## FW

#### The standard is maximizing expected wellbeing.

#### Prefer it:

#### 1] Actor specificity:

#### A] Aggregation – every policy benefits some and harms others, which also means side constraints freeze action.

#### B] No act-omission distinction – choosing to omit is an act itself – governments decide not to act which means being presented with the aff creates a choice between two actions, neither of which is an omission

#### C] No intent-foresight distinction – If we foresee a consequence, then it becomes part of our deliberation which makes it intrinsic to our action since we intend it to happen

o/w

#### 2] Lexical pre-requisite: threats to bodily security preclude the ability for moral actors to effectively act upon other moral theories since they are in a constant state of crisis that inhibits the ideal moral conditions which other theories presuppose

#### 3] Only consequentialism explains degrees of wrongness—if I break a promise to meet up for lunch, that is not as bad as breaking a promise to take a dying person to the hospital. Only the consequences of breaking the promise explain why the second one is much worse than the first. Intuitions outweigh—they’re the foundational basis for any argument and theories that contradict our intuitions are most likely false even if we can’t deductively determine why.

## 1

#### Private sector innovation in the commercial space industry is high and rising.

**Smith 18** [Matthew Smith, 6-11-2018, "Commercialized Space and You," Science in the News, https://sitn.hms.harvard.edu/flash/2018/commercialized-space-and-you/]//DDPT

Step aside, NASA. The 20th century model of space exploration is running out of fuel, and private companies are now leading the race for human expansion across the galaxy. Elon Musk, Richard Branson, and Jeff Bezos are three of the billionaires leading this extraterrestrial adventure with their respective companies, SpaceX, Virgin Galactic, and Blue Origin. Bezos, the founder of Amazon and currently the wealthiest person in the world, has a vision of sending autonomous rovers to the Moon and helping to eventually create a Moon Village. He has explained that collaborations with the National Aeronautics and Space Administration (NASA) and other government agencies are encouraged and appreciated, but are no longer essential to achieve his goal. [Musk](https://www.geekwire.com/2018/jeff-bezos-blue-origin-space-venture-go-moon-settlements/), who co-founded Tesla, has already launched nine rockets within the first five months of 2018, one of which was the most powerful private spacecraft [ever sent into orbit](http://sitn.hms.harvard.edu/flash/2018/spacex-launches-falcon-heavy-rocket-successfully/). Looking forward, SpaceX aims to complete its first manned mission to Mars in 2024, almost a decade earlier than NASA’s projections. Even the current US president is encouraging this shift to private companies driving [innovation in space](https://www.washingtonpost.com/news/the-switch/wp/2018/02/11/the-trump-administration-wants-to-turn-the-international-space-station-into-a-commercially-run-venture/?noredirect=on&utm_term=.d2c1eccab4ca). With almost [$1 billion](https://www.forbes.com/sites/alexknapp/2018/04/10/nearly-1-billion-was-invested-in-space-startups-in-1q2018-new-report-says/#5fdd019b285c) invested in space-focused startups in the first quarter of 2018, the commercialized space industry shows no sign of slowing down.

#### There is a massive flood of investment pouring into the commercial space sector because of a signal of stable large company support AND lack of government interference – plan reverses that

Wharton 19 (Wharton Editorial Board of University of Pennsylvania, business analysis journal online run through U Penn, "Why Big Business Is Making a Giant Leap Into Space," 6/4/2019 <https://knowledge.wharton.upenn.edu/article/commercial-space-economy/> DD)

