1

Interpretation – appropriation means taking possession of something

Dictionary ND, Dictionary.com, “appropriation”, https://www.dictionary.com/browse/appropriation, DD AG

the act of appropriating or **taking possession of something**, often without permission or consent.

Appropriation of outer space by private entities would be the exercise of exclusive control of space by private entities.

Trapp 13 (TIMOTHY JUSTIN TRAPP, JD Candidate @ UIUC Law, ‘13, 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])//DebateDrills AY

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 Though the legitimacy of such a regime may be questionable, it remains in effect, showing that it is at least tolerable under the edict of the nonappropriation article of the Outer Space Treaty.220 There must, therefore, be something about the ITU that differentiates it from something like the Bogotá Declaration.221 The most immediate difference is the character of the body promulgating the regulation. The Bogotá Declaration is an agreement between eight countries claiming rights to all space above them.222 The ITU’s regulations are promulgated under the auspices of the U.N.223 While the Bogotá Declaration is an international agreement, it is still a very limited cooperation.224 The ITU, through the U.N., comprises the largest possible cooperation of international actors, giving it an international character as opposed to simply a multinational character.225 Furthermore, the allocation of orbital slots by the ITU is a response to the limited character of geostationary orbits.226 While the Bogotá Declaration was probably promulgated in response to a few nations’ fears that they may be excluded from the space arena,227 **the allocation system of the ITU is a measure to make sure that the GEO resource is efficiently managed for the use of all mankind**.228

That means the aff has to defend a ban on appropriating by private entities owning outer space

Violation: they defend asteroid mining, which is not possession, just a form of usage AND restriction isn’t appropriation

Merriam Webster, “restrict”, Merriam Webster, https://www.merriam-webster.com/dictionary/restrict DD AG

Definition of restrict

transitive verb

1: to confine within bounds : RESTRAIN

2: to place under restrictions as to use or distribution

Standards:

1. **Limits: there are infinitely many combinations that entities could send into space AND resources they can use. That explodes neg prep – it's impossible for me to research every possible technology and resource, from type of satellite to type of mineral.**
2. **They're extra T – space mining isn't in the bounds of the resolution**

Drop the debater using competing interps – they must justify their own model, or else their model is abusive and skewed the round

No rvi – they chill us from ever reading topicality, t is a burden the aff should meet, forces me to argue for bad theory norms, if the shell is friv should be able to answer it

2

Text – The United States should unilaterally restrict asteroid mining done by private entities.

Counterplan competes – the Plan is a multilateral agreement while the CP is just the United States.

Unilateral Actions solve – they're legally binding and perceived internationally.

Su 17 Jinyuan, S. U. "Space arms control: Lex lata and currently active proposals." Asian Journal of International Law 7.1 (2017): 61-93. //Elmer

The **unilateral statements** led by Russia are important **confidence-building measures** **for** the **security** of **outer space**. However, in international law unilateral acts may also **imply binding obligations**, subject to the fulfilment of some conditions. The **binding character** of an international obligation assumed unilaterally, as the customary principle of pacta sunt servanda, is based on **good faith**. The legal effect of unilateral statements made vis-à-vis the whole world community was addressed by the ICJ in the Nuclear Tests case, in which France committed to cease nuclear tests in the South Pacific. The ICJ expounded: It is well recognized that declarations made by way of unilateral acts, concerning legal or factual situations, may have the effect of creating legal obligations. Declarations of this kind may be, and often are, **very specific**. When it is the intention of the State making the declaration that it should become **bound according to its terms**, that intention confers on the declaration the character of a **legal undertaking**, the **State** being thenceforth **legally required to follow a course of conduct consistent with the declaration**. An undertaking of this kind, if given publicly, and with an intent to be bound, even though not made within the context of international negotiations, is **binding**. In these circumstances, **nothing in the nature** of a **quid pro quo** nor any **subsequent acceptance** of the declaration, nor even any **reply** or **reaction** from **other States**, is **required** for the **declaration to take effect**, since such a requirement would be **inconsistent** with the **strictly unilateral nature** of the juridical act by which the pronouncement by the State was made.92

China uses space coop to bolster perception of credible leadership – that causes space war and conventional conflict in the SCS

Fisher 15 Richard D. Fisher 2-8-2015 "China's Military Ambitions in Space and America's Response" http://www.uscc.gov/sites/default/files/Fisher_Testimony_2.18.15.pdf (President of Pacific Strategies, Inc)//Elmer

