## 1

#### Interp: The actor of the aff plan must be private entities

#### By denotes the actor as private entities since the topic says “by private entities”

Oxford Dictionary n.d.-- <https://www.google.com/search?q=by+definition&rlz=1C5GCEM_enUS927US927&oq=by+definition&aqs=chrome..69i57j69i59l2j0i271j69i60l4.1893j0j4&sourceid=chrome&ie=UTF-8&surl=1&safe=active&ssui=on>, Accessed 12/8/21, (AG DebateDrills)

identifying the agent performing an action.

#### Prefer on framer’s intent: if the topic committee wanted to have a governmental actor, they could have used the same wording structure as every other resolution

#### Violation: They spec [x]

#### Private entities specifically excludes state bodies such as governments and multistate organizations like the UN

US Code 90--https://www.law.cornell.edu/uscode/text/42/12131#1, Accessed 12/8/21. (Pub. L. 101–336, title III, § 301, July 26, 1990, 104 Stat. 353.) (AG DebateDrills)

(1)Public entity

The term “public entity” means—

(A)any State or local government;

(B)any department, agency, special purpose district, or other instrumentality of a State or States or local government; and

(C)the National Railroad Passenger Corporation, and any commuter authority (as defined in section 24102(4) [1] of title 49).

Continuing

The term “private entity” means any entity other than a public entity (as defined in section 12131(1) of this title).

#### Standards:

#### 1] Predictable Limits: Following the structure of the topic is most important. A) It creates a stable stasis point from which to debate, allowing fair access to the topic, that is far more clear than anything that can be made up through pragmatic standards—if they do read pragmatics first, force them to justify why winning banning LAWs is a better topic wouldn’t mean we’d have to debate that, B) it creates harmony in different circuits and localities. It’s not good for local circuits, east coast, west coast, et cetera to be divided on what a topic means because they have different debate styles that mean pragmatic considerations yield different results. It creates bad debate rounds and decks clash in national tournaments, C) allowing them to use state actors forces the debate to be about process, opening up many separate paths for aff offense the neg needs to prepare for. For example UN resolution, collective unilateral action, single state plans, amendments to the outer space theory, et cetera.

#### 2] Phil Ed: A private actor radically reshapes the phil debates we have on this topic away from generics like libertarian Kant NCs that we read every topic. When we talk about individual actions, it opens new philosophical debates about duties, rule consequentialism, theories of contract, et cetera. Even the traditional Kant debates become far more about contradictions in individual’s actions. Finally, at the level of debating what theory we use, having a different actor totally reshapes framework debates, since actor specificity no longer is the easiest util out. This heavily outweighs on timeframe and reversability: we can get other education whenever we want, but only have a few months to debate this unique topic.

### 1NC Voter – LD

#### D] Voter:

#### Fairness and education are voters – debate’s a game that needs rules to evaluate it and education gives us portable skills for life like research and thinking.

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

#### Drop the debater – a) they have a 7-6 rebuttal advantage and the 2ar to make args I can’t respond to, b) it deters future abuse and sets a positive norm.

#### Use competing interps – a) reasonability invites arbitrary judge intervention since we don’t know your bs meter, b) collapses to competing interps – we justify 2 brightlines under an offense defense paradigm just like 2 interps.

#### No RVIs – a) illogical – you shouldn’t win for being fair – it’s a litmus test for engaging in substance, b) norming – I can’t concede the counterinterp if I realize I’m wrong which forces me to argue for bad norms, c) chilling effect – forces you to split your 2AR so you can’t collapse and misconstrue the 2NR, d) topic ed – prevents 1AR blipstorm scripts and allows us to get back to substance after resolving theory

#### Evaluate T before 1AR theory – a) norms – we only have a couple months to set T norms but can set 1AR theory norms anytime, b) magnitude – T affects a larger portion of the debate since the aff advocacy determines every speech after it

#### No impact turns to T—T is a procedural that determines case’s validity and every argument says the aff is bad

## 2

#### Private companies are quickly getting ready to put humans on Mars—without them, even political will would mean another 20 years

Redfern 11/14—Martin Redfern; Martin Redfern studied geology at University College London. Since 1981 he has worked as an executive producer at the BBC World Service Science Unit; “Will we ever step foot on Mars?”; BBC; Nov 14 2021; <https://www.bbcearth.com/news/will-we-ever-set-foot-on-mars>; (AG DebateDrills)

