## 1AC

### Definitions

#### I affirm the resolution: The appropriation of outer space by private entities is unjust.

#### For this round I offer the definition of appropriation.

**Gorove states that** [Stephen Gorove, Chairman of the Graduate Program of the School of Law and Professor of Law University of Mississippi School of Law , 1969, “Interpreting Article II of the Outer Space Treat”, Fordham Lw Review Volume 37 Issue 3, <https://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=1966&context=flr> ] // Triumph Debate [King CP recut]

With respect to the concept of appropriation **the** basic **question is what constitutes "appropriation,"** **as used in the Treaty, especially in contradistinction to casual or temporary use.** **The term "appropriation" is used most frequently to denote the taking of property for one's own or exclusive use with a sense of permanence.** **Under such interpretation the establishment of a permanent settlement or the carrying out of commercial activities** by nationals of a country on a celestial body may **constitute** national **appropriation** if the activities take place under the supreme authority (sovereignty) of the state. Short of this, if the state wields no exclusive authority or jurisdiction in relation to the area in question, the answer would seem to be in the negative, unless, the nationals also use their individual appropriations as cover-ups for their state's activities.5 In this connection, it should be emphasized that **the word "appropriation" indicates a taking which involves something more than just a casual use.** Thus a temporary occupation of a landing site or other area, just like the temporary or nonexclusive use of property, would not constitute appropriation. By the same token, **any use involving consumption or taking with intention of keeping for one's own exclusive use would amount to appropriation.**

### Observation

#### I offer one crucial observational fact that the resolution states –

#### The word “appropriation” indicates a discussion of 100% exclusive use of space by private entities. This means that the negative has the ultimate burden this round to prove that all of space should be privatized without any regulations. Insofar, the affirmative doesn’t need to defend a world of no privatization of space at all but rather defend a future where regulations for the privatization of space are in place.

### FW

#### The word “unjust” in the resolution mandates a discussion about justice thus value for this round is justice.

#### The value criterion for this round is utilitarianism, a philosophy directed toward achieving the greatest happiness for the greatest number of people.

#### Here are numerous reasons why utilitarianism is the best framework to use this round –

#### 1] Utilitarianism is Intrinsic, and we can measure it through pain and pleasure – Science proves

**Moen ’16** – (Ole Martin, PhD, Research Fellow in Philosophy @ University of Oslo, "An Argument for Hedonism." Journal of Value Inquiry 50.2 (2016): 267). Modified for glang

Let us start by observing, empirically, that a widely shared judgment about intrinsic value and disvalue is that pleasure is intrinsically valuable and pain is intrinsically disvaluable. On virtually any proposed list of intrinsic values and disvalues (we will look at some of them below), pleasure is included among the intrinsic values and pain among the intrinsic disvalues**.** This inclusion makes intuitive sense, moreover, for **there is something undeniably good about the way pleasure feels and something undeniably bad about the way pain feels,** and neither the goodness of pleasure nor the badness of pain seems to be exhausted by the further effects that these experiences might have. “Pleasure” and “pain” are here understood inclusively, as encompassing anything hedonically positive and anything hedonically negative. 2 The special value statuses of pleasure and pain are manifested in how we treat these experiences in our everyday reasoning about values. If you tell me that you are heading for the convenience

#### 2] Actor Specificity – governments use utilitarian calculus when deciding whether an action is good or not

#### 3] Prerequisite – we encompass all other frameworks because our framework prioritizes life before all else

#### 4] Extinction comes first it’s the top priority in any coherent moral theory

Plummer 15 (Theron, Philosophy @St. Andrews <http://blog.practicalethics.ox.ac.uk/2015/05/moral-agreement-on-saving-the-world/>) [King CP recut]

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people. Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake. Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don’t matter. Even John Rawls wrote, “All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.” Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view. They’d thus imply very strong reasons to reduce existential risk, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk. It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. We should also take into account moral uncertainty. What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I’ve just argued that there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world. Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, all minimally plausible moral views would converge on the conclusion that we should try to save the world. While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.” (From chapter 36 of On What Matters)

### Contention 1: Problems Ignored

#### The drive to always seek more in space diverts resources from the crises on Earth – it magnifies the problems on Earth resulting in extinction.