As with the former Soviet Union, China's pursuit of regional and then global military power is not rooted in an existential threat, but in the CCP's fears for its power position. This requires a CCP-led "rejuvenation" of China, entailing mobilization for greater power, ever more control over its own people, and then increasing control over others. Another result is **China's choice to be hostile to Western rules** or concepts that **may constrain China's power**. This justifies an essential Chinese rejection of American or Western conceptions of transparency and restraint, or verifiable weapons control in space which might constrain its power. This mirrors the CCP/PLA's repeated refusal of U.S. requests to consider real nuclear weapons transparency and control, transparency over its nuclear and missile exports, and --from many of its neighbors and Washington -- fair settlement of territorial disputes which threaten war. The latter, especially in the South China Sea, is instructive. As it has gained military power in the South China Sea, China has sought to change the strategic environment and dictate new rules to increase its security at the expense of others. Once it gains commanding strength and position in space, will China do the same? For the United States, **cooperation with China in space** may yield some benefits, but it likely **will have little impact on** the direction and severity of **terrestrial conflicts** which will dominate relations with China. One can see the value of meeting with Chinese space officials, especially higher CCP and PLA leaders, to advance concerns over their actions in space and to promote transparency. But at this juncture, before China has achieved levels of "space

dominance", **it is crucial to link any real cooperation with China to its behavior in space and elsewhere** which threatens U.S. security. Furthermore, allowing China increasing access to U.S. space technology, space corporations, or government institutions at this time presents two risks. First it could encourage **China** to **advance an illusion of cooperation with the U.S. and the West while differences on Earth become sharper**. This **could become useful for Beijing to deflect criticism** on other issues, **or** even to **obtain leverage over U.S. options** and actions. Second, as has been proven repeatedly, China will exploit any new access for espionage gains to strengthen its own space and military sectors. 2 China's increasing space power, however, like its growing economic and political power, cannot be "contained." Russia appears ready to greatly expand space and military cooperation with China as part of a larger strategic alignment, while the European Space Agency is edging toward greater cooperation with China. These attractions may only increase if China has the only LEO manned space station in the mid-2020s. Already a top commercial space service and technology provider, **China will use its** gathering **space diplomacy tools to aid its pursuit of** economic, **political and military influence in** critical regions like **Africa and Latin America**. The challenge for the United States is to maintain the means to compete with China in space both in military and non-military endeavors. China's potential for developing new space combat systems means the U.S. must be able to rapidly develop appropriate deterrent capabilities. There should also be a more developed U.S. capability to rapidly repopulate satellite systems taken down by PLA attacks, and there should be more terrestrial or airborne systems to compensate for lost navigation, communication and surveillance satellites. In addition, as the PLA moves substantially out to deep space, the Moon, or to the Lagrangian Points, it will be necessary for the U.S. to consider a compensating presence that is affordable, attractive to a coalition of democracies, and helps to deter China from seeking strategic advantage. Strategic priorities would suggest that a presence on or near the Moon is of greater importance than going to Mars. A multinational government-private presence on the Moon is one option, as is the likely less expensive option of a far cis-lunar presence to further develop manned deep space capabilities. As was the case with the former Soviet Union, relative peace on Earth or in space will not truly be possible until China evolves beyond its Leninist dictatorship. In its final years, the Soviet Union was on the cusp of deploying multiple space combat systems despite years of U.S.-Soviet space diplomacy. Real space cooperation between Russia the West became possible only after the fall of the Soviet Union, and may again become threatened by Russia's slide into authoritarian aggression. **Substantive cooperation with China** in space **offers no assurance that China will change its** threatening **behaviors on Earth or in space, but does create opportunities for China to exploit U.S. and Western** space **technology to gain** potential **military advantages**.

China uses to increase aggression in the SCS.

Yang 18 Adam Yang 3-17-2018 "How Should the US Engage China in Space?" https://thediplomat.com/2018/03/how-should-the-us-engage-china-in-space (Major in the U.S. Marine Corp and a student at the Command and Staff College)//Elmer

Subsequently, **China is pursuing international cooperation in space** – not only **for security and economic reasons**, but also **to bolster** the **legitimacy of the C**hinese **C**ommunist **P**arty **to** domestic and **international audiences.** The European Space Administration (ESA) has already expressed desires to cooperate with China on human space flight and the use of its future space station. China especially values its relationship with ESA due to the opportunities to trade and transfer technologies denied by the United States. China and Russia have also agreed to cooperate on human space flight and deep space exploration. Though these initiatives are not on the scale of a Maritime Silk Road, they do offer U.S. policymakers opportunities to work with a rising space power for positive ends. Finally, the [US] United States should pay attention to **China's diplomatic** and engagement **efforts** with other nations. Contrary to the cooperative tenets for a Maritime Silk Road, in 2016, China **convinced Cambodia to block** an Association of South East Asian Nations (**ASEAN**) joint **statement that recognized The Hague's** arbitration **ruling on the S**outh **C**hina **S**ea dispute in favor of the Philippines. In June 2017, Vietnam resisted China's demands to vacate an oil venture within its EEZ, but eventually capitulated when China threatened to use force. The most concerning aspect for Vietnam was an atypical silence from its neighbors – particularly from the Philippines, Indonesia, and Singapore. Apparently, China's political and economic **leverage** over these nations **prevented them** from publicly sympathizing with Vietnam or rebuking China's actions. Seemingly, when pressed, **China uses soft and hard power tactics bilaterally to dislodge multilateral initiatives that counter it interest**s. Could China disrupt the U.S.-European alliance as it did with

ASEAN unity? At this stage, Chinese-European cooperation in space seems well intentioned. Nevertheless, U.S. policymakers should consider whether China's growing space relations with Europe, Russia, or any other space power could complicate U.S. interests in other areas. As China strengthens its partnerships, its ability to shape laws, institutions and the strategic preferences of others increase as well.