Currently, a human mission to Mars take 20 years minimum—private companies have already signaled an ability to rapidly speed up the timeline After the Apollo Moon missions in the 1970s, sending astronauts to Mars seemed the next logical step, but it would be a ‘giant leap’, politically and financially. Space is big: while it took the Apollo astronauts only four days to reach the Moon, with present technology it would take about nine months to reach Mars. By the time the planets align favourably for a return, a complete mission might last two or three years. Throughout that time, the astronauts would need food, water and oxygen, plus protection from radiation. At this point, the success rate for robot missions does not inspire confidence. Russia has launched 21 Mars rockets to date, including five unmanned landers, but only two orbiters completed their missions. The US has been more successful, losing only five out of 23 missions. But there has yet to be a return mission. Clearly some more work is needed before we can contemplate sending humans to Mars. But, sooner or later, we will go. With the political will, it could be within 20 years. And one thing that can be done in the meantime is test human psychological resilience for such a mission. The current record holder for the longest spaceflight is the Russian astronaut Valeri Polyakov, who returned to Earth from Mir in March 1995 after 437 days in space. Such a feat tests the human body’s ability to withstand the muscle and bone loss associated with zero gravity, and is a psychological test of will and endurance. And while contact with astronauts on the International Space Station (ISS) is simple, as it takes only a fraction of a second to relay messages to and from Earth, radio signals take 20 minutes to reach Mars, so astronauts there will feel much more isolated, adding to the psychological stress of confinement with a small team. These testing conditions have been simulated on Earth in order to evaluate their effect on people. Mars 500 was a Russian/European/Chinese project between 2007 and 2011 in an isolation facility in a Moscow car park. It culminated in a 520-day stay by six male volunteers. They claimed to be in good health throughout, but some avoided exercise and hid from their colleagues, and four had difficulty sleeping. The latest simulation – Hawaii Space Exploration Analog and Simulation, run for NASA by the University of Hawaii – took place in the Mars-like landscape of Hawaii, 2,500m up the side of the Mauna Loa volcano. A team of six emerged from a year in isolation there on 28 August 2016. They had been allowed out on simulated Mars walks, but only wearing a full space suit; the rest of the time they were living in cramped conditions in a 100sq m geodesic dome. The European Space Agency also performs regular evaluations of the crew at the remote Concordia station in Antarctica to assess the effects of confinement during the long, dark polar winter. Mars Society president Robert Zubrin has a mission plan that, he believes, will be safer and cheaper than any other. It involves first launching an unmanned Earth Return Vehicle (ERV) that would land on Mars and use solar or nuclear power and imported hydrogen to produce methane and oxygen from Martian CO2. In other words, rocket fuel. This means that humans would set out only once they knew there would be a fuelled return vehicle waiting for them on Mars. The craft Mars Society president Robert Zubrin has a mission plan that, he believes, will be safer and cheaper than any other. It involves first launching an unmanned Earth Return Vehicle (ERV) that would land on Mars and use solar or nuclear power and imported hydrogen to produce methane and oxygen from Martian CO2. In other words, rocket fuel. This means that humans would set out only once they knew there would be a fuelled return vehicle waiting for them on Mars. The craft they fly out on, he says, would stay on Mars to provide future accommodation. A second ERV would be launched at the same time to provide back-up and, if all goes well, would be ready to bring the next team home two years later. In this way, a series of return trips would build up a number of living spaces on Mars for longer stays in the future. And because most of the fuel for the return trip would be made on Mars, Zubrin believes huge energy and cost savings could be made. Elon Musk NASA’s own plans are more cautious. They involve moving long-duration human missions out from the ISS to orbit the Moon over the next 13 years, while continuing the scientific exploration of Mars; followed up with cargo delivery and an unmanned sample-return mission in the late 2020s. But, they say, it won’t be before the early 2030s that humans orbit Mars, let alone land on the planet. Meanwhile, Elon Musk, former PayPal entrepreneur and founder of SpaceX, has his own plans. He already has a NASA contract for delivering supplies to the ISS and hopes to be able to deliver cargo to Mars in 2018, in preparation for a human mission in the 2020s. ‘Mars is something we can do in our lifetimes,’ he says.

#### Privatization of space also creates economic benefits for the ability to source resources from space—exactly what is needed for a human mission to Mars

Crawford 16-- Crawford, I. A. (2016); Department of Earth and Planetary Sciences, Birkbeck College, University of London, London, United Kingdom; The long-term scientific benefits of a space economy. Space Policy, 37, 58–61. doi:10.1016/j.spacepol.2016.07. (AG DebateDrills)