**Williams 10** - Lynda Williams “Irrational Dreams of Space Colonization” [https://www.tandfonline.com/doi/abs/10.1080/10402650903539828?journalCode=cper20] // ahs emi [King CP recut]

Life on Earth is more urgently threatened by the destruction of the biosphere and its life-sustaining habitat due to environmental catastrophes such as climate change, ocean acidification, disruption of the food chain, bio-warfare, nuclear war, nuclear winter, and myriads of other manmade doomsday possibilities. If we accept these threats as inevitabilities on par with real astronomical dangers and divert our natural, intellectual, political, and technological resources from solving these problems into escaping them, will we be playing into a self-fulfilling prophesy of our own planetary doom? Seeking space-based solutions to our earthly problems may actually exacerbate the planetary threats we face. This is the core of the ethical dilemma posed by space colonization: should we put our resources into developing human colonies on other worlds to survive natural and manmade catastrophes, or should we focus all of our energies on solving and mitigating the problems that create these threats on Earth? What do the prospects of colonies or bases on the moon and Mars offer? Both the moon and Mars host extreme environments that are uninhabitable to humans without very sophisticated technological life-support systems beyond any that are feasible now or will be available in the near future. Both bodies are subjected to deadly levels of solar radiation and are void of atmospheres that could sustain oxygen-based life forms such as humans. Terra-forming either body is not feasible with current technologies and within any reasonable time frames (and may, in any case, be questioned from an ethical and fiscal point of view). Thus, any colony or base would be restricted to living in space capsules or trailer park-like structures that could not support a sufficient number of humans to perpetuate and sustain the species in any long-term manner. Although evidence of water has been discovered on both bodies, it exists in a form that is trapped in minerals, of soil to produce one ton of helium-3. (25 tons of helium-3 would be required to power the United States for one year.) Fusion also requires the very rare element tritium, which does not exist naturally on the moon, Mars, or Earth in the abundances needed to facilitate nuclear fusion energy production. Currently, there are no means for generating the energy on the moon needed to extract the helium-3 to produce the promised endless source of energy. Similar energy problems exist for the proposed use of solar power on the moon, which has the additional problem of being sunlit two weeks a month and dark for the other two weeks. moon base is envisioned as serving as a launch pad for Martian expeditions, so the infeasibility of a lunar base may prohibit trips to Mars, unless they are launched directly from Earth or via an orbiting space station. Mars is, in its closest approach, 36 million miles from Earth and would require a nine-month journey with astronauts exposed to deadly solar cosmic rays. Providing sufficient shielding would require a spacecraft that weighs so much that it becomes prohibitive to carry enough fuel for a roundtrip. Either the astronauts get exposed to lethal doses on a roundtrip, or they make a safe one-way journey and never return. Regardless, it is unlikely that anyone would survive a trip to Mars. Whether or not people are willing to make that sacrifice for the sake of scientific exploration, human missions to Mars do not guarantee the survival of the species, but rather, only the death of any member who attempts the journey. The technological hurdles prohibiting practical space colonization of the moon and Mars in the near future are stratospherically high; the environmental and political consequences of pursuing these lofty dreams are even higher. There are no international laws governing the moon or the protection of the space environment. The Moon Treaty, created in 1979Siddharthi by the United Nations, declares that the moon shall be developed to benefit all nations, that no military bases could be placed on the moon or on any celestial body, and bans altering the environment of celestial bodies. To date, no space-faring nation has ratified this treaty, meaning the moon, and all celestial bodies including Mars and asteroids, may be up for the taking. If a nation did place a military base on the moon, they could potentially control all launches from Earth. The moon is the ultimate military