For decades, relatively easy access to space and the big profits to go with it have dangled elusively just over the horizon. With a little more R&D money and a few more advances in the technology, the thinking went, space would be ours. Are we there yet? More than a few signs are pointing in the direction of a robust, varied space age of viable commercialization — as well as more audacious goals than we’ve seen in generations. On the practical side, advances in reusable rockets, lowered per-launch costs and miniaturization of satellites are opening up business opportunities well beyond aerospace and defense, and into IT hardware and telecom, according to Morgan Stanley. The global space industry is expected to generate revenue of $1.1 trillion or more in 2040, up from the current $350 billion, according to a recent report by the firm. On the dream side, Amazon founder Jeff Bezos recently outlined a long-term vision for putting a trillion people in space colonies with one small step coming soon: an infrastructure starting with lunar lander Blue Moon. “We are going to build a road to space,” Bezos said at a May unveiling of his plans, “and then amazing things will happen.” Amazing things already are. One indication that big business is taking space more seriously is that interest has moved from the fringe to the mainstream, says Wharton management professor Anoop Menon. While space retains an undeniably speculative aspect, especially around development of business models, a number of factors are coming together now to suggest that big business’s foray into space is here. “I don’t think we are necessarily a long way away — it’s a matter of being creative,” said Menon, co-author with Laura Huang and Tiona Zuzul of “Watershed Moments, Cognitive Discontinuities, and Entrepreneurial Entry: The Case of New Space.” Satellites that capture geospatial data are potentially quite lucrative, he says, tracking shipping movements, deforestation or the location of mining deposits. “This is an interesting one,” says Menon of another idea: “Taking pictures of parking lots at Wal-Mart and Target and selling that to hedge funds, since traffic is a pretty good leading indicator of economic activity.” A sustainable business model for many is clearly the goal. For others, though, sustaining losses is a small price to pay for the pursuit of something larger and potentially more meaningful. Bezos, for instance, has said he is willing to sell a billion dollars of Amazon stock per year in exchange for adventure and knowledge in space. Says Nicolaj Siggelkow, Wharton management professor and co-director of the Mack Institute for Innovation Management: “The main driver for these people I think is much more an aspirational goal. Here we are clinging to this speck of dust moving through the universe and there is this idea that we might be able to escape that. That is ultimately what drives their wanting to succeed.” Space: Province of Billionaires Three individualistic billionaires — Bezos, Elon Musk and Richard Branson — have increasingly turned their attention in the last two decades to space, which is defined by NASA and other Earthlings as beginning at 50 miles above sea level. Last month, Musk’s SpaceX launched a rocket that released 60 500-pound satellites into orbit. SpaceX intends to launch others, creating Starlink, a web of satellites supporting a global internet service. “This ‘data-driven’ aspect when coupled with the rest of the space-industry ecosystem could make it more robust.”–Anoop Menon Thousands more satellites are being readied. Telesat LEO (low-earth orbit) will launch a “constellation of highly advanced satellites [to] seamlessly integrate with terrestrial networks,” trumpets the company’s promotional literature. “The global network will deliver fiber quality throughput anywhere on earth.” A partnership of OneWeb Satellites and Airbus will begin launching 900 satellites into low orbit in 2019 to deliver affordable global internet access. Amazon’s Project Kuiper will place 3,236 satellites into orbit with the stated intention of providing “low-latency, high-speed broadband connectivity to unserved and underserved communities around the world,” Amazon said in a statement to GeekWire. “Data is everything these days,” says Menon. “There are data companies whose business models are about processing the data that comes out of the satellites, and there is this whole set of companies coming up around this idea,” which is one reason he believes that the new space race is here to stay. “This ‘data-driven’ aspect when coupled with the rest of the space-industry ecosystem could make it more robust.” Back on Earth, demand for data only promises to increase with the proliferation of AI, development of self-driving vehicles, virtual reality and video. At the same time, costs for commercial applications are dropping for just about everything — hardware components, software development — enabled by using commercial technology and standard architectures, says Ellen Chang, co-founder of LightSpeed Innovations. “When costs have dropped by about 60% to 80% in whatever industry, I would say you have an opportunity. It started with the inception of the CubeSat, when different commercial off-the-shelf components were used instead of space-qualified components. Over time, more and more engineers adopted the form factor.” “Here we are clinging to this speck of dust moving through the universe and there is this idea that we might be able to escape that. That is ultimately what drives their wanting to succeed.”