2.1. Economic benefits of using space resources in space to build, provision, and maintain scientific instruments and outposts It has long been recognized that future space exploration activities would benefit from utilising extraterrestrial resources wherever possible (an application known as In Situ Resource Utilisation, or ISRU), as this would avoid having to lift them out of Earth's gravity [4,7,10e12]. For example, scientific outposts on the Moon and Mars would benefit from using indigenous water resources (e.g. for drinking, personal hygiene, and as a source of both hydrogen and oxygen). Similarly, future space stations, satellites (including, in the present context, the next generation of large space telescopes), and space probes to the outer solar system would benefit if the hydrogen and oxygen needed for rocket fuel (as well as oxygen to breath if human crews are involved) could be sourced in space (e.g. from the lunar poles [8,13] or from hydrated asteroids [14,15]). For such applications, it is not the intrinsic value of the resources themselves that are scientifically enabling but the economic savings resulting from reduced launch masses from Earth. As Drmola and Mares [16] succinctly put the case for ISRU: “It is not the prospect of procuring something we covet here on the surface of the Earth that makes this venture attractive, but rather the idea of not having to wage an expensive battle with Earth's gravity each time we want to make use of something as mundane as water in space.” 2.2. Scientific discoveries made in the course of resource prospecting/extraction Companies engaged in prospecting for exploitable raw materials elsewhere in the solar system will inevitably rely on the knowledge and technical expertise of the planetary science community. However, by the same token, planetary science will learn much from this prospecting activity owing to improved access to a wider range solar system bodies (e.g. comets, asteroids, and lunar and planetary surfaces) than would otherwise occur (see the discussion summarised in Ref. [4]). This will greatly increase opportunities for making in situ measurements, and for returning a diverse range of samples to Earth for analysis, all of which will increase our understanding of the origin and evolution of the Solar System. There is a clear analogy here with the symbiotic relationship which exists between the geological sciences and the resource extraction industries on Earth e the latter needs the expertise of the former in order to locate economically exploitable resources, but the former also benefits from discoveries made, and techniques developed, by the latter. The same dynamic is sure to play out in space as the economic development of the solar system proceeds.

#### A human mission to Mars is key to inspiring a new generation of scientists and engineers

Ehlmann et al 05—Bethan Ehlmann [California Institute of Technology | CIT · Division of Geological and Planetary Sciences]; Humans to Mars: A feasibility and cost-benefit analysis; May 2005 Acta Astronautica 56(9-12):851-8; 10.1016/j.actaastro.2005.01.010. (AG DebateDrills)

Educating and inspiring America’s youth has long been a priority of NASA. Hence, we investigate the likely effects of a human mission to Mars on education in the United States. The Bureau of Labor predicts a 20% employment increase in engineering and a 15% increase in the physical sciences in the next 10 years, but as the Hart–Rudman Commission report states simply, the “US need for the highest quality human capital in science, mathematics, and engineering is not being met” [10]. In physics and advanced mathematics, American seniors score significantly below the international average on tests. While this is usually attributed to problems within the schools themselves, a general disinterest in math and science also contributes to American high school students’ poor performance. The trend continues at the undergraduate level. Comparing degrees granted between 1975 and 1999, the United States has a poor percentage increase compared to other nations. This decline is also reflected in the downward trend of the US relative to other nations in science and engineering degrees granted per capita to 24-year-olds [10]. At the graduate level, it is apparent that the number of doctoral degrees in natural sciences and engineering attained in Europe and Asia has increased rapidly compared to that of the United States. In 1975, the US granted approximately13,000 science and engineering doctoral degrees compared to Europe’s 7,000 and Asia’ 4500. In 1999, the US granted approximately18,000 science and engineering Ph.D.s while Europe granted 23,000 and Asia 19,000 [10]. Additionally, within US universities, 25% of graduate students in the sciences and nearly 40% of the graduate students in engineering, mathematics, and computer science are foreign born [10]. Based on this data, we see that decreasing production of scientists and engineers is not a global trend, but an area of particular concern for policy-makers in the United States. Some argue that money put into the space program could be better spent by putting it directly into the educational system to encourage students in the sciences and engineering. This is an unfortunate misconception. The United States is already one of the top spenders per student in the world [10]. Although more funding could always be useful to the American educational system, it does not promise the sustained effort needed to increase the number of Americans pursuing advanced degrees in science or engineering. The government cannot simply buy more computers, fund more scholarships, and lower teacher-to-student ratios enough to convince an 18-year-old freshman to invest at least 8 years in the pursuit of a science and engineering advanced degree. Students need something to inspire their efforts. The idea of space exploration significantly influencing youth is not without precedent. During the Apollo era of the 1960s, there was a dramatic increase in the number of American students pursuing advanced degrees in science, math, and engineering shortly after President Kennedy’s initiation of the Apollo program (Fig. 1). Furthermore, after the Apollo program was dismantled and NASA’s funding cut, the number of students going into these fields decreased with a down-ward trend of NASA’s budget. The figure is only a correlation; numerous other significant historical events, including the Vietnam War, also occurred at this time. However, anecdotal accounts of science and engineering professionals entering their disciplines inspired by the Apollo program “To the Moon” goal indicate how NASA can inspire a generation. Indeed, “To inspire the next generation of human explorers” [11] is the most compelling reason for the US policy-makers to support a human mission to Mars. The United States counts on advanced technology for economic stability and national security, which in turn depends on the ability of American universities to supply the science and engineering workforce. As the technological demands of the American lifestyle steadily increase, inspiration of the next generation of scientists and engineers becomes critical. A human mission to Mars has the unique ability to invigorate future scientists and engineers and create a program that operates in tandem with existing educational programs, adding an inspirational vision to supplement the efforts of teachers.