high ground. How can we, as a species, control the exploration, exploitation, and control of the moon and other celestial bodies if we cannot even commit to a legal regime to protect and share its resources? Since the space age began, the orbital environment around Earth has become crowded with satellites and space debris, so much so that circumterrestrial space has become a dangerous place with an increasing risk of collision and destruction. Thousands of pieces of space junk, created from past launches and space missions, orbit the Earth at the same distance as satellites, putting them at risk of collision. Every time a space mission is launched from Earth, debris from the rocket stages is added to orbital space. In 2009Virodhi, there was a disastrous collision between an Iridium satellite and a piece of space junk that destroyed the satellite. In 2007Sarvajeeth, China blew up one of its defunct satellites to demonstrate its antiballistic missile capabilities, increasing the debris field by 15 percent. The United States followed suit a few months later when, in February 2008Sarvahari, it used its ship-based antiballistic missile system to destroy one of its own satellites that had reportedly gone out of control. There are no international laws prohibiting antisatellite actions. Every year, since the mid-1980s Raudra through Shulka, a treaty has been introduced into the UN for a Prevention of an Arms Race in Outer Space (PAROS), with all parties, including Russia and China, voting for it, except for the United States and Israel. How can we hope to pursue peaceful and environmentally sound space exploration without international laws in place that protect space and Earth environments, and guarantee that the space race to the moon and beyond does not foster a war over space resources? Indeed, if the space debris problem continues to grow unfettered, or if such a thing as a space war were ever to occur, then space would become too trashed for further launches to take place without a great risk of destruction. The private development of space is growing at a flurried pace. Competitions such as the X-Prize for companies to reach orbit and the Google Prize to land a robot on the moon have helped create a new desire for space travel in many citizens throughout the world. The reality is that there are few protections for the environment and the passengers of these flights of fancy. The Federal Aviation Administration (FAA), which regulates space launches, is under a Congressional mandate to foster the industry. It is difficult, if not impossible, to have objective regulation of an industry when it enjoys government incentives to profit. We have much to determine on planet Earth before we launch willy-nilly into another space race that would inevitably result in environmental disaster and include a new arms race in the heavens. If we direct our intellectual and technological resources toward space exploration without consideration of the environmental and political consequences, what is left behind in the wake? The hype surrounding space exploration leaves a dangerous vacuum in the collective consciousness of solving the problems on Earth. If we accept[ing] the inevitability of the destruction of Earth and its biosphere, then it is perhaps not too surprising that many people grasp at the last straw and look toward the heavens for solutions and a possible resolution. Many young scientists are perhaps fueling the prophesy of our planetary destruction by dreaming of lunar and/or Martian bases to save humanity, rather than working on the serious environmental challenges that we face on Earth. Every space-faring entity, be they governmental or corporate, faces the same challenges. Star Trek emboldened us all to dream of space as the final frontier. The reality is that our planet Earth is a perfect spaceship and may be our final front-line. We travel around our star, the sun, once every year, and the sun pulls us around the galaxy once every 250,000,000 years through star systems, star clusters, and gas clouds that may contain exosolar planets that host life or that may be habitable for us to colonize. The sun will be around for billions of years and we have ample time to explore the stars. It would be wise and prudent for us as a species to focus our intellectual and technological knowledge into preserving our spaceship for the long voyage ahead so that, once we have figured out how to make life on Earth work in an environmentally and politically sustainable way, we can then venture off the planet into the new frontier of our dreams.