–Nicolaj Siggelkow Recently, the cost of launching a satellite has declined to about $60 million from $200 million because of reusable rockets, reports Morgan Stanley, with a potential drop to as low as $5 million. Satellite mass production could decrease the cost from $500 million per satellite to $500,000. But more data and better internet service are just the beginning. Companies like Bigelow Aerospace are developing orbital space stations. Axiom Space has staked out plans to build the first international commercial space station — with a Philippe Starck-designed interior — that aims to be a “microgravity laboratory where educators, scientists and researchers conduct life-improving research.” Other firms are chasing space tourism or mining asteroids for rare minerals. Morgan Stanley notes that privately held space exploration firms are pursuing goals like landing humans on the moon, as well as airplane-borne rocket launchers that could put small telecommunications satellites into low Earth orbit at a far lower cost, and with far greater responsiveness, than ground-based systems. “It used to be a space race between countries, and now it’s a space race between billionaires,” says Menon. “Musk is running SpaceX with the goal of colonizing Mars and making humanity a multi-planetary species. Bezos, with all of the might of Amazon behind him, is doing it with Blue Origin. He sees it very differently, a space-based civilization rather than colonizing planets, building space stations, and moving heavy industry off-planet, and he is slowly building the pieces for it.” “These far-out ideas — ‘let’s mine water on the moon, let’s build these big colonies out there’ — that to me I find fascinating and inspirational and aspirational,” says Siggelkow. “And I think that is what allows these firms to attract really good people. It is really cool to be working on something amazing, it’s how you attract great talent. Whether these big projects will become commercially attractive and at what point is another question, but that might be secondary to most people working on these projects.” “It used to be a space race between countries, and now it’s a space race between billionaires.”–Anoop Menon There are other reasons for pushing ahead with ideas that may seem pie-in-the-sky, says Wharton management professor David Hsu. “It’s like Google funding big science projects and trying to push the technology frontier,” he says. “That has a signaling purpose in the marketplace — ‘we may be making 99% of our money from your searches, but we are thinking about the future and pushing the frontier a bit.’ They are really trying to work on the harder problems, and maybe we haven’t thought of all of the uses for a particular technology in all cases. They are on the road toward that. You want to be able to show technological things that people didn’t necessarily understand were feasible or possible.” A certain amount of momentum for ideas hinges on perception, especially regarding a future for the space-tourism industry, Siggelkow notes. “We know this is a really complicated and to a certain extent dangerous endeavor, and the general public’s risk appetite is very low. Think about self-driving vehicles and accidents. At what point do we feel they are safe? There is something similar here. If something happens, I am afraid it will slow down space tourism quite a bit.” Branson’s Virgin Galactic has already suffered a visible tragedy. One pilot was killed and another injured in 2014 when experimental spaceflight vehicle VSS Enterprise broke up during a test flight and crashed in the Mojave Desert. Several other initiatives have failed, such as Israel’s Beresheet Spacecraft, which in April crashed into the moon. For now, investors are taking a relatively rosy view of the prospect of making money in space. In the first quarter of 2019, $1.7 billion in equity was invested into space companies — nearly the double the amount invested in the last quarter of 2018, according to Space Investment Quarterly, published by Space Angels. Total funding since 2009 exceeds $20 billion invested in 435 companies, the space-centric financial services firm says. “With SpaceX, Boeing, Virgin Galactic, and Blue Origin all inching closer to making history as the first privately funded companies to launch commercial passengers into space, we believe that 2019 will most certainly be the Year of Commercial Space Travel,” the report said. Rekindled Ambition In terms of the march of progress, mindset matters. In their research paper, Menon and his co-authors proposed that the New Space market was catalyzed by a set of “emotionally resonant” events. These moments — events like the 2003 Space Shuttle Columbia disaster, or when SpaceShipOne in 2004 became the first privately developed spacecraft to take a pilot into space twice within a two-week period — challenged or reinforced existing notions, and led to new solutions. “This, in turn, drove the emergence of a previously unimaginable market in aerospace,” they wrote. “It’s really relevant with the 50th anniversary of Apollo 11 to remember that it’s not easy to throw some resources at a problem and expect that it’s a given you will have success.”–David Hsu Menon says what while momentum lagged in recent years, the pace has now picked up — at NASA as well as in other countries. “The European Space Agency was in crisis mode because of the launch cost savings Musk achieved and the market share he was able to carve out so rapidly. In England, there is Reaction Engines. They have a very interesting concept, the Skylon Spaceplane, a single-stage-to-orbit plane that goes to space directly. India is interesting because they’ve been able to do a fair bit on a much lower budget. They got to Mars at a fraction of the price it took us to get there. The Chinese space program is a big part of their national prestige right now.”

