Shell

#### Interpretation: the affirmative must only garner offense from PTD

#### Violation: they garner offense from the amendment of the OST.

#### PTD is the simplest method + solves the majority of impacts

**Babcock 2019** (Hope M. Babcock, “The Public Trust Doctrine, Outer Space, and the Global Commons: Time to Call Home ET,” Syracuse Law Review, Vol. 69, No. 2, 2019, <https://scholarship.law.georgetown.edu/cgi/viewcontent.cgi?article=3219&context=facpub>) //neth

The doctrine also appears to be infinitely malleable. Original uses of the doctrine were restricted to only that “aspect of the public domain below the low-water mark on the margin of the sea and the great lakes, the waters over those lands, and the waters within rivers and streams of any consequence,”520 and covered only traditional uses of those lands, like fishing and navigation.521 Over time, the scope and application of the doctrine broadened to protect more public resources and different uses.522 Thus, the doctrine expanded to protect new trust resources, such as dry sand beaches, inland lakes, groundwater, dry riverbeds, and wildlife,523 and passive uses of those resources, like scientific study.524 The original link to navigable water and tidelands disappeared.525 Supporters of the doctrine successfully advocated that it be applied to “wildlife, parks, cemeteries, and even works of fine art,”526 while arguing more recently its application to the atmosphere.527 A doctrine that imposes a perpetual duty on the sovereign to preserve trust resources, prevents their alienation for private benefit, assures public access to them, and can be invoked by anyone seems particularly useful as a management tool in outer space.528 The fact that public access to trust resources is so central to the doctrine makes it reflective, not contradictory, of international space law’s bar against appropriation of outer space and of the principle of space being the “province of all mankind.”529 It avoids the problems of alienation and exclusion associated with any of the management approaches associated with some form of private property and requires neither the creation of a new administrative authority nor the presence of a close-knit group of like-minded people.530 Members of the public, both rich and poor, can invoke and enforce the doctrine as easily as the sovereign.531 It is cost effective to the extent that no separate apparatus is required to implement it, and the doctrine has shown itself to be highly adaptable and innovative as different needs arise.532 It could also fill the gap in international law with respect to managing celestial property. Therefore, of all the management approaches studied here, the PTD seems the most suited to keep order in space until a regulatory regime is imposed. However, the doctrine provides no incentives for development of trust resources; rather, it might be used to limit or curtail that development, making it an imperfect, perhaps even counter-productive solution by itself to the extent that such development might be beneficial.533 Modifying the doctrine to allow limited use of private property management approaches, like tradable development claims, might buffer that effect—a form of overlapping hybridity between one type of property, a commons, and a management regime from another, private property, enabled by application of the PTD. CONCLUSION “Only a legal system that accommodates both the human need for resources and the necessary preservation of mankind’s common heritage can fulfill these criteria.”534 The future is now with regard to the development of outer space and its resources—it is no longer a question of whether humans will engage in these activities, but how soon they will. Technically advanced countries and private commercial enterprises are probing outer space and preparing for landing on an asteroid or the moon to extract their resources.535 Speculators are selling deeds to the moon’s surface and preparing to exploit the tourism potential that space offers.536 But, the legal framework for managing these initiatives is almost nonexistent.537 International treaties came into being before all this activity began in earnest and national laws that might apply are stunted by jurisdictional quandaries like the absence of national boundaries in outer space.538 Thus, there is an urgency to figure out how to control what happens in outer space before its resources are irreparably damaged or permanently monopolized by powerful countries and individuals. In the absence of regulation, much of the current debate centers on what property regime should be applied in outer space.539 The assumption is that by only allowing private property rights in space, countries and commercial enterprises will undertake the risks and costs of space development.540 However, unless international space law changes, it may prevent this from happening. If it changes, strong management controls will be necessary to prevent destruction or over-consumption of celestial resources, as well as monopolization and competitive behavior by participants, which could lead to hostilities and inequities. This Article examines various private property regimes, including those of less than full fee ownership, to see if any would avoid the conflict with the international prohibition on appropriation of outer space and its resources. It concludes that none will because each retains the right to exclude and each is insensitive to the treaties’ equity concerns. In contrast, considering outer space to be common is consistent with international space law in both respects. Hypothesizing that private property in outer space may yet prevail, this Article investigates different private property management approaches, such as the right of first possession, lotteries, and tradable development rights, to see if any would be cost effective, easy to implement and equitable, and would also prevent over-consumption, monopolization or the slide into rivalrous behavior. The Article concludes that each comes up short in some respect. Social norms as a management tool for property held in common, although compliant with international law, are also not up to the task. Instead, although ancient, the PTD, with its malleability, easy and cost-effective implementation and enforcement, non-consumption principle, and consistency with the goals that animate international space treaties, seems best suited to the task of protecting the public’s interests in the global commons that is outer space as it has done for centuries in Earth-bound commons. But, as its principal terrestrial use has been to protect trust resources from development, the doctrine needs some modification to encourage development of celestial resources. Hence, this Article suggests that modifying the PTD to allow the application of private property management tools, like tradable development rights, will not only allow development, but also will assure that when it happens, it will not be just profitable for a few, but will also be sustainable and equitable.