### Contention 2: Space Debris

#### Private entities are increasing mining now

Robert Garcia 18, currently an LLM Candidate in Cornell Law School's Law, Entrepreneurship & Technology program at Cornell Tech in NYC., “Regulating International Space Mining, an Enormous Industry,” Pacific Council on International Policy, 10-23-2018, <https://www.pacificcouncil.org/newsroom/regulating-international-space-mining-enormous-industry> [King CP recut]

In 2015, the United States passed the U.S. Commercial Space Launch Competitiveness Act. The law’s passage has caused some consternation in the international space exploration community, as it specifically contemplates U.S. citizens performing commercial recovery in what would be a clear appropriation of asteroid and space resources. The law in pertinent part states that such U.S. citizens: shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States (emphasis added). Luxembourg was quick to follow suit, and it passed its own national space mining law styled the Law of 20 July 2017 on the Exploration and Use of Space Resources. This law seeks to parallel U.S. law. However, according to a spokesman for the Luxembourg Ministry of Economy, there is one significant expansion over U.S. law, in that "in the U.S. law, a majority of a company's stakeholders must be in the United States, while the Luxembourg law places no restrictions on stakeholder locations." Critics state that the controlling international law is to be found in the United Nations treaties on space exploration. There are five major space treaties, but two specifically address exploitation of outer space resources. The first is the "Outer Space Treaty" (OST). One hundred nations, including the major spacefaring nations-the United States, China, Japan, and the Russian Federation-have ratified it. A subsequent treaty-the Moon Agreement-provides in a relevant part in Article 11, Paragraph 2, that "[t]he moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means." As of January 2018, relatively few states (18 total) had ratified the Moon Agreement and four additional states had signed but not ratified the agreement. However, of these 22 states, perhaps only Australia, France, and India have the capability to launch space vehicles. The Moon Agreement could have provided some guidance on exploitation of space resources, as it ostensibly prohibits claiming lunar natural resources for private ownership. However, the United States and Luxembourg are not parties to the Moon Agreement, and in consequence the treaty has no "governing effect." Nonetheless, some legal scholars contend that the United States would be in breach of its international obligations if it were to "unilaterally pretend" that its citizens may exercise ownership over extracted space resources, given the absence of recognition of such rights under international law. Clearly it is the stated aim of both the United States and Luxembourg to promote the commercial exploitation of space resources. The two nations’ respective pieces of legislation attempt to provide a legal basis for private citizens to engage in such activities, which some critics would characterize as prohibited "appropriation" under international law. The international community would be well-served by resolving the issue conclusively with an appropriate body of rules. As the technologies advance, we are inexorably headed toward space mining becoming a reality. Whether it will lead to increased resources, providing a net benefit for all people on earth, or serve to increase economic inequality by disproportionately favoring the spacefaring nations remains to be seen.

#### That causes dangerous space mining and deregulation globally

Edd Gent 20, freelance science and technology writer, “Space Mining Should Be a Global Project—But It's Not Starting Off That Way,” Singularity Hub, 10-12-2020, <https://singularityhub.com/2020/10/12/the-us-is-trying-to-hijack-space-mining-and-there-could-be-disastrous-consequences/> [King CP recut]