#### Scientific and engineering education key to preventing Climate Change – providing students facts, skills, and motivation to take action.

Dyster 13--Adam Dyster is a National Organizer for @serauk, Labour's Environment Campaign,Climate Home, 2013 (“Education is the key to addressing climate change, September 7, 2013, http://www.climatechangenews.com/2013/07/09/comment-education-is-the-key-to-addressing-climate-change/,Accessed 6-26-2017, AIN)

Education is vitally important for several, key reasons. It can deliver the scientific facts about the biggest issue facing young people, something that is being felt by millions worldwide. It equips youth with the skills to help combat climate change, and be part of a green recovering, and positive future. It also encourages young people to be involved as global citizens, and involves and engages them in an issue that’s impacts will be felt most keenly by those now going through the education system. We have a responsibility to educate, not only bound by international convention, but by moral and ethical duties. Schools must educate young people about the world around them, so that they are informed with facts and key issues. Education should keep up to date with science and academic thought. Just as the facts and science of stem cell research or alcohol abuse are taught, because of their relevance and strong scientific foundations, so should climate change and sustainability – indeed, even more so, given the magnitude and impact of environmental issues. Facts not fiction Such education must be about facts and science, not treated as the political football as it so often is. Such politicisation mires the issue, and means that the urgency and relevancy of climate change education is often lost amidst political point scoring. This should, as with other relevant science-based issues, be an area of consensus, not party political manoeuvring. Beyond establishing the facts of the issue, education can have be a great force for good, preparing young people to face, and indeed improve, the world after education has long been completed. How can we expect creative solutions and innovation to combat climate and sustainability issues if we don’t educate the next generation about them? The UK campaign against the removal of climate change from the Geography curriculum is itself proof of the power of education. Esha Marwaha, at 15-years-old, was able to write so eloquently on the dangers of removing climate change that her petition gained over 30,000 signatures in a matter of weeks. Yet without education, would we get another Esha, or another generation of activists, or even another generation who care about climate change. Without education, those who want or who’re able to combat climate change will surely be in the minority. New jobs This is especially relevant with the need for innovation and sustainable development. Currently the green economy is nascent, its burgeoning growth providing employment and a viable alternative to resource hungry industries and economic models. But positive growth needs new generations who both understand the need for alternative development and have the passion and desire to act. Education has a key role in showing young people that not only do they have wider responsibilities, but also that they are entitled to involvement in decisions. Climate change and sustainability are issues that cut across generations, and the decisions that are made today will have impact not upon the generation that makes them, but generations to come.1 Education can help give young people the tools to take part in these decisions, allowing them to enter into the debate. UN agreements Finally, there is a legal obligation for many countries to educate about climate change. Under Article 6 of the UN’s Framework Convention on Climate Change, signatories are obliged to: ‘Promote and facilitate …the development and implementation of educational and public awareness programmes on climate change and its effects’. This article is clear and direct, and must not be ignored. However in many respects this legal obligation is a lesser consideration when compared to the moral obligation each generation has to educate the next about climate change. Education is the most powerful tool and can engage young people in the debate, prepare them for working with the green economy, and give the definitive science and facts about the biggest issue facing young people. To quote H.G. Wells: “Human history becomes more and more a race between education and catastrophe.”

#### The impact is extinction—only quickly finding solutions prevents us from reaching tipping points

Sears 21-- Sears, Nathan Alexander. "Great Powers, Polarity, and Existential Threats to Humanity: An Analysis of the Dis-tribution of the Forces of Total Destruction in International Security." (2021).

