, and we may employ this know-how at some point to avoid a catastrophic impact like the one that killed the dinosaurs 65 million years ago. But the odds of any rogue state using asteroids to rain death down on its enemies are minuscule, experts say.

"It's a lousy weapon," said former astronaut Rusty Schweickart, chairman of the B612 Foundation, a group dedicated to predicting and preventing cataclysmic asteroid impacts on Earth.

"You get a chance to use one once every several hundred years," Schweickart said during a recent panel discussion called "Moving an Asteroid" at the California Institute of Technology in Pasadena. "And even then, you can only deflect it to hit someplace along a sort of arbitrary line across the Earth." [Top 10 Space Weapons]

Serious spaceflight skills

Changing the orbit of a massive asteroid hurtling through deep space sounds like a daunting task, but our species knows how to do it.

For example, we could launch a spacecraft that would rendezvous with an asteroid, then travel alongside it for months or years. Over time, the probe's modest gravity would tug on the space rock, pulling it into a different orbit, Schweickart said.

Given enough time to act, this so-called "gravity tractor" method could work in quite precise and predictable ways. And we've demonstrated the skills necessary to make it happen.

Multiple missions have met up with asteroids in deep space. For example, NASA's Dawn spacecraft is currently in orbit around Vesta, the second-largest object in the main asteroid belt between Mars and Jupiter.

And in 2005, Japan's Hayabusa probe rendezvoused with a space rock called Itokawa. The craft even scraped some samples off Itokawa and sent them back to Earth for analysis.

It's a good thing we possess these potential asteroid-moving skills, Schweickart said, for they may save our bacon someday.

Earth has been pummeled by many dangerous asteroids throughout its history, and there's no reason to think the barrage will stop in the future. Space rocks big enough to cause major damage and disruption to the global economy and society (were they to strike a populated area today) have hit Earth, on average, every 200 or 300 years, Schweickart said.

Firing a weapon once every 300 years

That bombardment rate is scarily frequent to anyone worried about the long-term survival of human civilization. But it's not nearly frequent enough to make asteroids good weapons of mass destruction, according to Schweickart. [5 Reasons to Care About Asteroids]

"You're going to have an opportunity once every two or three hundred years to go up and have a weapon to hit Baghdad," Schweickart said. "Of course, the problem is that by that time, the Zambian space program is the world's premier space program, and Baghdad is a buddy of yours."

Potential asteroid wranglers also wouldn't be able to direct a space rock just anywhere on Earth, he added. For the foreseeable future, we'll be able only to speed up or slow down an asteroid, moving it in an "east-west" direction along its trajectory. Moving it in the "north-south" plane is not an option.

"If you do anything other than speed up or slow down the asteroid, it has almost no effect," Schweickart said. "You've got to go along that line; it's the only way physics lets you do it."

So anyone wishing to asteroid-bomb the United States would have to manipulate a space rock whose trajectory already crossed American territory. The trick would be tweaking its velocity enough to ensure an impact on American soil.

In practice, therefore, the wait for a suitable asteroid weapon could be considerably longer than 200 or 300 years.

Protecting Earth

Schweickart and other panelists argued that humanity will need to deflect a killer asteroid away from Earth someday. It would be a shame, they said, if unfounded fears about possible nefarious uses of asteroid-moving technology impeded its development.

"The public perception of asteroids can be pretty scary," Schweickart said. "There's going to be a lot of scare stuff. It's already out there, it's going to get worse and that is going to be a very serious challenge that we on the technical side will have to deal with."

People worried about death from above should focus their anxiety elsewhere, fellow panelist Bill Nye said. There are plenty of much more viable space weapons than asteroids already up there.

"Space is already pretty weaponized," said Nye, executive director of the Planetary Society and former host of the science-themed TV show "Bill Nye the Science Guy." "The global positioning system that we all know and love was designed to guide weapons. So using an asteroid as a weapon is sort of coming late to the party."