#### Without that mass investment, all necessary space infrastructure is chilled – technology is all seen as linked to eventual deep space exploration

Sommariva 20 (Andrea, Italian Institute for International Political Studies, "The Evolution of Space Economy: The Role of the Private Sector and the Challenges for Europe," 12/11, <https://www.ispionline.it/en/pubblicazione/evolution-space-economy-role-private-sector-and-challenges-europe-28604> DD)

The second factor focuses on spacecraft and space-access costs. NASA has moved from a government-run International Space Station access system to one where the transportation of goods and people relies on private companies, obviously under contract and control of NASA, thus eliminating the monopoly of Lockheed Martin and Boeing. As a result, significant progress has been made in the design and development of cost-effective launch vehicles. Currently, SpaceX has developed a system to reuse the first stage of rockets, which serves to give the initial thrust necessary to overcome Earth's atmosphere. Normally, after doing its job, the first stage came off and fell into the ocean as waste. SpaceX has successfully developed the recovery and reuse of the first stages of rockets, reducing the cost per kilogram of payload by more than 50 percent. These developments provide access to space for many small and medium-sized companies, as well as educational and research institutions. In the near future, the development of the satellite Internet will allow people and companies to connect wherever they are - an effective alternative when terrestrial networks are absent or of poor quality. In addition, satellite technology gives rise to a growing stream of uses, including transportation and logistics efficiency, natural resource management, precision agriculture, environment and climate change monitoring, and makes it a potential source of economic growth, social well-being, and sustainable development. As for the exploration programs, the return to the Moon is now days on the agendas of the major space agencies, such as NASA and ESA. Over the next ten to fifteen years, the use of space resources will be crucial for the success of expeditions to the Moon and other planets. The Moon's resources provide propellant for the in-orbit refueling of spacecraft, reducing their costs[1], and oxygen and water for support systems of the future space station around the Moon (the Gateway project). A new form of public-private partnership is rising, a partnership in which governments will provide initial support in the exploration and the advancement of critical technologies (telecommunications and Moon-Earth navigation), and in the construction of space infrastructure. NASA plans a first exploration mission at the South Pole of the Moon in 2024. The private sector would then take the lead in creating new markets and expanding the presence of humanity in space. SpaceX is developing a vehicle, Starship, for missions to the Moon and beyond. The Starship is a fully reusable launch vehicle. It consists of two stages, the booster and the spacecraft, which in November 2018 Elon Musk renamed Super Heavy and Starship respectively. The overall vehicle architecture includes both the launcher and the vehicle, as well as the infrastructure for the first and subsequent launches, and zero-gravity propellant transfer’s technology. The spacecraft alone is designed to be used, in a first phase, without a booster for both freight and passenger transport. In April 2020, NASA selected a modified version of the Starship as one of three landing systems for the Artemis Program. Moon mining will present also an opportunity to make space based solar power (SBSP) economically feasible. SBSP has been studied for decades. However, the costs of launching such large infrastructure from Earth to geosynchronous orbit (GEO) make these projects economically not feasible. At the SEE Lab-SDA Bocconi, we have initiated a study where the basic idea is to build the SBSP satellite with material from the Moon and to transfer the components to GEO where they would be assembled. Its costs are comparable to a large-scale nuclear power plant. If preliminary results are confirmed by the completion of the study, space based solar power can transform the energy markets of Earth[2], and can give an important contribution to the climate change’s mitigation.

#### Strong commercial space industry catalyzes tech innovation – progress at the margins and spinoff tech change global information networks.

**Hampson 17** [Joshua Hampson, 1-27-2017, "The Future of Space Commercialization," Niskanen Center, <https://www.niskanencenter.org/wp-content/uploads/old_uploads/2017/01/TheFutureofSpaceCommercializationFinal.pdf>]//DDPT

Innovation is generally hard to predict; some new technologies seem to come out of nowhere and others only take off when paired with a new application. It is difficult to predict the future, but it is reasonable to expect that a growing space economy would open opportunities for technological and organizational innovation.