Unchecked maritime expansion risks Nuclear War

Thayer and Han 19 (Bradley A. & Lianchao; professor of Political Science at the University of Texas San Antonio, fellow at the Belfer Center for Science and International Affairs at Harvard University; vice president of Citizen Power Initiatives for China, founder of the Independent Federation of Chinese Students and Scholars, legislative counsel and policy director in the US Senate for 12 years; (6-12-2019, https://nationalinterest.org/feature/%E2%80%98xi-doctrine%E2%80%99-proclaiming-and-rationalizing-china%E2%80%99s-aggression-62402, "The 'Xi Doctrine': Proclaiming and Rationalizing China's Aggression," National Interest, Acc:9-20-2019 (ermo/sms)

Using the occasion of the Shangri-La Dialogue in Singapore this month, Chinese Minister of National Defense and State Councilor Gen. Wei Fenghe, delivered a sharp message to the United States, which may be termed the "Xi Doctrine" on China's use of force, after Chinese premier Xi Jinping. Wei declaring both China's resolve to aggress to advance its interests and a rationalization for the use of force. Wei's de facto threat of war should not be lost in his nuances, deliberate ambiguity, or in translation. His remarks were so bellicose that the world has noticed, as was certainly intended by the leadership of the Chinese Communist Party (CCP). Empirical evidence of China's aggression is increasingly common, from its attempt to dominate the South China Sea, the neo-imperialist effort to gain control of states through the Belt and Road Initiative, to its technological imperialism to control 5G and artificial intelligence technologies. What is rather less frequent are statements from high-level Chinese officials proclaiming the country's intent to be aggressive and offering an attempted legitimizing principle justifying that aggression. While much of the content of Wei's remarks were in keeping with the gossamer pronouncements on China's peaceful intentions, as well as a paean to Xi Jinping's leadership, they still conveyed that China is ready and willing to resort to war if the United States stands in its way of global expansion; and they made clear that China must go to war, or even a nuclear war, to occupy Taiwan. Specifically, there are four elements that comprise the Xi Doctrine and are indications of China's signaling its willingness to use force. The first component is a new and alarming proclamation of the undisguised threats to use force or wage an unlimited war. China is becoming bolder as its military power grows. This is evidenced in Wei's muscular remarks on the People's Republic of China's approach against Taiwan, his explicit statement that China does not renounce the use of force against Taiwan, and his effort to deter the United States and its allies from intervention should an attack occur. Wei forcefully stated: "If anyone dares to separate Taiwan from China, the Chinese military has no choice but must go to war, and must fight for the reunification of the motherland at all costs." "At all cost" means that China **will not hesitate** to use nuclear weapons or launching another Pearl Harbor to take over Taiwan. This is a clear warning of an invasion. Second, the Xi Doctrine legitimizes territorial expansion. Through his remarks, Wei sought to convince the rest of the world that China's seizure of most of the South China Sea is an accomplished fact that cannot be overturned. He made bogus accusations, which included blaming the United States for "raking in profits by stirring up troubles" in the region. He insisted that only ASEAN and China must resolve the issue. He claimed that China's militarization on South China Sea islands and reefs were an act of self-defense. Should this be allowed to stand, then the Xi Doctrine will set a **perilous precedent** of successful territorial expansion, which will **further entice China** and jeopardize the peace of the region. Third, the doctrine targets the United States as a cause of the world's major problems and envisions a powerful China evicting the United States from the region. Wei obliquely identified the United States as the cause wars, conflicts, and unrest, and **sought** to convey that the United States will abandon the states of the South China Sea (SCS) when it is confronted by Chinese power, a typical divide and conquer strategy used by the CCP regime. The Xi Doctrine's fourth element is the mendacity regarding China's historical use of force and current actions. While the distortions of history were numerous, there were three major lies that should be alarming for the states of the region and the global community. First, Wei said that China had never invaded another country, which is a claim so transparently false it can only be a measure of the contempt he held for the audience. China has a long history of aggression, including against the Tibetans and Vietnamese, and perhaps soon against the Taiwanese. Second, Wei argued that hegemony does not conform to China's values when, in fact, China proudly was Asia's hegemon for most of the last two thousand years. Lastly, he claimed that the situation in the SCS is moving toward stability—from China's perspective this stability is caused by its successful seizure of territory. In fact, the SCS is far less stable as a result of China's actions. Efforts to counter this grab are denounced by Wei as destabilizing, which is a bit like a thief accusing you of a crime for wanting your property returned. Wei's belligerent rhetoric is an indication that the CCP regime faces deep external and internal crises. Externally, the Trump administration has shocked the CCP with the three major steps it has taken. First, it has shifted the focus of the U.S. national-security strategy and now identifies China explicitly as its primary rival—abandoning the far more muted policies of previous administrations. Second, Trump has acted on this peer competitive threat by advancing tangible measures, such as arms sales to allies and the ban of Huawei. Third, the administration has made credible commitments to assure partners and allies to counter China's aggression and bullying. These have unbalanced the CCP regime, and its natural reaction is to bully its way out. Additionally, the CCP regime has perceived that the world today has begun to consider the negative implications of China's rise, and the United States is determined to prevent what heretofore had been considered China's unstoppable rise. From the perspective of CCP, conflict is increasingly seen as inevitable and perhaps even imminent. Wei's bellicosity should be seen in this light, and the PLA is tasked with fighting and winning the war. Internally, Xi's anti-corruption campaign that selectively targets his political rivalries, and his abandoning the established rules such as term limited of presidency, have introduced deep cleavages into the unity of the regime unity. China's economic slowdown, made worse by the U.S. trade war, is a fundamental challenge to the regime's legitimacy. Xi's repression and suppression of the Chinese people, particularly human-rights defenders, Christians, Kazakhs, Uighurs, and other minorities, have miscarried. Drawing from the pages of unfortunate history, in a classic social-imperialist move, the regime wants to direct these internal tensions outward. At the same time, the nationalistic fervor advanced by the CCP's propaganda and by the rapid military modernization have made many young militant officers in the PLA overconfident. This is infrequently noticed in the West. They can hardly wait to fight an ultimate war to defeat the arch-enemy. This plainly dangerous mentality echoes the Japanese military's beliefs before Pearl Harbor.