#### Standards

#### 1 – limits – there are infinite definitions of what private appropriations of outer space could. Your model justifies infinite affs and kills the neg’s ability to engage – we can’t be expected to prep for each of these affs – kills fairness bc big schools will always have access to more prep and kills education bc we wont be able to have substantive discussions on the aff.

#### 2 – predictability – PTD was a core aff when college policy debated a similar topic – proves that it’s at the core of the topic AND it’s what most debaters will prep against – teams use past instances of similar topics as a starting point for prep. And our model is better for small schools bc it means there’s already answers to the aff disclosed on the college policy wiki

#### Voters –

#### 1 -- Fairness – you need fairness to evaluate debate rounds – the judge needs to vote for the better debater not the better cheater. Unfair advantages in debate rounds make decisions illegitimate and hurt our ability to access real world skills. If they try to go for “fairness bad” then just vote neg because it means you’re under no obligation to evaluate their arguments fairly.

#### 2 – education – it’s a voter because it’s the reason schools fund debate and the only portable skills we gain from debate are a result of education – knowing how to discuss the merits of broad policy options has more real world implications than knowing how to go for an rvi or knowing how to defend policies that are so obscure they’d never be passed.

#### Paradigm issues –

#### 1 – No RVIs

#### a] logic – you don’t get to win just for proving you’re topical

#### b] chilling effect – rvis disincentivize debaters from checking abuse

#### 2 – competing interpretations over reasonability

#### a] arbitrariness – reasonability is arbitrary and invites judge intervention

#### b] brightlines mean competing interps – it becomes a debate of whose brightline is best which is the same thing as competing interps – you’re debating about whose model is best

#### 3 – drop the debater

#### a] logic – drop the argument doesn’t make sense – the shell indics their entire advocacy

#### b] severance – if they go for drop the argument it’s severance and an independent reason to negate – kicking out of the aff no-links all neg offense and forces us to restart and finish the debate in the 2nr – means there’s no way the neg can access the ballot because 2ar gets recontextualizations

CP

#### CP text: we advocate for public-private partnerships in space in line with the ISS model or a sponsored program model

**ISS National Lab** [International Space Station National Laboratory – Center for the Advancement of Science in Space, “Research on the ISS, No Date, <https://www.issnationallab.org/research-on-the-iss/public-private-partnerships-in-space/>] //neth

Public-private partnerships are a key component to driving innovation and national leadership. With the potential to address a wide array of modern challenges from technology development to infrastructure modernization, and from education to the economic development of space, public-private partnerships unlock new possibilities unavailable when we rely solely on public or private investment. The International Space Station (ISS) National laboratory is a great example of a public-private partnership model that is working in space. The ISS National Lab opens up the incredible possibilities of the space station research environment to a diverse range of researchers, entrepreneurs, and innovators that could create entirely new markets in space. The ISS National Laboratory – Accelerating Utilization of the ISS The ISS offers a unique research and development platform, unlike any on Earth, enabling research that benefits both exploration and life on Earth. In an effort to expand the research opportunities this unparalleled platform provides to the nation, the ISS United States Orbital Segment, through bipartisan legislation, was designated as a U.S. National Laboratory in 2005, enabling research and development access to a broad range of commercial, academic, and government users. After final assembly of the ISS in 2011, the Center for the Advancement of Science in Space, a (501)(c)(3) organization, was selected by NASA to manage the ISS U.S. National Laboratory. The ISS National Lab fulfills its mission to accelerate space-based research by engaging a variety of nontraditional space users, operating in the fields of life science, physical science, technology development, and remote sensing. The ISS National Lab engages primarily with organizations that pay toward the value obtained on the ISS, as well as with other organizations addressing national science and research priorities. This research serves commercial and entrepreneurial needs and other important goals such as the pursuit of new knowledge and education. Since 2011, the ISS National Lab has stewarded more than 200 ISS research projects, ranging from developing new drug therapies, to monitoring tropical cyclones, to improving equipment for first-responders, to producing unique fiber-optics materials in space. Working together with NASA, the ISS National Lab aims to advance the nation’s leadership in commercial space, pursue groundbreaking science not possible on Earth, and leverage the space station to inspire the next generation. Prior to the ISS National Lab model, NASA traditionally funded all aspects of ISS research, whether it was research needed to further exploration, or discovery-based space research that expanded upon its scientific agenda. As the ISS evolved into a National Laboratory, the ISS National Lab has increased the diversity of users by accelerating utilization of the ISS as an innovation platform for a wide variety of partners. These include Fortune 500 organizations, small businesses, educational institutions, philanthropic and research foundations, federal and state government agencies, and other thought leaders in pursuit of groundbreaking technology and innovation who are interested in leveraging microgravity to solve complex research problems on Earth. The ISS National Lab plays a role in not only attracting a diverse set of users, including private companies, to utilize the ISS, but also in engaging the private sector through various research and cost-sharing arrangements. Sponsored Programs – Accelerating Third-Party Funding for Space Research The ISS National Lab has developed a successful Sponsored Program model that attracts third-party funding from private industry and other government agencies to solve big problems or address target challenges. These programs translate into projects on the ISS National Lab. The Sponsored Program model enables an organization to ask new questions and explore key variables, using the ISS National Lab environment as a tool in their innovation portfolio. In return, the organization creates opportunities for targeted research and development projects and STEM education projects or fosters novel ideas of startup companies. Fortune 500 companies, government agencies, and regional incubators have successfully used the ISS National Lab Sponsored Program model. This unique research and development model is flexible to meet the needs and budget of a partnering organization. Successful Sponsored Programs include Boeing Mass Challenge, Massachusetts Life Sciences Center, National Science Foundation (NSF) fluid dynamics and combustion Sponsored Program, and the National Institutes of Health (NIH) National Center for Advancing Translational Sciences (NCATS) organ-on-chip technologies Sponsored Program, totaling more than $20 million in third-party funding over the last two years. Additional Sponsored Programs totaling close to $5 million in 2017 with Fortune 500 organizations are imminent and will target major challenges to humankind as well as STEM education initiatives.