In terms of technology, the difficult environment of outer space helps incentivize progress along the margins. Because each object launched into orbit costs a significant amount of money—at the moment between $27,000 and $43,000 per pound, though that will likely drop in the future —each 19 reduction in payload size saves money or means more can be launched. At the same time, the ability to fit more capability into a smaller satellite opens outer space to actors that previously were priced out of the market. This is one of the reasons why small, affordable satellites are increasingly pursued by companies or organizations that cannot afford to launch larger traditional satellites. These small 20 satellites also provide non-traditional launchers, such as engineering students or prototypers, the opportunity to learn about satellite production and test new technologies before working on a full-sized satellite. That expansion of developers, experimenters, and testers cannot but help increase innovation opportunities.

Technological developments from outer space have been applied to terrestrial life since the earliest days of space exploration. The National Aeronautics and Space Administration (NASA) maintains a website that lists technologies that have spun off from such research projects. Lightweight 21 nanotubes, useful in protecting astronauts during space exploration, are now being tested for applications in emergency response gear and electrical insulation. The need for certainty about the resiliency of materials used in space led to the development of an analytics tool useful across a range of industries. Temper foam, the material used in memory-foam pillows, was developed for NASA for seat covers. As more companies pursue their own space goals, more innovations will likely come from the commercial sector.

Outer space is not just a catalyst for technological development. Satellite constellations and their unique line-of-sight vantage point can provide new perspectives to old industries. Deploying satellites into low-Earth orbit, as Facebook wants to do, can connect large, previously-unreached swathes of 22 humanity to the Internet. Remote sensing technology could change how whole industries operate, such as crop monitoring, herd management, crisis response, and land evaluation, among others. 23 While satellites cannot provide all essential information for some of these industries, they can fill in some useful gaps and work as part of a wider system of tools. Space infrastructure, in helping to change how people connect and perceive Earth, could help spark innovations on the ground as well. These innovations, changes to global networks, and new opportunities could lead to wider economic growth.

#### Tech innovation solves every existential threat – cumulative extinction events outweigh the aff

**Matthews 18** [Dylan Matthews, 10-26-2018, "How to help people millions of years from now," Vox, <https://www.vox.com/future-perfect/2018/10/26/18023366/far-future-effective-altruism-existential-risk-doing-good>]

If you care about improving human lives, you should overwhelmingly care about those quadrillions of lives rather than the comparatively small number of people alive today. The 7.6 billion people now living, after all, amount to less than 0.003 percent of the population that will live in the future. It’s reasonable to suggest that those quadrillions of future people have, accordingly, hundreds of thousands of times more moral weight than those of us living here today do.

That’s the basic argument behind Nick Beckstead’s 2013 Rutgers philosophy dissertation, “[On the overwhelming importance of shaping the far future](https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxuYmVja3N0ZWFkfGd4OjExNDBjZTcwNjMxMzRmZGE).” It’s a glorious mindfuck of a thesis, not least because Beckstead shows very convincingly that this is a conclusion any plausible moral view would reach. It’s not just something that [weird utilitarians](https://plato.stanford.edu/entries/consequentialism/) have to deal with.

And Beckstead, to his considerable credit, walks the walk on this. He works at the Open Philanthropy Project on grants relating to the far future and runs a [charitable fund](https://app.effectivealtruism.org/funds/far-future) for donors who want to prioritize the far future. And arguments from him and others have turned “long-termism” into a very vibrant, important strand of the effective altruism community.

But what does prioritizing the far future even mean?

The most literal thing it could mean is preventing human extinction, to ensure that the species persists as long as possible. For the long-term-focused effective altruists I know, that typically means identifying concrete threats to humanity’s continued existence — like unfriendly artificial intelligence, or a [pandemic](https://www.vox.com/future-perfect/2018/10/15/17948062/pandemic-flu-ebola-h1n1-outbreak-infectious-disease), or global warming/out of control geoengineering — and engaging in activities to prevent that specific eventuality.

But in a [set of slides](https://intelligence.org/wp-content/uploads/2013/07/Beckstead-Evaluating-Options-Using-Far-Future-Standards.pdf) he made in 2013, Beckstead makes a compelling case that while that’s certainly part of what caring about the far future entails, approaches that address specific threats to humanity (which he calls “targeted” approaches to the far future) have to complement “broad” approaches, where instead of trying to predict what’s going to kill us all, you just generally try to keep civilization running as best it can, so that it is, as a whole, well-equipped to deal with potential extinction events in the future, not just in 2030 or 2040 but in 3500 or 95000 or even 37 million.