3

No delinking from this, all of these are reasons status quo appropriation is just.

Only private sector solves space colonization.

Diakovska & Aliieva 20 [Halyna Diakovska and Olga Aliieva, Ph.D.s in Philosophy, Associate Professors, Donbass State Pedagogical University, "Consequentialism and Commercial Space Exploration," 2020, *Philosophy and Cosmology*, Vol. 24, pp. 5-24, https://doi.org/10.29202/phil-cosm/24/1, EA]

The experience of the USA showed that leadership in space exploration, which is maintained **solely through public funding**, could be **erroneous**. Since 1984, the share of public funding has **gradually decreased** in space telecommunications, commercial space transportation, remote sensing, etc., while the share of participation of **non-state enterprises** has **increased rapidly**. A **legal** and **regulatory framework** has been **modified** to **stimulate space commercialization**. The stages of space law development are discussed in the research of Valentyn Halunko (Halunko, 2019), Larysa Soroka (Soroka & Kurkova, 2019), etc. Larysa Soroka and Kseniia Kurkova explored the specifics of the legal regulation of the use and development of artificial intelligence for the space area (Soroka & Kurkova, 2019).

As a result of changing the legal framework and **attracting private investors** to the space market, the US did not lose its leadership in space exploration, but rather **secured it. Private investment** along with government funding have **significantly reduced** the **risk** of business projects in the space industry. The **quality** and **effectiveness** of space exploration programs have increased.

In 2018, Springer published an eloquent book The Rise of Private Actors in the Space Sector. Alessandra Vernile, the author of the book, explores a broad set of topics that reveal the role of private actors in space exploration (Vernile, 2018). The book covers the following topics: "Innovative Public Procurement and Support Schemes," "New Target Markets for Private Actors," etc. In the "Selected Success Stories," Vernile provides examples of successful private actors in space exploration (Vernile, 2018).

The current level of competition, which has developed on the space market, allows us to state the following fact. Private space companies have been able to compete with **entire states** in launching spacecraft, transporting cargo to orbital stations, and exploring space objects. The issue of mining on space objects, the creation of space settlements and the intensive development of the space tourism market are on the agenda.

In the 21st century, the creation of non-governmental commercial organizations specializing in the field of commercial space exploration, is regarded as an ordinary activity. They are established as parts of the universities around projects funded by private investors. For example, Astropreneurship & Space Industry Club based on the MIT community (Astropreneurship, 2019).

Large-scale research in the field of commercial space exploration, as well as the practical results achieved, led to the formation of a new paradigm called **"New Space"** ecosystem. The articles of Deganit Paikowsky's (Paikowsky, 2017), Clelia Iacomino (Iacomino & Ciccarelli, 2018) et al. reveal its key meanings and the opportunities it offers in the space sector. The "New Space" ecosystem is a new vision for commercial space exploration. It is the formation of a cosmic worldview, in which the near space with all the wealth of its resources and capabilities, becomes a **part of the global economy** and the sustainable development of the society. The "New Space" ecosystem offers the following ways for commercial space exploration (Iacomino & Ciccarelli, 2018):

1. Innovative public procurement and support schemes, which significantly expand the role of commercial actors in space exploration.