Asteroid Mining DA

**We are at the brink of extinction through global warming- current emission rates leave us seven years until irreversibility.**

**Hassan ‘20(**Hassan, Jennifer. “How Long until It's Too Late to Save Earth from Climate Disaster? This Clock Is Counting down.” The Washington Post, WP Company, 21 Sept. 2020, [www.washingtonpost.com/climate-environment/2020/09/21/climate-change-metronome-clock-nyc/](http://www.washingtonpost.com/climate-environment/2020/09/21/climate-change-metronome-clock-nyc/).) SJ

How long does the world have left to act before an irreversible climate emergency alters human existence as we know it? A new digital clock unveiled in Manhattan’s Union Square over the weekend promises to tell you — down to the very second. The [Climate Clock](https://climateclock.world/) unveiled by artists Gan Golan and Andrew Boyd warned at 1:30 p.m. Monday that there were 7 years, 101 days, 17 hours, 29 minutes and 22 seconds until Earth’s carbon budget is depleted, based on current emission rates. A total depletion would thrust the world into further turmoil and suffering through more flooding, more wildfires, worsening famine and extensive human displacement, according to the artists. The display, plastered onto the side of a glass building for Climate Week, shows two numbers. The first, displayed in red, is what the creators refer to as a “deadline.” The timer counts down how long it will take for the world to burn through its carbon budget if swift action isn’t taken to keep warming under 1.5 degrees Celsius above preindustrial levels. If Earth’s temperatures increase by 1.5 degrees Celsius, the planet will fall victim to extreme heat waves, fires, droughts and limited water availability, a 2019 NASA report on global climate change [warns](https://climate.nasa.gov/news/2865/a-degree-of-concern-why-global-temperatures-matter/). Under the Paris agreement, more than 180 countries have pledged to work together to keep Earth’s temperature below a rise of two degrees Celsius (3.6 degrees Fahrenheit) — and if possible, 1.5 degrees. (President Trump announced in November that [the United States was withdrawing from the climate accord](https://www.washingtonpost.com/climate-environment/2019/11/04/trump-makes-it-official-us-will-withdraw-paris-climate-accord/?itid=lk_inline_manual_8).) The clock’s second figure, displayed in green, is labeled a “lifeline.” It tracks the percentage of available energy being supplied from renewable sources. “Simply put, we need to get our lifeline to 100% before our deadline reaches 0,” the clock’s official website notes. The installation, which was unveiled Saturday, replaces the astronomical clock that was first erected at [Metronome](https://www.publicartfund.org/exhibitions/view/metronome/), New York City’s public art wall that was constructed in 1999. The original 60-foot-wide monument at 1 Union Square South was designed by Kristin Jones and Andrew Ginzel, who wanted to explore “the relationship between the city and time,” according to the Public Art Fund website. The string of numbers known as “The Passage” showed how much time had passed since midnight and how much time was left until midnight. But the somewhat peculiar design, with its brickwork, bursts of smoke and perplexing LED display, sparked major confusion over the years, with many unsure as to what the numbers actually represented; some people falsely believed the digits were an indicator of national debt. For Golan and Boyd, the message behind the new numbers is simple: For Earth to survive, carbon emissions must be reduced — and time is running out. “Our planet has a deadline. But we can turn it into a lifeline,” Boyd told The Washington Post on Monday. Golan explained that the idea to create a Climate Clock was inspired by the birth of his first child a week before the United Nations’ Intergovernmental Panel on Climate Change (IPCC) “released its [devastating report](https://www.washingtonpost.com/energy-environment/2018/10/08/world-has-only-years-get-climate-change-under-control-un-scientists-say/?itid=lk_inline_manual_20) on how little remaining time we had left to make progress on climate change, before the catastrophic effects became irreversible.” He added that the arrival of his daughter dramatically changed his view of the world: “What we did in the next few years would determine the world my daughter would live in, that all of us would live in, and I felt that timeline needed to be understood by everyone, everywhere.” [Doomsday Clock is 100 seconds to midnight, the symbolic hour of the apocalypse](https://www.washingtonpost.com/weather/2020/01/23/doomsday-clock/?itid=lk_interstitial_manual_24) This isn’t the first time Golan and Boyd have joined forces to make a statement about global warming. In September 2019, just days before Greta Thunberg addressed the U.N. General Assembly, the teen climate activist asked Boyd and Golan to build her a handheld climate clock. At the time, she said she wanted to show it to the U.N. secretary general — and had found the artists after they had offered to work with the IPCC on a clock to accompany its scathing 2018 climate report. In what they describe as a “lightning-speed effort,” Golan and Boyd pulled together a team of climate science experts, programmers, electrical engineers and designers to create the clock Thunberg wanted — battery-powered and synchronized to the Climate Clock. Thunberg’s bespoke device was hand-delivered to her hotel the night before her speech. She has since carried it around the world on her travels. [Greta Thunberg had one question at the U.N. climate summit: ‘How dare you?’](https://www.washingtonpost.com/climate-environment/2019/09/23/greta-thunberg-vows-that-if-un-doesnt-tackle-climate-change-we-will-never-forgive-you/?itid=lk_interstitial_manual_31) The New York climate clock will be on display until Sept. 27, although the creators say it may one day become a permanent fixture of the Manhattan landscape. The artists are now calling on people to [create](https://climateclock.world/make) their own clocks and say they are working with cities around the world to install their own versions. “Different countries and different communities may have different roles, but we all have to be on the same timeline,” Golan said, calling for “global unity.”

**Private entities are key to asteroid mining and fulfilling demand for rare earth elements**

**Britt 21** (Hugo Britt, August 19, 2021, Companies Are Preparing for Space Mining, <https://www.thomasnet.com/insights/companies-are-preparing-for-space-mining/>) SJ