Thus, the assumption here is that a Hothouse Earth climate could pose an existential threat to the habitability of the planet for humanity (Steffen et al. 2018., 5). At what point could climate change cross the threshold of an existential threat to humankind? The complexity of Earth’s natural systems makes it extremely difficult to give a precise figure (Rockstrom et al. 2009; ). However, much of the concern about climate change is over the danger of crossing “tipping points,” whereby positive feedback loops in Earth’s climate system could lead to potentially irreversible and self-reinforcing “runaway” climate change. For example, the melting of Arctic “permafrost” could produce additional warming, as glacial retreat reduces the refractory effect of the ice and releases huge quantities of methane currently trapped beneath it. A recent study suggests that a “planetary threshold” could exist at global average temperature of 2°C above preindustrial levels (Steffen et al. 2018; also IPCC 2018). Therefore, the analysis here takes the 2°C rise in global average temperatures as representing the lower-boundary of an existential threat to humanity, with higher temperatures increasing the risk of runaway climate change leading to a Hothouse Earth. The Paris Agreement on Climate Change set the goal of limiting the increase in global average temperatures to “well below” 2°C and to pursue efforts to limit the increase to 1.5°C. If the Paris Agreement goals are met, then nations would likely keep climate change below the threshold of an existential threat to humanity. According to Climate Action Tracker (2020), however, current policies of states are expected to produce global average temperatures of 2.9°C above preindustrial levels by 2100 (range between +2.1 and +3.9°C), while if states succeed in meeting their pledges and targets, global average temperatures are still projected to increase by 2.6°C (range between +2.1 and +3.3°C). Thus, while the Paris Agreements sets a goal that would reduce the exis 6 - tential risk of climate change, the actual policies of states could easily cross the threshold that would constitute an existential threat to humanity (CAT 2020). How do the CO2 emissions of the leading states affect the existential risk of climate change? One way to measure this would be to compare the leading states’ CO2 emissions against the global “carbon budget”—or the amount of CO2 emissions over a period of time that would keep global average temperature below the existential threshold of +2.0°C above preindustrial levels (IPCC 2018). If any of the leading state’s CO2 emissions—existing or projected—are equal to the global carbon budget, then this would constitute an absolute existential threat capability. None of the leading states appear to possess such an absolute existential threat capability. For example, the benchmark of total global annual CO2 equivalent emissions for a +2.0°C “compatible pathway” are 46 billion tonnes (bt) in 2025 and 38bt in 2030 (CAT 2020). China’s CO2 emissions are by far the largest amongst the leading states, which amounted to 10.17bt in 2019 and are expected to climb to somewhere below 15bt in the period between 2025 and 2030. China’s emissions are therefore far below the global carbon budget. Similarly, one 2019 study by the International Energy Agency estimated a remaining global carbon budget of 880 billion tonnes for having a 66% change of remaining well below 2.0°C (or 1.8°C) (Dalman 2020). Assuming China’s CO2 emissions were to remain on average at their current levels of approximately 10bt per year over the next 40 years until reaching China’s goal of “carbon neutrality” by 2060, China’s total emissions would still account for less than half of the global carbon budget. It is therefore highly unlikely that any 7 one of the leading states meets the threshold of CO2 emissions that would constitute an absolute existential threat capability, since no single state realistically accounts for the entire global carbon budget.

## Case

### Toplevel

#### Outer Space Laws are unclear – private corporations are still capable of escaping due to loopholes in the plan.

**Green and Stark 17** [Christopher and Eda, “Outer Space Treaty and Beyond: Do Existing Space Laws Put an Astronomical Barrier to Private IP Rights in Space?”, JDSUPRA. 8 September 2020 https://www.jdsupra.com/legalnews/outer-space-treaty-beyond-do-existing-44028/] //DebateDrills LC

Our **limited body of space law provides little guidance**. The first international treaty, the “Outer Space Treaty,” was signed by the U.S., Russia, and the U.K. in 1967, quickly followed by the Rescue Agreement. Over the next two decades, three other treaties—the Liability Convention, the Registration Convention, and the Moon Agreement—were also signed by these nations, with most countries following in their footsteps.[3] But after that rapid succession of international treaties, there have since been few others. These five documents form the basis of the international space law we have today, but **none address the issue of**[**intellectual property rights in space**](https://www.fr.com/fish-litigation/ip-rights-outer-space/). Rather, upon inspection, it appears that **the stated purpose of these treaties may be antithetical to intellectual property protection.**

The “Outer Space Treaty” espouses communal themes in characterizing space as the “province of all mankind,” the “common heritage of mankind” and to the “benefit of all countries.”[4] Unsurprisingly, Article II of the Outer Space Treaty prohibits any appropriation of areas in space, keeping in line with its principle of communal property.[5] On the other hand, **patents are fundamentally territorial and grant monopoly rights for a period of time. Applied to space, it is unclear just what is open for patent protections.**

For example, **can private companies patent orbital patterns of satellites**? Currently, companies may patent the technology or design of satellites that stay in a particular orbit, even if not the orbital pattern itself.[6] The practical implications of this are significant, especially with the advent of satellite constellations. If particular satellite technologies, and, indirectly, their orbital patterns, are patentable, then a significant portion of space may be occupied by one satellite constellation, i.e. one company alone.[7] Does this private apportionment of space run counter to our notions of sharing space? Some argue that **the Outer Space Treaty only bans sovereign appropriation and does not limit private entities from exerting claims**. Others counter that private property rights flow from sovereign property claims, so the former is meaningless without the latter.[8] So the question remains, **can the stated goals of sharing outer space be reconciled with the proprietary nature of patents**?