In other words, caring about the far future doesn’t mean just paying attention to low-probability risks of total annihilation; it also means acting on pressing needs now.

For example: We’re going to be better prepared to prevent extinction from AI or a supervirus or global warming if society as a whole makes a lot of scientific progress. And a significant bottleneck there is that the vast majority of humanity doesn’t get high-enough-quality education to engage in scientific research, if they want to, which reduces the odds that we have enough trained scientists to come up with the breakthroughs we need as a civilization to survive and thrive.

So maybe one of the best things we can do for the far future is to improve school systems — here and now — to harness the group economist Raj Chetty calls [“lost Einsteins”](https://www.nytimes.com/2017/12/03/opinion/lost-einsteins-innovation-inequality.html) (potential innovators who are thwarted by poverty and inequality in rich countries) and, more importantly, the hundreds of millions of kids in developing countries dealing with even worse education systems than those in depressed communities in the rich world.

What if living ethically for the far future means living ethically now?

Beckstead mentions some other broad, or very broad, ideas (these are all his descriptions):

Help make computers faster so that people everywhere can work more efficiently

Change intellectual property law so that technological innovation can happen more quickly

Advocate for open borders so that people from poorly governed countries can move to better-governed countries and be more productive

Meta-research: improve incentives and norms in academic work to better advance human knowledge

Improve education

Advocate for political party X to make future people have values more like political party X

”If you look at these areas (economic growth and technological progress, access to information, individual capability, social coordination, motives) a lot of everyday good works contribute,” Beckstead writes. “An implication of this is that a lot of everyday good works are good from a broad perspective, even though hardly anyone thinks explicitly in terms of far future standards.”

Look at those examples again: It’s just a list of what normal altruistically motivated people, not effective altruism folks, generally do. Charities in the US love talking about the lost opportunities for innovation that poverty creates. Lots of smart people who want to make a difference become scientists, or try to work as teachers or on improving education policy, and lord knows there are plenty of people who become political party operatives out of a conviction that the moral consequences of the party’s platform are good.

All of which is to say: Maybe effective altruists aren’t that special, or at least maybe we don’t have access to that many specific and weird conclusions about how best to help the world. If the far future is what matters, and generally trying to make the world work better is among the best ways to help the far future, then effective altruism just becomes plain ol’ do-goodery.\*

## 2

#### Squo private companies are willing to invest, but the plan crosses a perception barrier which destroys investment

Shaw 13 - Lauren E, J.D. from Chapman University School of Law, ”Asteroids, the New Western Frontier: Applying Principles of the General Mining Law of 1872 to Incentive Asteroid Mining”, JOURNAL OF AIR LAW AND COMMERCE, Volume 78, Issue 1, Article 2, <https://scholar.smu.edu/cgi/viewcontent.cgi?article=1307&context=jalc> // recut MNHS NL

To some, the mining of asteroids might sound like the premise of a science fiction novel' or the solution to the heartwrenching, fictional scenario depicted in the film Armageddon.2 To others, it evokes a fantastical idea that may come to fruition in a distant reality. However, impressively funded companies have plans to send spacecraft to begin prospecting on asteroids within the next two years.' The issues associated with the mining of asteroids should be addressed before these plans are set in motion. Much has been written about the issues that might arise from allowing nations to own these space bodies and the minerals they contain; one such issue is the impact on international treaties.4 However, little has been written about the applicability of preexisting mining laws-which provide a basic property right scheme for the private sector-such as the General Mining Law of 1872 (Mining Law) to the management of asteroid mining.' The literature to date on how to legally address asteroid mining is minimal.' The articles that do address it propose the creation of different systems, such as a "property rights-based system that relies on the doctrine of first possession"7 or an international authority that would regulate mining operations.' Implementing a scheme that offers ownership of extracted resources without bestowing complete sovereignty is necessary to avoid an impending legal limbo-that is, an outer space "Wild West" equivalent where there is neither certainty nor security in who owns what.9 If private sector miners of asteroids know this right already exists, they will have more incentive to extract resources.' 0 This, in turn, would increase the chances of successful missions, resulting in numerous scientific and explorative benefits, along with the potential replenishment of key elements that are becoming increasingly depleted on Earth yet are still needed for modern industry. Scientists speculate that key elements needed for modern industry, including platinum, zinc, copper, phosphorus, lead, gold, and indium, could become depleted on Earth within the next fifty to sixty years." Many of these metals, such as platinum, are chemical elements that, unlike oil or diamonds, have no synthetic alternative.12 Once the reserves on Earth are mined to complete depletion, industries will be forced to recycle the existing supply of minerals, which will result in increased costs due to increased scarcity.' 3 However, evidence is accumulating that asteroids only a few hundred thousand miles away from Earth may be composed of an abundance of natural resources-including many of the minerals being mined to depletion on Earth-that could lead to vast profits." Most of the minerals being mined on Earth, including gold, iron, platinum, and palladium, originally came from the many asteroids that hit the Earth after the crust cooled during the planet's formation.'