Rare Earth Materials Are Abundant. There are around two million near-earth asteroids brimming with rare earth minerals, precious metals, iron, and nickel. The Moon contains helium-3, yttrium, samarium, and lanthanum, while Mars contains an abundance of magnesium, aluminum, titanium, iron, chromium, and trace amounts of lithium, cobalt, tungsten, and other metals. Importantly, many planetary bodies contain water, which through hydrolysis can be used as rocket fuel. It Helps with Sustainability Earth’s resources are finite. [Non-renewable metal resources are inherently unsustainable](https://www.nature.com/articles/s43247-020-0011-0), and mining causes environmental degradation all over the world. The answer is to source our minerals off-world. Off-world minerals are exhaustible as well, but the argument is that mining lifeless rocks such as the Moon or asteroids is infinitely preferable to continuing to damage Earth’s fragile biosphere. Discoveries May Be Made Opening space to commercial mining does not mean that science takes a back seat. Space-mining interests could drive scientific advancement by discovering extremely rare or unknown minerals on other planetary bodies. Robotics Would Do the Work While countless lives have been lost on Earth over the centuries due to mining accidents and disasters, it is likely that humans will not have to risk their lives by traveling in-person to off-world mining sites. [Regolith-sampling probes](https://www.thomasnet.com/insights/nasa-uses-pogo-stick-probe-to-retrieve-sample-from-asteroid-that-may-one-day-hit-earth/) are already in use and provide an early glimpse of what a scaled-up robotic mining craft may one day look like. Off-Earth Mining and Space Law The [1967 Outer Space Treaty](https://www.thomasnet.com/insights/is-the-outer-space-treaty-outdated/) is unclear in terms of whether any country — or private company — can claim mineral rights in space. It states that “exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind.” The [1979 Moon Treaty](https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/moon-agreement.html) was an attempt to declare the Moon and its natural resources to be CHM (Common Heritage of Mankind). Significantly, it called for “an equitable sharing [by all countries] in the benefits derived from these resources.” Most nations, including the U.S., did not ratify this treaty. Recently, the U.S. has accelerated its efforts to create a legal framework for the exploitation of resources in space. The Obama administration signed the [U.S. Commercial Space Launch Competitiveness Act of 2015](https://www.faa.gov/about/office_org/headquarters_offices/ast/media/US-Commercial-Space-Launch-Competitiveness-Act-2015.pdf), allowing U.S. citizens to “engage in the commercial exploration and exploitation of space resources.” In April 2020, the Trump administration issued an [executive order](https://www.space.com/trump-moon-mining-space-resources-executive-order.html) supporting U.S. mining on the Moon and asteroids. In May 2020, NASA unveiled the [Artemis Accords](https://www.washingtonpost.com/technology/2020/05/15/moon-rules-nasa-artemis/), which included the development of safety zones around lunar mining sites. Former NASA administrator Jim Bridenstine said: “It’s time to establish the regulatory certainty to extract and trade space resources,” and clarified in a separate statement that: “We do believe we can extract and utilize the resources of the moon, just as we can extract and utilize tuna from the ocean.” NASA planned an [Asteroid Redirect Mission](https://www.nasa.gov/content/what-is-nasa-s-asteroid-redirect-mission) which