2. Attracting **new entrants** in the space sector. First of all, these are companies working in the domain of Information and communications technology, artificial intelligence, etc. that are **expanding** their research in space markets. They offer **innovative business models** and **new solutions to space commercialization.**

3. **Innovative** industrial **approaches** based on **new processes, methods, and industrial organization** for the development and production of space systems or launchers.

4. **Disruptive market solutions**, which significantly **reduce** commercial space exploration **prices**, **increase** labor **productivity**, **provide new** types of **services**, etc.

5. **Substantial private investment** from different sources and involving **different funding mechanisms.** For instance, these are private fortunes, venture capital firms, business angels, private equity companies, or banks, etc.

6. Involvement of an increasing number of space-faring nations investing in the acquisition of turnkey space capabilities or even in the development of a domestic space industrial base. This **expands** the **space markets** and **makes it more competitive.**

The analysis of the research and advances in commercial space exploration allows us to draw the following conclusions:

1. In fact, the space market **has already been created.** It is currently undergoing **continuous development** that will **integrate** the **resources** and capabilities **of** the **near space** into the global economy over the next decade.

2. A new paradigm, denoted by the term "New Space" ecosystem, is at the heart of the created space market. The "New Space" ecosystem is a **step towards** the formation of **cosmic thinking**, in which outer space, with its resources and capabilities, is considered as a sphere of human activities.

3. **Space market regulates space law**, which is constantly evolving. The space law develops within the bounds of international law. In essence, the space market is **integrated** into the **international legal field** and is governed by its laws.

Massive spillover effects, solves resources and existential risks

Green 21 [Brian Patrick Green, director of technology ethics at the Markkula Center for Applied Ethics, Santa Clara University, "Space Ethics," 2021, Rowman, pp. 4-5, EA]

In favor of going into space are such basics as gaining scientific knowledge and developing beneficial new technologies, both of which space exploration and use have already begun to accomplish with dramatic and sometimes unexpected effects for humankind. Scientific advancements include astronomical and cosmological knowledge from various orbiting experiments and telescopes that have let us gain unprecedented understanding about our universe. But space activities have also contributed to a great deal of scientific knowledge about our Earth, including measurements of environmental status, habitat conversion and destruction, detailed knowledge of anthropogenic climate change, and much about Earth's chemistry and geology. We have also learned a great deal about our local planets, for example, that a runaway "greenhouse effect" in the atmosphere of Venus makes the surface scorchingly hot, while too little greenhouse effect on Mars leaves the surface quite cold. There have also been significant contributions made to medical science, especially concerning the behavior of the human body when subjected to radiation, microgravity, nutritional restrictions, and so on.

On the technological side, everything with American global positioning system (GPS), Russian Glonass, or other global navigation systems—from smartphones to military vehicles—relies on a network of

satellites above us, placed there by rocketry and painstakingly tracked with instruments developed for the task. So many technologies have been pioneered by space exploration and use that it is hard to list them all, but some of the more important ones include weather satellites (which are not only convenient but also allow preparation for and evacuation from severe weather), communication satellites, solar photovoltaic (PV) cells, advances in electronics and computers, advances in materials science, and so on.

Space is also an important location for the contention of national interests in a geopolitical and military sense. As the ultimate "high ground" in battle, space allows certain asset classes such as spy satellites to exist in a position unassailable by many or most opponents. While permanent weapons stations and weapons of mass destruction are banned from space by the United Nations Outer Space Treaty (OST), 6 that has not stopped the development of weapons that are impermanent (such as missiles, missile interceptors, and antisatellite weapons) or the research and development of possible space-based weapons platforms, such as were envisioned by U.S. president Ronald Reagan's Strategic Defense Initiative, nicknamed "Star Wars." While military and political interests may ultimately seem to be a less noble reason to explore and use space, relative power, safety, and security certainly are very human interests and are valuable to those who feel they are being protected by them.

Space activities are also a key way of promoting international cooperation and global awareness. While the international competition of the "space race" fueled one nation all the way to the Moon, shortly afterward, the Apollo-Soyuz program announced a thawing of this competition and commenced a period of cooperation between the United States of America and the Union of Soviet Socialist Republics. Currently the International Space Station continues this cross-national cooperation in space, with five space agencies (representing Canada, the European Space Agency nations, Japan, Russia, and the United States) participating. In addition to cooperation in space exploration itself, the perspective given from space has itself helped to produce some feelings of unity on Earth, with the famous "Blue Marble" and "Earthrise" pictures showing Earth's oneness and scientific discoveries supported by space science, such as those related to climate change, helping to promote international cooperation to address these problems.