Exploiting the resources of outer space might be key to the future expansion of the human species. But researchers argue that the US is trying to skew the game in its favor, with potentially disastrous consequences. The enormous cost of lifting material into space means that any serious effort to colonize the solar system will require us to rely on resources beyond our atmosphere. Water will be the new gold thanks to its crucial role in sustaining life, as well as the fact it can be split into hydrogen fuel and oxygen for breathing. Regolith found on the surface of rocky bodies like the moon and Mars will be a crucial building material, while some companies think it will eventually be profitable to extract precious metals and rare earth elements from asteroids and return them to Earth. But so far, there’s little in the way of regulation designed to govern how these activities should be managed. Now two Canadian researchers argue in a paper in Science that recent policy moves by the US are part of a concerted effort to refocus international space cooperation towards short-term commercial interests, which could precipitate a “race to the bottom” that sabotages efforts to safely manage the development of space. Aaron Boley and Michael Byers at the University of British Columbia trace back the start of this push to the 2015 Commercial Space Launch Competitiveness Act, which gave US citizens and companies the right to own and sell space resources under US law. In April this year, President Trump doubled down with an executive order affirming the right to commercial space mining and explicitly rejecting the idea that space is a “global commons,” flying in the face of established international norms. Since then, NASA has announced that any countries wishing to partner on its forthcoming Artemis missions designed to establish a permanent human presence on the moon will have to sign bilateral agreements known as Artemis Accords. These agreements will enshrine the idea that commercial space mining will be governed by national laws rather than international ones, the authors write, and that companies can declare “safety zones” around their operations to exclude others. Speaking to Space.com Mike Gold, the acting associate administrator for NASA’s Office of International and Interagency Relations, disputes the authors’ characterization of the accords and says they are based on the internationally-recognized Outer Space Treaty. He says they don’t include agreement on national regulation of mining or companies’ rights to establish safety zones, though they do assert the right to extract and use space resources. But given that they’ve yet to be released or even finalized, it’s not clear how far these rights extend or how they are enshrined in the agreements. And the authors point out that the fact that they are being negotiated bilaterally means the US will be able to use its dominant position to push its interpretation of international law and its overtly commercial goals for space development. Space policy designed around the exploitation of resources holds many dangers, say the paper authors. For a start, loosely-regulated space mining could result in the destruction of deposits that could hold invaluable scientific information. It could also kick up dangerous amounts of lunar dust that can cause serious damage to space vehicles, increase the amount of space debris, or in a worst-case scenario, create meteorites that could threaten satellites or even impact Earth. By eschewing a multilateral approach to setting space policy, the US also opens the door to a free-for-all where every country makes up its own rules. Russia is highly critical of the Artemis Accords process and China appears to be frozen out of it, suggesting that two major space powers will not be bound by the new rules. That potentially sets the scene for a race to the bottom, where countries compete to set the laxest rules for space mining to attract investment. The authors call on other nations to speak up and attempt to set rules through the UN Committee on the Peaceful Uses of Outer Space. Writing in The Conversation, Scott Shackelford from Indiana University suggests a good model could be the 1959 Antarctic Treaty, which froze territorial claims and reserved the continent for “peaceful purposes” and “scientific investigation.” But the momentum behind the US’ push might be difficult to overcome. Last month, the agency announced it would pay companies to excavate small amounts of regolith on the moon. Boley and Byers admit that if this went ahead and was not protested by other nations, it could set a precedent in international law that would be hard to overcome. For better or worse, it seems that US dominance in space exploration means it’s in the driver’s seat when it comes to setting the rules. As they say, to the victor go the spoils.

**Increasing the number of satellites from private companies like SpaceX would massively increase the risk of dangerous space debris.**

**Scheer and Moss 20** [(Roddy Scheer and Doug Moss, ) “The Good, The Bad &amp; The Ugly: Satellites &amp; The Environment,” Emagazine https://www.newsbreak.com/news/2178042533743/the-good-the-bad-the-ugly-satellites-the-environment, 8-13-2020//Ak// [King CP recut]

Putting satellites up into the ionosphere—the layer of our atmosphere extending from 50-600 miles above the surface where a high concentration of ions and free electrons facilitate the reflection of radio waves—isn’t anything new. The Soviets beat us to the punch when they launched the first satellite, Sputnik, in 1957, but these days there are over 9,000 satellites overhead, the majority from U.S. companies and government agencies. But with Elon Musk’s SpaceX poised to launch tens of thousands of new ones in the next few years, many people wonder whether putting all this technology overhead is such a good idea. One concern is that all this hardware eventually breaks down and shed parts. Peter Greenstreet of the Institute of Physics reports that this so-called “space junk” orbits at some 7.5 kilometers per second—so fast that even the tiniest pieces create a potential hazard for space stations and other man-made or natural objects making the same rounds.