involved collecting a multi-ton boulder from an asteroid and redirecting it into a stable orbit around the moon, but the mission was canceled in 2017. What Companies Are Preparing for a Future of Space Mining? One thing that is becoming clear is that off-earth mining is unlikely to be a state-run activity. Instead, several private companies are jockeying to be first in line to access minerals in space. [iSpace](https://ispace-inc.com/) (Japan) has a mission to “help companies access new business opportunities on the moon,” including the extraction of water and mineral resources to spearhead a space-based economy. Planetary Resources (defunct) was founded in 2009 with the goal of developing a robotic asteroid mining industry. Despite having high-profile founding investors including Alphabet’s Larry Page, Eric Schmidt, and Virgin Group founder Richard Branson, Planetary ran into financial trouble in 2018 and was gone by 2020. Deep Space Industries (defunct) was another early mover that intended to explore, examine, sample, and harvest minerals from asteroids. DSI was acquired by Bradford Space in 2019. [Offworld](https://www.offworld.ai/) is an AI company building “universal industrial robots to do the heavy lifting [including mining] on Earth, the Moon, asteroids, and Mars.” [The Asteroid Mining Corporation](https://asteroidminingcorporation.co.uk/) (UK) is a venture currently crowdfunding for a 2023 satellite mission called “El Dorado,” which will conduct a spectral survey of 5,000 asteroids to identify the most valuable for mining. Alongside the U.S., the tiny European nation of Luxembourg has also developed a space mining framework and has subsequently [emerged as a European hub](https://www.businesswire.com/news/home/20201118005699/en/) for the fledgling industry.

**Reducing dependency on terrestrial rare earth elements is key to combating climate change.**

**Serpell 21** (Oscar Serpell, Associate Director of Academic Programming, Kleinman Center For Energy Policy. “Rare Earth Elements: A Resource Constraint Of The

Energy Transition,”. May 18, 2021. <https://kleinmanenergy.upenn.edu/research/publications/rare-earth-elements-a->

resource-constraint-of-the-energy-transition/.)

Climate change is presenting humans with an unprecedented challenge: the need to wean ourselves off of a group of valuable natural resources; not because of scarcity or cost, but because of their long-term global pollution impacts. Although the combined capabilities of wind, solar, hydropower, and geothermal technologies have the potential to harness near limitless amounts of energy from our environment, they are not free from the limitations of resource availability. On the contrary, the clean energy transition will require economic mobilization on a scale not seen since the industrial revolution, and will strain the global production of silicon, cobalt, lithium, manganese, and a host of other critical elements (Behr2019).

**Warming is linear—every decrease in rising temperatures radically mitigates the risk of existential climate change.**

Xu and Ramanathan 17, Yangyang Xu, Assistant Professor of Atmospheric Sciences at Texas A&M University; and Veerabhadran Ramanathan, Distinguished Professor of Atmospheric and Climate Sciences at the Scripps Institution of Oceanography, University of California, San Diego, 9/26/17, “Well below 2 °C: Mitigation strategies for avoiding dangerous to catastrophic climate changes,” Proceedings of the National Academy of Sciences of the United States of America, Vol. 114, No. 39, p. 10315-10323//recut CHS PK