Gaining access to new critical resources may be another reason to go into space. Earth is a finite planet, and certain elements on Earth are very rare in the planetary crust, particularly platinum group metals that are very dense and siderophilic (iron-loving) and so have tended to sink toward the core over the natural history of the planet. However, asteroids and other objects in space (for example, planets, comets, and moons) can sometimes have these elements in abundance and in more available locations, making them potentially excellent sources for these valuable materials. Now-defunct asteroid-mining startup Planetary Resources once estimated that one "platinum-rich 500 meter wide asteroid contains . . . 1.5 times the known world-reserves of platinum group metals (ruthenium, rhodium, palladium, osmium, iridium, and platinum)." 7 In addition to returning elements to a resource-hungry Earth, further exploration and development of space will require access to resources that are not purely sourced from Earth. In particular, it will be necessary to gain access to water, which is relatively rare in the inner solar system and which would be far too costly to transport in any significant amounts from the Earth's surface.

Another reason that humans may want to explore space would be to create a "backup Earth" to hedge against global catastrophic and existential risks (risks that may cause widespread disaster or human extinction, respectively) on our home planet. 8 Earth has always been a dangerous place for humans, with asteroid impacts, supervolcanic eruptions, pandemic disease, and other natural hazards threatening civilization. Now, in addition to these natural threats, human-made hazards such as nuclear weapons, climate change, biotechnology, nanotechnology, and artificial intelligence may threaten not only the viability of technological civilization but perhaps the survival of human life itself. A serious global-scale catastrophe could set back civilization many decades or centuries, and the worst disasters could cause human extinction. In one scenario, in which 100 percent of humanity dies, all of human effort for all of history would be for nothing. However, were the same global catastrophe to happen to Earth, yet humans were a multiplanetary species with just one self-sustaining settlement off-Earth, it would not result in the end of human civilization or human extinction. Instead while the same unimaginable fate would befall the Earth (certainly no mere triviality, with perhaps the deaths of 99.999 percent of all humans and possibly the destruction of the ecosphere and everything in it), at least all of human and planetory history would not be for nothing. Human life and culture would go on elsewhere, as well as other Earth species. This is a dire fate, but less terrible than the first.

Space colonization solves otherwise inevitable extinction.

Zarkadakis 19 [George; December 26; Ph.D. in Artificial Intelligence; George Zardakis, "Abandoning the metropolis: space colonisation as the new imperative," https://georgezarkadakis.com/2019/12/26/abandoning-the-metropolis-space-colonisation-as-the-new-imperative/]

Space colonization is not only the subject of fiction but of **serious science** too. The late physicist Stephen Hawking argued that unless colonies were **established in space** the **human race would become extinct**. There are several **natural phenomena beyond our control** that could spell our **obliteration**. Over a long enough period of time our planet is vulnerable to catastrophic **meteor**ite strike**s**, or getting exposed to the **deadly radiation** of a nearby super**nova** explosion. As our **Sun burns** its fuel it will start to expand and, in a few million years, will **scorch Earth**. We can also **self-destruct** by waging **nuc**lear **war**, or by tilting our planet's **climate** towards a runaway greenhouse effect. Space colonization is therefore the **ultimate insurance policy** of **long-term human survival**[4].

Space Commercialization drives Tech Innovation in the Status Quo – it provides a unique impetus.

Hampson 17 Joshua Hampson 1-25-2017 "The Future of Space Commercialization" https://republicans-science.house.gov/sites/republicans.science.house.gov/files/documents/TheFutureofSpaceCommercializationFinal.pdf (Security Studies Fellow at the Niskanen Center)//Elmer

The size of the **space economy** is **far larger** than many may think. In 2015 alone, the global market amounted to $323 billion. **Commercial** infrastructure and **systems** **accounted for 76 percent** of that 9 total, with satellite television the largest subsection at $95 billion. The global space launch market's 10 11 share of that total came in at $6 billion dollars. It can be hard to disaggregate how space benefits 12 particular national economies, but in 2009 (the last available report), the Federal Aviation Administration (FAA) estimated that commercial space transportation and enabled industries generated $208.3 billion in economic activity in the United States alone. Space is not just about 13 satellite television and global transportation; while not commercial, GPS satellites also underpin personal navigation, such as smartphone GPS use, and timing data used for Internet coordination.14 Without that data, there could be problems for a range of Internet and cloud-based services.15 There is also room for growth. The FAA has noted that while the commercial launch sector has not grown dramatically in the last decade, there are indications that there is latent demand. This 16 demand may catalyze an increase in launches and growth of the wider space economy in the next decade. The Satellite Industry Association's 2015 report highlighted that their section of the space economy outgrew both the American and global economies. The FAA anticipates that growth to 17 continue, with expectations that small payload launch will be a particular industry driver.18 In the future, **emerging space industries** may contribute even more the American economy. Space tourism and resource recovery—e.g., mining on planets, moons , and asteroids—in particular may become large parts of that industry. Of course, their viability rests on a range of factors, including costs, future regulation, international problems, and assumptions about technological development. However, there is increasing optimism in these areas of economic production. But the space economy is not just about what happens in orbit, or how that alters life on the ground. The growth of this economy can also **contribute to** **new innovations across all walks of life.** Technological Innovation Innovation is generally hard to predict; some new technologies seem to come out of nowhere and others only take off when paired with a new application. It is difficult to predict the future, but it is reasonable to expect that **a growing space economy would open opportunities for technological and organizational innovation**. In terms of technology, **the difficult environment** of outer space helps **incentivize progress along the margins**. Because each object launched into orbit costs a significant amount of money—at the moment between $27,000 and $43,000 per pound, though that will likely drop in the future —each 19 reduction in payload size saves money or means more can be launched. At the same time, the ability to fit more capability into a smaller satellite opens outer space to actors that previously were priced out of the market. This is one of the reasons why **small, affordable satellites** are increasingly pursued by companies or organizations