**Our current corpus of space treaties comes from a period of history when space exploration was undertaken primarily by governments** rather than private actors. The cooperative goals were likely a reaction to the time, as the world was coming out of a charged space race. **The silence of these space treaties on intellectual property rights presents an opportunity for modern-day agreements to provide patent protections for private companies**. Without robust international agreement on patents for space, we may even see less international cooperation as companies refuse to divulge their discoveries.[9] Now, as more and more private companies enter space exploration and carry the torch of innovation, **it is more important than ever to strike a balance between sharing our “common heritage” and providing patent protections that incentivize invention.**[10]

#### The affirmative has no enforcement mechanism – private corporations can just circumvent since they have the funding to launch rockets on their own.

**Sheetz 21** [Michael, “Elon Musk’s SpaceX raised about $850 million, jumping valuation to about $74 billion”, CNBC. 16 February 2021. https://www.cnbc.com/2021/02/16/elon-musks-spacex-raised-850-million-at-419point99-a-share.html] //DebateDrills LC

**SpaceX completed another monster equity funding round of $850 million last week**, people familiar with the financing told CNBC, sending **the company’s valuation skyrocketing to about $74 billion.**

**The company raised the new funds at $419.99 a share**, those people said — or just 1 cent below the $420 price that [Elon Musk](https://www.cnbc.com/elon-musk/) [made infamous in 2018](https://www.cnbc.com/2018/09/28/sec-says-elon-musk-at-tesla-chose-420-price-as-pot-reference.html) when he declared **he had “funding secured” to take**[**Tesla**](https://www.cnbc.com/quotes/TSLA)**private** at that price.

The latest round also represents **a jump of about 60% in the company’s valuation** from its previous round in August, when [S**paceX raised near $2 billion at a $46 billion valuation**](https://www.cnbc.com/2020/10/14/tesla-investor-ron-baron-spacex-has-a-chance-to-be-just-as-large.html).

SpaceX did not immediately respond to CNBC’s request for comment. In addition to SpaceX further building a war chest for its ambitious plans, **company insiders and existing investors were able to sell $750 million in a secondary transaction**, one of the people said.

The people spoke on condition of anonymity because SpaceX is not a publicly traded company and the fundraising talks were private. SpaceX raised only a portion of the funding available in the marketplace, with one person telling CNBC that **the company received “insane demand” of about $6 billion in offers over the course of just three days**.

### A2 Space Debris

#### The space junk has been put there by PUBLIC entities like governments as well as private entities, even a ban on private entities in space couldn’t solve the problem. As long as anyone is launching anything it is inevitable

**Polyakov 21**, Dr. Max Polyakov, Founder, Noosphere Ventures, Firefly Aerospace, EOS Data Analytics, 5-5-2021, "Where does space junk come from – and how do we clean it up?," World Economic Forum,<https://www.weforum.org/agenda/2021/05/why-we-need-to-clean-up-space-junk-debris-low-earth-orbit-pollution-satellite-rocket-noosphere-firefly/> Livingston RB

Where does space junk come from? **As long as humans launch objects into orbit, space debris is inevitable.** Rocket launches leave boosters, fairings, interstages, and other debris in LEO. So do rocket explosions, which currently account for seven of the top 10 debris-creating events. **Human presence also creates orbital flotsam** – such as cameras, pliers, an astronaut’s glove, a wrench, a spatula, even a tool bag lost during space walks. Some debris is created naturally from the impacts of micrometeoroids – dust-sized fragments of asteroids and comets. With limited lifetimes, **operational satellites can become space debris**. Satellites run out of maneuvering fuel, batteries wear out, solar panels degrade – causing an orbital debris feedback loop, in which the problem is exacerbated when solar panels are sandblasted by micrometeoroids and tiny debris. As with rocket debris, spent satellites eventually re-enter Earth’s atmosphere and burn up, but the process can take years – and the higher they orbit above Earth, the longer those orbits take to decay.