We are proposing the following extension to the DAI risk categorization: warming greater than 1.5 °C as [is] “dangerous”; warming greater than [and] 3 °C as [is] “catastrophic?”; and warming in excess of 5 °C as “unknown??,” with the understanding that changes of this magnitude, not experienced in the last 20+ million years, pose existential threats to a majority of the population. The question mark denotes the subjective nature of our deduction and the fact that catastrophe can strike at even lower warming levels. The justifications for the proposed extension to risk categorization are given below. From the IPCC burning embers diagram and from the language of the Paris Agreement, we infer that the DAI begins at warming greater than 1.5 °C. Our criteria for extending the risk category beyond DAI include the potential risks of climate change to the physical climate system, the ecosystem, human health, and species extinction. Let us first consider the category of catastrophic (3 to 5 °C warming). The first major concern is the issue of tipping points. Several studies (48, 49) have concluded that 3 to 5 °C global warming is likely to be the threshold for tipping points such as the collapse of the western Antarctic ice sheet, shutdown of deep water circulation in the North Atlantic, dieback of Amazon rainforests as well as boreal forests, and collapse of the West African monsoon, among others. While natural scientists refer to these as abrupt and [or]irreversible climate changes, economists refer to them as catastrophic events (49). Warming of such magnitudes also has catastrophic human health effects. Many recent studies (50, 51) have focused on the direct influence of extreme events such as heat waves on public health by evaluating exposure to heat stress and hyperthermia. It has been estimated that the likelihood of extreme events (defined as 3-sigma events), including heat waves, has increased 10-fold in the recent decades (52). Human beings are extremely sensitive to heat stress. For example, the 2013 European heat wave led to about 70,000 premature mortalities (53). The major finding of a recent study (51) is that, currently, about 13.6% of land area with a population of 30.6% is exposed to deadly heat. The authors of that study defined deadly heat as exceeding a threshold of temperature as well as humidity. The thresholds were determined from numerous heat wave events and data for mortalities attributed to heat waves. According to this study, a 2 °C warming would double the land area subject to deadly heat and expose 48% of the population. A 4 °C warming by 2100 would subject 47% of the land area and almost 74% of the world population to deadly heat, which could pose existential risks to humans and mammals alike unless massive adaptation measures are implemented, such as providing air conditioning to the entire population or a massive relocation of most of the population to safer climates. Climate risks can vary markedly depending on the socioeconomic status and culture of the population, and so we must take up the question of “dangerous to whom?” (54). Our discussion in this study is focused more on people and not on the ecosystem, and even with this limited scope, there are multitudes of categories of people. We will focus on the poorest 3 billion people living mostly in tropical rural areas, who are still relying on 18th-century technologies for meeting basic needs such as cooking and heating. Their contribution to CO2 pollution is roughly 5% compared with the 50% contribution by the wealthiest 1 billion (55). This bottom 3 billion population comprises mostly subsistent farmers, whose livelihood will be severely impacted, if not destroyed, with a one- to five-year megadrought, heat waves, or heavy floods; for those among the bottom 3 billion of the world’s population who are living in coastal areas, a 1- to 2-m rise in sea level (likely with a warming in excess of 3 °C) poses existential threat if they do not relocate or migrate. It has been estimated that several hundred million people would be subject to [in] famine with warming in excess of 4 °C (54). However, there has essentially been no discussion on warming beyond 5 °C. Climate change-induced species extinction is one major concern with warming of such large magnitudes (>5 °C). The current rate of loss of species is ∼1,000-fold the historical rate, due largely to habitat destruction. At this rate, about 25% of species are in danger of extinction in the coming decades (56). Global warming of 6 °C or more (accompanied by increase in ocean acidity due to increased CO2) can act as a major force multiplier and expose as much as 90% of species to the dangers of extinction (57). The bodily harms combined with climate change-forced species destruction, biodiversity loss, and threats to water and food security, as summarized recently (58), motivated us to categorize warming beyond 5 °C as unknown??, implying the possibility of existential threats. Fig. 2 displays these three risk categorizations (vertical dashed lines).

Framing

#### I concede the value and standard of utilitarianism, however:

#### [Pummer] Extinction comes first under any framework

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

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome ggood 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 ndermined 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)

Case

#### On the contention –

#### OVERVIEW - they never prove that space colonization will happen – means they don’t get access to any of their impacts. This contention is a laundry list of bad impacts that happen if space colonization occurs but they cant weigh any of it unless they prove that space colonization is imminent AND that the aff does something to stop it

#### The space industry won’t survive without private funding – this controls the internal link to your international space governance arg

**Nguyen-Le 2021** (July 19, 2021, Hanh Nguyen-Le, “Billionaire private investment is good for the space industry, whether we like it or not,” <https://blogs.lse.ac.uk/usappblog/2021/07/19/billionaire-private-investment-is-good-for-the-space-industry-whether-we-like-it-or-not/>) //neth