### Debris

#### Impact evidence does not say it would escalate just that military capabilities would be a bit weaker

#### No credible scenario for extinction—outdated fringe science and well-meaning threat inflation — no new 2nr impact

**Scouras 19** (James Scouras, Johns Hopkins University Applied Physics Laboratory, formerly served on the congressionally established Comission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack, “Nuclear War as a Global Catastrophic Risk”, Cambridge Core, 9-2-2019, available at https://www.cambridge.org/core/journals/journal-of-benefit-cost-analysis/article/nuclear-war-as-a-global-catastrophic-risk/EC726528F3A71ED5ED26307677960962, accessed 12-1-2019, HKR-cjh)

**\*footnotes 2 and 4 included**

It might be thought that we know enough about the risk of nuclear war to appropriately manage that risk. The consequences of unconstrained nuclear attacks, and the counterattacks that would occur until the major nuclear powers exhaust their arsenals, would far exceed any cataclysm humanity has suffered in all of recorded history. The likelihood of such a war must, therefore, be reduced as much as possible. But **this rather simplistic logic raises many questions and does not withstand close scrutiny.** Regarding consequences, does unconstrained nuclear war pose an existential risk to humanity? The consequences of existential risks are truly incalculable, including the lives not only of all human beings currently living but also of all those yet to come; involving not only Homo sapiens but all species that may descend from it. At the opposite end of the spectrum of consequences lies the domain of “limited” nuclear wars. Are these also properly considered global catastrophes? After all, while the only nuclear war that has ever occurred devastated Hiroshima and Nagasaki, it was also instrumental in bringing about the end of the Pacific War, thereby saving lives that would have been lost in the planned invasion of Japan. Indeed, some scholars similarly argue that many lives have been saved over the nearly threefourths of a century since the advent of nuclear weapons because those weapons have prevented the large conventional wars that otherwise would likely have occurred between the major powers. This is perhaps the most significant consequence of the attacks that devastated the two Japanese cities. Regarding likelihood, how do we know what the likelihood of nuclear war is and the degree to which our national policies affect that likelihood, for better or worse? How much confidence should we place in any assessment of likelihood? What levels of likelihood for the broad spectrum of possible consequences pose unacceptable levels of risk? Even a very low (nondecreasing) annual likelihood of the risk of nuclear war would result in near certainty of catastrophe over the course of enough years. Most fundamentally and counterintuitively, are we really sure we want to reduce the risk of nuclear war? The successful operation of deterrence, which has been credited – perhaps too generously – with preventing nuclear war during the Cold War and its aftermath, depends on the risk that any nuclear use might escalate to a nuclear holocaust. Many proposals for reducing risk focus on reducing nuclear weapon arsenals and, therefore, the possible consequences of the most extreme nuclear war. Yet, if we reduce the consequences of nuclear war, might we also inadvertently increase its likelihood? It’s not at all clear that would be a desirable trade-off. This is all to argue that the simplistic logic described above is inadequate, even dangerous. A more nuanced understanding of the risk of nuclear war is imperative. This paper thus attempts to establish a basis for more rigorously addressing the risk of nuclear war. Rather than trying to assess the risk, a daunting objective, its more modest goals include increasing the awareness of the complexities involved in addressing this topic and evaluating alternative measures proposed for managing nuclear risk. I begin with a clarification of why **nuclear war is a global catastrophic risk but not an existential risk**. Turning to the issue of risk assessment, I then present a variety of assessments by academics and statesmen of the likelihood component of the risk of nuclear war, followed by an overview of what we do and do not know about the consequences of nuclear war, emphasizing uncertainty in both factors. Then, I discuss the difficulties in determining the effects of risk mitigation policies, focusing on nuclear arms reduction. Finally, I address the question of whether nuclear weapons have indeed saved lives. I conclude with recommendations for national security policy and multidisciplinary research. 2 Why is nuclear war a global catastrophic risk? One needs to only view the pictures of Hiroshima and Nagasaki shown in figure 1 and imagine such devastation visited on thousands of cities across warring nations in both hemispheres to recognize that nuclear war is truly a global catastrophic risk. Moreover, many of today’s nuclear weapons are an order of magnitude more destructive than Little Boy and Fat Man, and there are many other significant consequences – prompt radiation, fallout, etc. – not visible in such photographs. Yet, it is also true that not all nuclear wars would be so catastrophic; some, perhaps involving electromagnetic pulse (EMP) attacks 2 Many mistakenly believe that the congressionally established Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack concluded that an EMP attack would, indeed, be catastrophic to electronic systems and consequently to people and societies that vitally depend on those systems. However, the conclusion of the commission, **on whose staff I served**, was only that such a catastrophe **could, not would**, result from an EMP