#### Attacks don’t escalate

Lewis, 13 – Senior fellow and Program Director at the Center for Strategic and

International Studies

James A. Lewis, “Reconsidering Deterrence for Space and Cyberspace,” in Anti-satellite Weapons, Deterrence and Sino-American Space Relations, September 2013. <https://apps.dtic.mil/dtic/tr/fulltext/u2/a587431.pdf>

Unlike other military technologies, nuclear weapons pose an existential threat. If used, damage and casualties would be massive. In contrast, neither cyberattacks nor ASAT attacks pose the same level of destructiveness; they certainly are not existential threats. If there was some way credibly to threaten the use of nuclear weapons after a cyberattack, deterrence might be possible. However, a nuclear threat in response to these attacks would not be proportional and the threat to use nuclear weapons is likely to be discounted by opponents. There are powerful norms that constrain the use of these weapons, and therefore, a threat to use nuclear weapons in response to cyberattacks would be dramatic but not credible. Calls for a nuclear response to cyberattacks would be dismissed as frivolous. Threats to use military force to retaliate against an act that would not be considered as justifying the use of force in self-defense under international law or practice will likely be dismissed by opponents as bluster.

### AT Asteroid Mining Bad

#### Asteroid mining is key to sustaining our world after we run out of resources.

**Elvis 21** [Martin (senior astrophysicist at the Center for Astrophysics, Harvard and Smithsonian), “Riches in Space”, Vox. 2 July 2021. https://aeon.co/essays/asteroid-mining-could-pay-for-space-exploration-and-adventure] //DebateDrills LC

What can we actually do with asteroids? That brings us to my favourite thing about them: their resources. Being an idealistic astrophysicist, my interest is in the money to be made from them. That really is idealistic because, **if we can make a profit mining the asteroids, then doing bigger things in space will become a lot cheaper**. **Capitalism has its faults, but one thing it does well is to make things cheaper.** I want to use it as a tool so that we can build far bigger telescopes than we could practically realise today. What do astronomers want? More light! Bigger telescopes! Asteroid mining could make that dream a reality.

The siren call of asteroids for miners is that **the Main Belt asteroids contain vast amounts of resources.** **The iron found in asteroids adds up to some 10 million times the iron that we have in proven reserves on Earth**. That’s a lot. It’s enough to build many rings of iron girders all the way around Earth’s orbit, along the lines of the science fiction novel Ringworld (1970) by Larry Niven. Not that a ringworld is a sensible thing to make, but it is a really big ring. More plausibly, with that much iron we could build cities in space, as envisaged by the physicist Gerard K O’Neill in the 1970s. Each of these cities would be big enough for a million people to live in. They would be rotating cylinders, and as a citizen of one you would be walking around inside the cylinder’s surface, feeling a fake gravity from the centrifugal force. **That’s the scale of resources we’re talking about.**

**These vast material supplies could make for an era that people call ‘post-scarcity’, where there’s plenty for everyone**, just as there is in the 23rd century of the Star Trek science fiction franchise. **The starship crew on Star Trek don’t work to keep themselves fed and housed, that’s taken for granted. They work for adventure and exploration. Asteroid wealth could help all of us take a step towards that happy state.**

The problem is how to get started. Iron in space is not going to make for giant profits in the short run. On the ground, it sells for less than $200 a ton. It would be worth more in space, but unfortunately there’s no one to buy huge tonnages of iron in space. To adapt the tagline from the Alien movies – ‘In space, no one can hear you sell.’ It certainly isn’t worth bringing space iron back to Earth since the cost of doing so would far exceed the price it could command. Starting to mine space for resources will have to begin with something so valuable that the cost of obtaining it in space is small by comparison. For now, **the best bets are precious metals and – surprise – water.**

**Precious metals are obvious**. Platinum sells for about $33.5 million a ton, and we know from meteorites that some asteroids are richer in platinum than any mine on Earth. That sounds promising. Platinum sales run at about 200 tons, or billions of dollars, per year. The bad news is that ‘richer than any mine on Earth’ is still concentrations of just tens of grams per ton, and extracting those precious grams isn’t easy. We can’t just bring an asteroid near to Earth to start extracting the platinum where we can have heavy machinery to work on it. That would take way too much fuel because, to carry more mass, rockets have to carry exponentially more fuel; unlike airplanes, they don’t get the oxygen for free from their surroundings, they have to pull it along with them. Any refining of platinum will have to be done robotically out in the native orbit of the asteroid. That’s quite a challenge.

Water is a less obvious money-maker. **The surprise is that water is also worth millions per ton** – if it’s sold in space. **Water in space is really useful**. It’s good for drinking, and the oxygen in it is good for breathing. You can split the hydrogen from the oxygen in H2O and you’ve got rocket fuel, and water is good at absorbing radiation to protect people from cancer-causing cosmic rays. So, in principle, **water in orbit is pretty valuable. The good news is that up to 10 per cent of a water-rich asteroid can be water.** It won’t be simple ice, most likely, but will be bound into clays and other rocks. Even better, **water is much easier to extract than precious metals**. Simply heating up the rock will release water that can then be captured.