that cannot afford to launch larger traditional satellites. These small 20 satellites also provide non-traditional launchers, such as engineering students or prototypers, the opportunity to learn about satellite production and test new technologies before working on a full-sized satellite. That **expansion of developers, experimenters, and testers** cannot **but help increase innovation opportunities**. Technological developments from outer space have been **applied to terrestrial life** since the earliest days of space exploration. The National Aeronautics and Space Administration (NASA) maintains a website that lists technologies that have spun off from such research projects. Lightweight 21 **nanotubes**, useful in protecting astronauts during space exploration, are now being tested for applications in emergency response gear and electrical insulation. The need for certainty about the resiliency of materials used in space led to the development of an analytics tool useful across a range of industries. **Temper foam,** the material used in memory-foam pillows, was developed for NASA for seat covers. As more companies pursue their own space goals, more innovations will likely come from the commercial sector. Outer space is not just a catalyst for technological development. **Satellite constellations** and their unique line-of-sight vantage point can **provide new perspectives** to old industries. Deploying satellites into low-Earth orbit, as Facebook wants to do, can connect large, previously-unreached swathes of 22 humanity to the Internet. **Remote sensing technology could change how whole industries operate, such as crop monitoring, herd management, crisis response, and land evaluation**, among others. 23 While satellites cannot provide all essential information for some of these industries, they can fill in some useful gaps and work as part of a wider system of tools. Space infrastructure, in helping to change how people connect and perceive Earth, could help spark innovations on the ground as well. These innovations, changes to global networks, and new opportunities could lead to wider economic growth.

Strong Innovation solves Extinction.

Matthews 18 Dylan Matthews 10-26-2018 "How to help people millions of years from now" https://www.vox.com/future-perfect/2018/10/26/18023366/far-future-effective-altruism-existential-risk-doing-good (Co-founder of Vox, citing Nick Beckstead @ Rutgers University)//Re-cut by Elmer

If you care about improving human lives, you should overwhelmingly care about those quadrillions of lives rather than the comparatively small number of people alive today. The 7.6 billion people now living, after all, amount to less than 0.003 percent of the population that will live in the **future**. It's reasonable to suggest that those **quadrillions** of future people have, accordingly, **hundreds of thousands of times** more moral weight than those of us living here **today** do. That's the basic argument behind Nick Beckstead's 2013 Rutgers philosophy dissertation, "On the overwhelming importance of shaping the far future." It's a glorious mindfuck of a thesis, not least because Beckstead shows very convincingly that this is a conclusion any plausible moral view would reach. It's not just something that weird utilitarians have to deal with. And Beckstead, to his considerable credit, walks the walk on this. He works at the Open Philanthropy Project on grants relating to the far future and runs a charitable fund for donors who want to prioritize the far future. And arguments from him and others have turned "long-termism" into a very vibrant, important strand of the effective altruism community. But what does prioritizing the far future even mean? The most **literal** thing it could mean is preventing human **extinction**, to ensure that the species persists as long as possible. For the long-term-focused effective altruists I know, that typically means identifying concrete threats to humanity's continued existence — like unfriendly artificial intelligence, or a pandemic, or global warming/out of control geoengineering — and engaging in activities to prevent that specific eventuality. But in a set of slides he made in 2013, Beckstead makes a compelling case that while that's certainly **part** of what caring about the far future entails, approaches that address **specific threats** to humanity (which he calls "**targeted**" approaches to the far future) have to **complement** "**broad**" approaches, where instead of trying to **predict** what's going to kill us all, you just **generally try to keep civilization running as best it can**, so that it is, as a whole, well-equipped to deal with **potential** extinction events in