The private sector has always had a close involvement with space Billionaire interest in space is not new. Historically, science research funding for observatories in the 19th and 20th centuries was typically provided through endowments from wealthy individuals. Institutions such as the Smithsonian and the Guggenheim family were the early donors of Robert Goddard’s ambitious projects to develop rockets and space technology. Following 1980s initiatives like MirCorp’s plan to provide privately owned space stations, the 1990s and 2000s saw commercial space efforts like Peter Diamandis’ introduction of the Ansari X Prize (1996), the US government’s Alternate Access to [the International Space] Station Program (2000-2002), and the founding of Mojave Aerospace Ventures (2004). Between 2001 and 2009 seven wealthy people went to space as paying customers on Russian Soyuz rockets including Dennis Tito, Iranian American businesswoman Anousheh Ansari and Cirque du Soleil founder Guy Laliberte. More recently, aside from Jeff Bezos and Richard Branson, other billionaires have also planned trips to space, including Jared Isaacman and Yusaku Maezawa. The wave of billionaires now seemingly interested in space exploration is a return to a past trend. Space exploration is expensive Private actors and the government think differently when it comes to what type of space programs to prioritize. The government prioritizes aspects of a space program that are in the public-interest such as national security and Earth sciences, while wealthy individuals that enter the space sector are interested in personal and financial endeavors that involve space exploration, such as making life multiplanetary for Elon Musk and space tourism for Richard Branson and Dennis Tito. The Apollo program which ultimately sent astronauts to the moon in 1969 is thought of as the height of US government leadership in space. But the massive investment which made the first moon landing possible was an anomaly that had been driven by political necessity given the climate of the Cold War. As Figures 1 and 2 show, by 1965, the US government had begun to cut NASA’s budget to the point that by the 1970s it made up only about 0.5-1 percent of the total federal budget. According to Dr. John Logsdon of George Washington University’s Space Policy Institute: “From 1970 onward, NASA has not had a budget adequate to support a robust program of human exploration.”

#### Colonizing Mars is key – solves extinction and acts as a springboard for future colonization

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Dirk and Paul, Journal of Cosmology, Vol.12, p. 3619-3626, October-November, “To Boldly Go: A One-Way Human Mission to Mars” http://journalofcosmology.com/Mars108.html

There are several reasons that motivate the establishment of a permanent Mars colony. We are a vulnerable species living in a part of the galaxy where cosmic events such as major asteroid and comet impacts and supernova explosions pose a significant threat to life on Earth, especially to human life. There are also more immediate threats to our culture, if not our survival as a species. These include global pandemics, nuclear or biological warfare, runaway global warming, sudden ecological collapse and supervolcanoes (Rees 2004). Thus, the colonization of other worlds is a must if the human species is to survive for the long term. The first potential colonization targets would be asteroids, the Moon and Mars. The Moon is the closest object and does provide some shelter (e.g., lava tube caves), but in all other respects falls short compared to the variety of resources available on Mars. The latter is true for asteroids as well. Mars is by far the most promising for sustained colonization and development, because it is similar in many respects to Earth and, crucially, possesses a moderate surface gravity, an atmosphere, abundant water and carbon dioxide, together with a range of essential minerals. Mars is our second closest planetary neighbor (after Venus) and a trip to Mars at the most favorable launch option takes about six months with current chemical rocket technology. In addition to offering humanity a "lifeboat" in the event of a mega-catastrophe, a Mars colony is attractive for other reasons. Astrobiologists agree that there is a fair probability that Mars hosts, or once hosted, microbial life, perhaps deep beneath the surface (Lederberg and Sagan 1962; Levin 2010; Levin and Straat 1977, 1981; McKay and Stoker 1989; McKay et al. 1996; Baker et al. 2005; Schulze-Makuch et al. 2005, 2008, Darling and Schulze-Makuch 2010; Wierzchos et al. 2010; Mahaney and Dohm 2010). A scientific facility on Mars might therefore be a unique opportunity to study an alien life form and a second evolutionary record, and to develop novel biotechnology therefrom. At the very least, an intensive study of ancient and modern Mars will cast important light on the origin of life on Earth. Mars also conceals a wealth of geological and astronomical data that is almost impossible to access from Earth using robotic probes. A permanent human presence on Mars would open the way to comparative planetology on a scale unimagined by any former generation. In the fullness of time, a Mars base would offer a springboard for human/robotic exploration of the outer solar system and the asteroid belt. Finally, establishing a permanent multicultural and multinational human presence on another world would have major beneficial political and social implications for Earth, and serve as a strong unifying and uplifting theme for all humanity.