#### Space mining key to supplying the future world.

**Duran 21** [Paloma, “Is Space Mining the Best Option to Face Climate Change?”, Mexico Business. 03 November 2021. https://mexicobusiness.news/mining/news/space-mining-best-option-face-climate-change]//DebateDrills LC

**Going to net zero means that more mining is needed**. Experts have said that **the current supply cannot support the necessary metals demand for the green transition**. As a result, **new mining alternatives have gained greater relevance, among them is space mining**. Several countries, including Mexico, have shown their interest in this alternative, creating a new space race.

“**The solar system can support a billion times greater industry than we have on Earth**. When you go to vastly larger scales of civilization, beyond the scale that a planet can support, then the types of things that civilization can do are incomprehensible to us … **We would be able to promote healthy societies all over the world at the same time that we would be reducing the environmental burden on the Earth,**” said Dr. Phil Metzger, Planetary Scientist at the University of Central Florida.

Currently, there are several attempts to address global warming and transition to a net zero carbon economy. **There has been an increasing interest in renewable energy and infrastructure, which has increased demand for various minerals**, especially lithium, cobalt, nickel, copper **and rare earth elements**. However, according to experts, **the world is close to entering a metals supercycle, where demand will exceed available supply, causing prices to skyrocket.**

Consequently, the mining industry has sought alternatives to achieve the required supply. Options include recycling and improved mine waste management, sea mining and space mining. The latter is considered one of the alternatives with the greatest potential. However, **a regulatory framework is still lacking and there is almost no experience in this regard.**

Despite the lack of knowledge regarding **space mining**, it **has become a very attractive option since the planet is running out of resources.** While some people believe that land-based mining is cheaper than space mining, experts believe this may change in the long term. Furthermore, **within the solar system there are countless bodies rich in minerals, ores and elements that will accelerate the fight against climate change.**

“There will come a point when th**ere is nothing left to mine on the surface, prompting mines to reach even further below. But even those resources are destined to run out** and so we will aim toward ocean mining, which already has specific technologies that are being developed. Nevertheless, even those mines are limited as well. **The mine of the future**, which today may seem unlikely**, will no longer be on our planet**. There will be a time when space mining will be as common as an open leach mine,” Eder Lugo, Minerals Head at Siemens, told MBN.

More than 150 million asteroids measuring approximately 100m are believed to be in the inner solar system alone. In addition, **astronomers have** also **identified abundant minerals near the Earth’s space and the Main Asteroid Belt.** There are three main groups into which asteroids are divided: C- type, S- type, and M- type. The last two groups are the most abundant in minerals such as gold, platinum, cobalt, zinc, tin, lead, indium, silver, copper and rare earth metals.

"**Energy is limited here**. Within just a few hundred years, you will have to cover all of the landmass of Earth in solar cells. So, what are you going to do? Well, what I think you are going to do is you are going to move out in space … **all of our heavy industry will be moved off-planet and Earth will be zoned residential and light-industrial**,” said Jeff Bezos, Founder of Amazon and the Space Launch Provider Blue Origin.

#### Space mining produces less carbon emissions than mining on Earth.

**MIT Tech Review 18** [ “Asteroid mining might actually be better for the environment”, MIT Technology Review. 19 October 2018. https://www.technologyreview.com/2018/10/19/139664/asteroid-mining-might-actually-be-better-for-the-environment/] //DebateDrills LC

Hein and co use these numbers to calculate that **a kilogram of platinum mined from an asteroid would release some 150 kilograms of CO2** into Earth’s atmosphere. However, **economies** of scale from large asteroid-mining operations **could lower this to about 60 kilograms of CO2 per kilogram of platinum.**

**That needs to be compared with the emission from Earth-based minin**g. Here, **platinum mining generates significant greenhouse gases,** mostly from the energy it takes to remove this stuff from the ground.

Indeed, the numbers are huge. The mining industry estimates that **producing one kilogram of platinum on Earth releases around 40,000 kilograms of carbon dioxide**. “The global warming effect of Earth-based mining is several orders of magnitude larger,” say Hein and co.

The figures for water are also encouraging. In this case, **the authors calculate the greenhouse-gas emissions from an asteroid-mining operation that returns water to anywhere within the moon’s orbit**, a so-called cis-lunar orbit.  They compare this to the emissions from sending the same volume of water from Earth into orbit.

The big difference is that a water-carrying vehicle from Earth can haul only a small percentage of its mass as water. But **an asteroid-mining spacecraft can transport a significant multiple of its mass as water to cis-lunar orbit**. “Substantial savings in greenhouse gas emissions can be achieved,” say Hein and co.

**This interesting work should** help to **focus minds on the environmental impacts of mining**, which are rapidly increasing in profile**. But it is only a first step**. There is significant uncertainty in the numbers here, so these will need to be better understood.