#### Space mining is the only way to solve climate change

Duran 21, (Paloma Duran is a journalist and industry analyst at Mexico Business News, “Is Space Mining the Best Option to Face Climate Change?”), 11-03-21, Mexico Business News, https://mexicobusiness.news/mining/news/space-mining-best-option-face-climate-change // MNHS NL

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 there 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.

#### Anthropogenic warming causes extinction --- mitigation efforts now are key

Griffin, 2015 (David, Professor of Philosophy at Claremont, “The climate is ruined. So can civilization even survive?”, CNN, 4/14/2015, <http://www.cnn.com/2015/01/14/opinion/co2-crisis-griffin/> )

Although most of us worry about other things, climate scientists have become increasingly worried about the survival of civilization. For example, Lonnie Thompson, who received the U.S. National Medal of Science in 2010, said that virtually all climatologists "are now convinced that global warming poses a clear and present danger to civilization." Informed journalists share this concern. The climate crisis "threatens the survival of our civilization," said Pulitzer Prize-winner Ross Gelbspan. Mark Hertsgaard agrees, saying that the continuation of global warming "would create planetary conditions all but certain to end civilization as we know it." These scientists and journalists, moreover, are worried not only about the distant future but about the condition of the planet for their own children and grandchildren. James Hansen, often considered the world's leading climate scientist, entitled his book "Storms of My Grandchildren." The threat to civilization comes primarily from the increase of the level of carbon dioxide (CO2) in the atmosphere, due largely to the burning of fossil fuels. Before the rise of the industrial age, CO2 constituted only 275 ppm (parts per million) of the atmosphere. But it is now above 400 and rising about 2.5 ppm per year. Because of the CO2 increase, the planet's average temperature has increased 0.85 degrees Celsius (1.5 degrees Fahrenheit). Although this increase may not seem much, it has already brought about serious changes. The idea that we will be safe from "dangerous climate change" if we do not exceed a temperature rise of 2C (3.6F) has been widely accepted. But many informed people have rejected this assumption. In the opinion of journalist-turned-activist Bill McKibben, "the one degree we've raised the temperature already has melted the Arctic, so we're fools to find out what two will do." His warning is supported by James Hansen, who declared that "a target of two degrees (Celsius) is actually a prescription for long-term disaster." The burning of coal, oil, and natural gas has made the planet warmer than it had been since the rise of civilization 10,000 years ago. Civilization was made possible by the emergence about 12,000 years ago of the "Holocene" epoch, which turned out to be the Goldilocks zone - not too hot, not too cold. But now, says physicist Stefan Rahmstorf, "We are catapulting ourselves way out of the Holocene." This catapult is dangerous, because we have no evidence civilization can long survive with significantly higher temperatures. And yet, the world is on a trajectory that would lead to an increase of 4C (7F) in this century. In the opinion of many scientists and the World Bank, this could happen as early as the 2060s. What would "a 4C world" be like? According to Kevin Anderson of the Tyndall Centre for Climate Change Research (at the University of East Anglia), "during New York's summer heat waves the warmest days would be around 10-12C (18-21.6F) hotter [than today's]." Moreover, he has said, above an increase of 4C only about 10% of the human population will survive. Believe it or not, some scientists consider Anderson overly optimistic. The main reason for pessimism is the fear that the planet's temperature may be close to a tipping point that would initiate a "low-end runaway greenhouse," involving "out-of-control amplifying feedbacks." This condition would result, says Hansen, if all fossil fuels are burned (which is the intention of all fossil-fuel corporations and many governments). This result "would make most of the planet uninhabitable by humans." Moreover, many scientists believe that runaway global warming could occur much more quickly, because the rising temperature caused by CO2 could release massive amounts of methane (CH4), which is, during its first 20 years, 86 times more powerful than CO2. Warmer weather induces this release from carbon that has been stored in methane hydrates, in which enormous amounts of carbon -- four times as much as that emitted from fossil fuels since 1850 -- has been frozen in the Arctic's permafrost. And yet now the Arctic's temperature is warmer than it had been for 120,000 years -- in other words, more than 10 times longer than civilization has existed. According to Joe Romm, a physicist who created the Climate Progress website, methane release from thawing permafrost in the Arctic "is the most dangerous amplifying feedback in the entire carbon cycle." The amplifying feedback works like this: The warmer temperature releases millions of tons of methane, which then further raise the temperature, which in turn releases more methane. The resulting threat of runaway global warming may not be merely theoretical. Scientists have long been convinced that methane was central to the fastest period of global warming in geological history, which occurred 55 million years ago. Now a group of scientists have accumulated evidence that methane was also central to the greatest extinction of life thus far: the end-Permian extinction about 252 million years ago. Worse yet, whereas it was previously thought that significant amounts of permafrost would not melt, releasing its methane, until the planet's temperature has risen several degrees Celsius, recent studies indicate that a rise of 1.5 degrees would be enough to start the melting. What can be done then? Given the failure of political leaders to deal with the CO2 problem, it is now too late to prevent terrible developments. But it may -- just may -- be possible to keep global warming from bringing about the destruction of civilization. To have a chance, we must, as Hansen says, do everything possible to "keep climate close to the Holocene range" -- which means, mobilize the whole world to replace dirty energy with clean as soon as possible.