**The impact is twofold--**

**1] Pollution– it can’t be fixed and is hugely impactful on the ozone layer – which when ignored causes extinction.**

**Prinn et al. 05**

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The ability of the lower atmosphere (troposphere) to remove most air pollutants depends on complex chemistry driven by the relatively small amount of the sun’s ultraviolet light that penetrates through the upper atmospheric (stratospheric) ozone layer (see: Ehhalt, 1999; Prinn, 2003). This chemistry is also driven by emissions of NOx, CO, CH4 and VOCs and leads to the production of O3 and OH. Figure 1 reviews, with much simplification, the chemical reactions involved (Prinn, 1994). The importance of this chemistry to climate change occurs because it involves both climate-forcing greenhouse gases (H2O, CH4, O3) and air pollutants (CO, NO, NO2). It also involves aerosols (H2SO4, HNO3, BC) that influence climate (through reflecting or absorbing sunlight), productivity of ecosystems (through their exposure to O3, and to H2SO4 and HNO3 in acid rain), and human health (through inhalation). Also important are free radicals and atoms in two forms: very reactive species like O(1 D) and OH, and less reactive ones like HO2, O(3 P), NO and NO2. 3 UV N2O Lightning CFCs O( 1D) Hydrosphere Biosphere & Human Activity HNO3 Greenhouse Gases Primary Pollutants Absorbing Aerosols (BC) Reactive Free Radical/Atom Less Reactive Radicals Reflective Aerosols O3 H2SO4 BC Stratosphere Figure 1. Summary of the chemistry in the troposphere important in the linkage between urban air pollution and climate (after Prinn, 1994, 2003). VOCs (not shown) are similar to CH4 in their reactions with OH, but they form acids, aldehydes and ketones in addition to CO. Referring to Figure 1, when OH reacts with CH4 the CH4 is converted mostly to CO in steps that consume OH and also produce HO2. The OH in turn converts CO to CO2, NO2 to HNO3, and SO2 to H2SO4. The primary OH production pathway occurs when H2O reacts with the O(1 D) atoms that come from dissociation of O3 by ultraviolet (UV) light. Within about a second of its formation, on average, OH reacts with other gases, either by donating its O atom (e.g., to CO to form CO2 and H) or by removing H (e.g., from CH4 to form CH3 and H2O). The H and CH3 formed in these ways attach rapidly to O2 to form hydroperoxy (HO2) or methylperoxy (CH3O2) free radicals which are relatively unreactive. If there is no way to rapidly recycle HO2 back to OH, then levels of OH are kept relatively low. The addition of NOx emissions into the mix significantly changes the chemistry. Specifically, a second pathway is created in which NO reacts with HO2 to form NO2 and to reform OH. Ultraviolet light then decomposes NO2 to produce O atoms (which attach to O2 to form O3) and reform NO. Hence NOx (the sum of NO and NO2) is a catalyst which is not consumed in these reactions. The production rate of OH by this secondary path in polluted air is about five times faster than the above primary pathway involving O(1 D) and H2O (Ehhalt, 1999). The reaction of NO with HO2 does not act as a sink for HOx (the sum of OH and HO2) but instead determines the ratio of OH to HO2. Calculations for 4 polluted air suggest that HO2 concentrations are about 40 times greater than OH (Ehhalt, 1999). This is due mainly to the much greater reactivity of OH compared to HO2. If emissions of air pollutants that react with OH, such as CO, VOCs, CH4, and SO2, are increasing, then keeping all else constant, OH levels should decrease. This would increase the lifetime and hence concentrations of CH4. However, increasing NOx emissions should increase tropospheric O3 (and hence the primary source of OH), as well as increase the recycling rate of HO2 to OH (the second source of OH). This OH increase should lower CH4 concentrations. Thus changing the level of OH causes greenhouse gas, and thus climate, changes. Climate change will also influence OH. Higher ocean temperatures should increase H2O in the lower troposphere and thus increase OH production through its primary pathway. Higher atmospheric temperatures also increase the rate of reaction of OH with CH4, decreasing the concentrations of both. Greater cloud cover will reflect more solar ultraviolet light, thus decreasing OH, and vice versa. Added to these interactions involving gases, are those involving aerosols. For example, increasing SO2 emissions and/or OH concentrations should lead to greater concentrations of sulfate aerosols which are a cooling influence. Accounting for all of these interactions, and other related ones (see e.g., Prinn, 2003), requires that a detailed interactive atmospheric chemistry and climate model be used to assess the effects of air pollution reductions on climate.

mini-satellites, or forcing the junk to burn up in the atmosphere.