the **future**, not just in 2030 or 2040 but in 3500 or 95000 or even 37 million. In other words, caring about the far future **doesn't mean just paying attention to low-probability risks of total annihilation**; it also means **acting on pressing needs now**. For example: We're going to be **better prepared** to prevent extinction from **AI** or a **supervirus** or **global warming** if society as a whole makes **a lot of scientific progress**. And a significant bottleneck there is that the vast majority of humanity doesn't get high-enough-quality education to engage in scientific research, if they want to, which reduces the **odds that we have enough trained scientists to come up with the breakthroughs** we need as a civilization to survive and thrive. So maybe one of the **best things** we can do for the **far future** is to improve school systems — here and now — to harness the group economist Raj Chetty calls "lost Einsteins" (**potential innovators** who are thwarted by poverty and inequality in rich countries) and, more importantly, the hundreds of millions of kids in developing countries dealing with even worse education systems than those in depressed communities in the rich world. What if living ethically for the far future means living ethically now? Beckstead mentions some other broad, or very broad, ideas (these are all his descriptions): Help make computers faster so that people everywhere can work more efficiently Change intellectual property law so that technological innovation can happen more quickly Advocate for open borders so that people from poorly governed countries can move to better-governed countries and be more productive Meta-research: improve **incentives** and **norms** in **academic work** to better advance human knowledge Improve education Advocate for political party X to make future people have values more like political party X "If you look at these areas (economic growth and technological progress, access to information, individual capability, social coordination, motives) a lot of everyday good works contribute," Beckstead writes. "An implication of this is that a lot of everyday good works are good from a broad perspective, even though hardly anyone thinks explicitly in terms of far future standards." Look at those examples again: It's just a list of what normal altruistically motivated people, not effective altruism folks, generally do. Charities in the US love talking about the lost opportunities for innovation that poverty creates. Lots of smart people who want to make a difference become scientists, or try to work as teachers or on improving education policy, and lord knows there are plenty of people who become political party operatives out of a conviction that the moral consequences of the party's platform are good. All of which is to say: Maybe effective altruists aren't that special, or at least maybe we don't have access to that many specific and weird conclusions about how best to help the world. If the far future is what matters, and generally trying to make the world work better is among the best ways to help the far future, then effective altruism just becomes plain ol' do-goodery.

Case

role of the judge is to vote for the debater who best defends the truth or falsity of the resolution. The aff burden is to prove the resolution true; the neg's burden is to prove it false.

- **This doesn't prevent judges from voting on education voters in theory shells or k roles of the ballot**
- **Whichever debater is better wins**

Asteroid mining not profitable enough to tradeoff with terrestrial mining

Elvis 17 [(Martin, X-Ray Astronomy PhD @Leicester University, A. Stark, B. Stalder, and C. Desira) "Astronomical Prospecting of Asteroid Resources," European Planetary Science Congress, 2017] TDI

Asteroids number in the millions and the total mass of industrially useful raw materials they contain is far vaster than the accessible materials in the Earth's crust [6]. This abundance has drawn great attention lately with a number of commercial companies developing ways to prospect for the most promising asteroids.

The mining industry term for commercially profitable concentrations of materials is **ore-bearing**. A rich vein of the desired material is not enough. A **profit** is essential. Ore-bearing is a technology dependent term. Improved methods can change material into being ore-bearing. It is also economics dependent, as a drop in price can render material non-ore-bearing, and vice versa.

There are a series of **physical factors** that **reduce** the number of asteroids that could be profitable to mine with current technology [3]. In total there remain many potentially ore-bearing asteroids, but as a fraction of the total among known NEAs they are **quite rare**, roughly **1 in 660**, or 1 in 66 if low delta-v asteroids are preselected.

This fraction could rise if a thermal infrared survey of NEAs were undertaken, as the optically dark carbonaceous asteroids may well be far more common in such a survey [7]. Until at least the mid2020s though we have only NEAs selected by their reflected optical light.

If a low delta-v NEA is selected at random some 100 must be visited to find one ore-bearing asteroid. Instead, if a rough classification into one of the 3 main type: stony (S), carbonaceous (C) or uncertain, and possibly metallic (X), then this number can be reduced to about 10 [4]. Cutting the number of spacecraft probes by an order-of-magnitude may be enabling for the closing of the business case.

Unfortunately, current investigations of NEAs, while highly successful at discovery, **fall behind** on the **information gathering** needed for prospecting [1]. Of the 2000 or so NEAs being discovered each year, **almost half** have **ill-determined orbits** in the sense that they will be almost **impossible** to **re-acquire** at their **next close approach** ("apparition"). An even greater fraction, **~90%**, have **no spectral information**, and so have **undetermined types**.

Space resources aren't used terrestrially

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Why is it So Hard to Go Back to the Moon? and The Man from Mars: The Asteroid Mining Caper. as well as Dark Crusade: A Vampire Gabriella Adventure) “Why mining asteroids and the moon will not destroy the world's economy,” Blasting News, 1/17/17, https://us.blastingnews.com/opinion/2017/01/why-mining-asteroids-and-the-moon-will-not-destroy-the-world-s-economy-001401771.html] TDI

The idea that asteroid mining is going to destroy the world economy exhibits a misunderstanding about how the new industry will work. The market for most Space materials, whether from the asteroids or the moon, **will not be on Earth,** for the most part, but in space. Water from the moon would be used to make rocket fuel and to support a lunar colony. Metals from worlds like 16 Psyche would be used to build things in space, not brought back to Earth as a building material. That arrangement would eliminate the need to ship everything from Earth.

This means metals used on space would still seek the African industry.