#### Privatization is inevitable – 75% of space is already privatized

**Urrutia 2018** (Doris Elin Urrutia, October 12, 2018, “How Will Private Space Travel Transform NASA's Next 60 Years?” <https://www.space.com/42113-nasa-future-private-spaceflight.html>) //neth

First, people should understand that about 75 percent of the worldwide space enterprise is already commercial, said Scott Hubbard, an adjunct professor in the Department of Aeronautics and Astronautics at Stanford University. This includes the satellites belonging to DirecTV and Sirius XM radio. What's news is the extension of that into the human realm," said Hubbard, who also previously directed NASA's Ames Research Center in Silicon Valley. He served as the agency's "Mars czar," restructuring NASA's robotic Red Planet-exploration program after it suffered several failures in the 1990s. And if private companies can get the price of a suborbital flight down to about $50,000, "you get a lot of interest," Hubbard told Space.com. The highest-profile program currently in the works between NASA and the private sector is the agency's Commercial Crew Program, said Eric Stallmer, president of the nonprofit Commercial Spaceflight Federation. Commercial Crew is encouraging the development of U.S. spacecraft that will carry astronauts to and from the International Space Station (ISS). Toward this end, NASA has awarded multibillion-dollar contracts to both SpaceX and Boeing, which are building capsules called Crew Dragon and CST-100 Starliner, respectively. These craft are currently scheduled to start flying astronauts sometime next year. There's also the maturing commercial cargo program, which has given contracts to SpaceX and Northrop Grumman Corp. to fly robotic cargo missions to the ISS. Both of these companies have already completed numerous such flights. Both Hubbard and Stallmer said that NASA wins by relying on private industry to provide such services in low Earth orbit. Hubbard argued that this strategy allows the space agency to continue "exploring the fringe where there really is no business case."

#### Moon treaty did not work – no reason to believe OST will work

**Mirzaee 2017** (Siavash Mirzaee, “Outer Space and Common Heritage of Mankind: Challenges and Solutions,” RUDN Journal of Law – December 2017, <https://www.researchgate.net/publication/317121083_Outer_Space_and_Common_Heritage_of_Mankind_Challenges_and_Solutions> | DOI: 10.22363/2313-2337-2017-21-1-102-114) //neth

Moon Agreement is the last international Agreement in the field of Space Law. The importance of the Agreement on the grounds that there are many consideration to the framework of the concept of common heritage of mankind compared to other documents. The Moon Agreement is contentious because it amends the legal status of the Moon, from the ‘province of all mankind’ under the Outer Space Treaty, to the ‘common heritage of mankind’ [13. P. 7]. Although it was adopted by the United Nations General Assembly, but it has not welcomed by the international communities. The most important reasons for ineffectiveness of Moon Agreement are failure to comply with realities and containing the concept of common heritage of mankind. Earlier space treaties were based on contemporary problems and drew on factual testimony from experts. In the Moon Agreement drafters attempted to develop binding rules decades ahead of the necessary technology. If history is a guide, then the international community must wait for natural resource exploitation to become a contemporary problem on which experts can offer informed expertise before regulation can proceed [14]. In the time of drafting of Moon Agreement, the necessity of complying the provisions with realities were supported by the Soviet Union. The Soviet Union took the position that since exploitation of the moon would not be economically feasible for some time, provisions for such exploitation were premature. The United States favored the inclusion of such provisions because it believed that future conflicts could be avoided by present action [3. P. 419]. Therefore, it seems that some of provisions of the Agreement neither in the time of adoption nor in the present time have not much compliance with realities. Some countries, including Russia, think these provisions are inadequate because they do not address all possible situations. Accordingly, they have suggested that a new, comprehensive Agreement should be negotiated [15. P. 232]. The most important reason for ineffectiveness of Moon Agreement is related to including the concept of common heritage of mankind (Article 11, Paragraph 1) against countries with advanced space technology. In order to fulfill this principle, the Agreement states that an international regime should be founded with the aim of the development of the natural resources of the moon, the rational management of those resources, the expansion of opportunities in the use of those resources and an equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries (Article 11, Paragraph 7). It has been one of the main reasons for disapproval of space powers and it has led to the failure of the Agreement. The developed nations fear that adoption of the common heritage principle in space exploration would tantamount to transfer of wealth, political power, and technology from the space-faring nations to the Third World countries [16. P. 213]. This approach made dissatisfied those private firms that they have undertaken spatial researches. For example, the L5 Society, as a private firm succeed to convince the Senate Foreign Relations Committee of the United States to oppose signing of the Moon Agreement [17]. In addition to the aforementioned subject, there are more reasons for developed countries disapproval regarding Moon Agreement as following: First, Principles enshrined in the Moon Agreement are a departure from traditional property rights. Second, the Agreement would establish guiding principles for the international regime inimical to the interests of private enterprise. Third, the Agreement gives to other countries political control over commercial exploitation of the moon [3. P. 421].