#### 2] Space War - Independently, unregulated mining causes all out space war and eventually extinction.

Fengna Xu 20, Law School, Xi’an Jiaotong University, “The approach to sustainable space mining: issues, challenges, and solutions,” FNGN Xu 2020 IOP Conf. Ser.: Mater. Sci. Eng. 738 012014

3.1. Conflicts between multiple States Space resources, as res communis [3], can be appropriated to some extent on the basis of freedom of exploration and use of the outer space. However, it is likely to follow a ‘first come, first served’ approach to space resources activities. In fact, the ‘first come, first served’ approach drove early and rapid development of oil industry of the US in the 19th century, although a frenetic race among surface owners followed and led to an extraordinary waste of oil and gas. Given that so far there are no agreement or property rights on space resources, they are essentially in a ‘state of nature’. Allocation by the ‘first come, first served’ approach is simple and requires very little government involvement to deter another one (called a ‘junior’) from displacing the rightful first comer (called a ‘senior’). However, overprotecting the senior by priority rights could run the risk of disorder, waste, inequality, and even monopoly. The Outer Space Treaty, requires State parties to conduct all their activities in outer space ‘with due regard to the corresponding interests of all other States Parties’. Without specific coordinating rules, conflicts between multiple States are likely to happen. Private entities may choose to arm themselves to safeguard their own interests. In extreme cases, States may also protect them by placing weapons of mass destruction in outer space if necessary [4]. As a result, priority rights should not be absolute but subjected to some arrangements. 7

### Contention 3: International Law

#### The Outer Space Treaty affirms – Article 2 applies to all private entities under a government and states that absolute appropriation of space is illegal.

Kurt Taylor, Fictions of the Final Frontier: Why the United States SPACE Act of 2015 Is Illegal, 33 Emory Int'l L. Rev. 653 2019 <https://scholarlycommons.law.emory.edu/eilr/vol33/iss4/6> JS

The broad text in Article II of the Outer Space Treaty provides an ordinary and unambiguous meaning free from absurdity.90 The language of Article II is short: “[o]uter 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.”91 At first glance, the language clearly intends to bar ownership over all aspects of outer space, with the only wrinkle of confusion being the meaning of “national appropriation.” Stephen Gorove, a space law expert, has suggested it is better to first define appropriation before determining how “national” modifies the term.92 Broadly, appropriation is “the taking of property for one’s own or exclusive use with a sense of permanence.”93 In this regard, appropriation is of a “national” character when it is by an entity under the sovereignty of the state from which they come or represent.94 Even though Article II uses the “national” language, its ordinary meaning is most closely linked to all sovereignties and the individuals and entities that attain property rights under the authority of a sovereign. A separate insight of classic legal realism logically lends itself to the same conclusion. For an individual to hold property rights in something, the government must legally recognize the property rights.95 The language of Article II bars governments from recognizing property interests in outer space for themselves. Because individuals and private entities cannot hold property rights in something without recognition from a sovereign that it will protect their rights, a correct interpretation of the language of Article II should bar the ability of private entities and individuals to appropriate rights over celestial resources as well. If a state recognizes a property right held by an individual over a celestial body or resource, such recognition would constitute a form of national appropriation because it is essentially “a de facto exclusion of other states and their nationals” to that body or resource.96 The text of Article II naturally leads to the conclusion that its non-appropriation language is binding on all actors— state and private.