attack. Its executive report states, for example, that “the damage level could be sufficient to be catastrophic to the Nation.” See www.empcommision.org for publicly available reports from the EMP Commission. See also Frankel et al., (2015).2 using only a few high-altitude detonations or demonstration strikes of various kinds, could result in **few casualties**. Others, such as a war between Israel and one of its potential future nuclear neighbors, might be regionally devastating but have limited global impact, at least if we limit our consideration to direct and immediate physical consequences. Nevertheless, smaller nuclear wars need to be included in any analysis of nuclear war as a global catastrophic risk because they increase the likelihood of larger nuclear wars. This is precisely why the nuclear taboo is so precious and crossing the nuclear threshold into uncharted territory is so dangerous (Schelling, 2005; see also Tannenwald, 2007). While it is clear that nuclear war is a global catastrophic risk, **it is** also **clear that it is not an existential risk.** Yet over the course of the nuclear age, a series of mechanisms have been proposed that, it has been **erroneously** argued, could lead to human extinction. The first concern3 arose among physicists on the Manhattan Project during a 1942 seminar at Berkeley some three years before the first test of an atomic weapon. Chaired by Robert Oppenheimer, it was attended by Edward Teller, Hans Bethe, Emil Konopinski, and other theoretical physicists (Rhodes, 1995). They considered the possibility that detonation of an atomic bomb could ignite a self-sustaining nitrogen fusion reaction that might propagate through earth’s atmosphere, thereby extinguishing all air-breathing life on earth. Konopinski, Cloyd Margin, and Teller eventually published the calculations that led to the conclusion that the nitrogen-nitrogen reaction was virtually impossible from atomic bomb explosions – calculations that had previously been used to justify going forward with Trinity, the first atomic bomb test (Konopinski et al., 1946). Of course, the Trinity test was conducted, as well as over **1000 subsequent atomic and thermonuclear tests, and we are fortunately still here**. After the bomb was used, extinction fear focused on invisible and deadly fallout, unanticipated as a significant consequence of the bombings of Japan that would spread by global air currents to poison the entire planet. Public dread was reinforced by the depressing, but influential, 1957 novel On the Beach by Nevil Shute (1957) and the subsequent 1959 movie version (Kramer, 1959). The story describes survivors in Melbourne, Australia, one of a few remaining human outposts in the Southern Hemisphere, as fallout clouds approached to bring the final blow to humanity. In the 1970s, after fallout was better **understood** to be limited in space, time, and magnitude, depletion of the ozone layer, which would cause increased ultraviolet radiation to fry all humans who dared to venture outside, became the extinction mechanism of concern. Again, one popular book, The Fate of the Earth by Jonathan Schell (1982), which described the nuclear destruction of the ozone layer leaving the earth “a republic of insects and grass,” promoted this fear. Schell did at times try to cover all bases, however: “To say that human extinction is a certainty would, of course, be a misrepresentation – just as it would be a misrepresentation to say that extinction can be ruled out” (Schell, 1982). **Finally, the current mechanism of concern for extinction is nuclear winter**, the phenomenon by which dust and soot created primarily by the burning of cities would rise to the stratosphere and attenuate sunlight such that surface temperatures would decline dramatically, agriculture would fail, and humans and other animals would perish from famine. The public first learned of the possibility of nuclear winter in a Parade article by Sagan (1983), published a month or so before its scientific counterpart by Turco et al. (1983). While some nuclear disarmament advocates promote the idea that nuclear winter is an extinction threat, and the general public is probably confused to the extent it is not disinterested, **few scientists seem to consider it an extinction threat.** It is understandable that some of these extinction **fears were** **created by ignorance or uncertainty and treated seriously by worst-case thinking**, as seems appropriate for threats of extinction. But nuclear **doom mongering**

also **seems to be at play** for some of these episodes. For some reason, **portions of the public active in nuclear issues, as well as some scientists**, **appear to think that arguments** for nuclear arms reductions or elimination **will be more persuasive if nuclear war is believed to threaten extinction**, rather than merely the horrific cataclysm that it would be in reality (Martin, 1982). 4 As summarized by Martin, “The idea that global nuclear war could kill most or all of the world’s population is critically examined and found to have little or no scientific basis.” Martin also critiques possible reasons for beliefs or professed beliefs about nuclear extinction, including exaggeration to stimulate action.4 To summarize, nuclear war is a global catastrophic risk. Such wars may cause billions of deaths and unfathomable suffering, as well set civilization back centuries. Smaller nuclear wars pose regional catastrophic risks and also national risks in that the continued functioning of, for example, the United States as a constitutional republic is highly dubious after even a relatively limited nuclear attack. But what nuclear war is not is an existential risk to the human race. **There is simply no credible scenario in which humans do not survive to repopulate the earth.**