## CASE

#### “Appropriation” means to take as property which includes mining

This definition is 100x better than any neg evidence – it’s contextual to space mining and the OST. It also conducts a common-use analysis of the word and a historical analysis of the OST’s writing and concludes that both support that appropriation includes mining

Leon 18 (Amanda M., Associate, Caplin & Drysdale, JD UVA Law) "Mining for Meaning: An Examination of the Legality of Property Rights in Space Resources." Virginia Law Review, vol. 104, no. 3, May 2018, p. 497-547. HeinOnline.

Appropriation. The term "appropriation" also remains ambiguous. Webster's defines the verb "appropriate" as "to take to oneself in exclusion of others; to claim or use as by an exclusive or pre-eminent right; as, let no man appropriate a common benefit."16 5 Similarly, Black's Law Dictionary describes "appropriate" as an act "[t]o make a thing one's own; to make a thing the subject of property; to exercise dominion over an object to the extent, and for the purpose, of making it subserve one's own proper use or pleasure."166 Oftentimes, appropriation refers to the setting aside of government funds, the taking of land for public purposes, or a tort of wrongfully taking another's property as one's own. The term appropriation is often used not only with respect to real property but also with water. According to U.S. case law, a person completes an appropriation of water by diversion of the water and an application of the water to beneficial use.167 This common use of the term "appropriation" with respect to water illustrates two key points: (1) the term applies to natural resources-e.g., water or minerals-not just real property, and (2) mining space resources and putting them to beneficial use-e.g., selling or manufacturing the mined resources could reasonably be interpreted as an "appropriation" of outer space. While the ordinary meaning of "appropriation" reasonably includes the taking of natural resources as well as land, whether the drafters and parties to the OST envisioned such a broad meaning of the term remains difficult to determine with any certainty. The prohibition against appropriation "by any other means" supports such a reading, though, by expanding the prohibition to other types not explicitly described.168

As illustrated by this analysis, considerable ambiguity remains after this ordinary-meaning analysis and thus, the question of Treaty obligations and property rights remains unresolved. In order to resolve these ambiguities, an analysis of preparatory materials, historical context, and state practice follows.

2. Preparatory Materials

A review of meeting reports of the Committee on the Peaceful Uses of Outer Space and its Legal Sub-Committee regarding the Treaty reveals little to clear up the ambiguities of Articles I and II of the OST. In fact, the reports indicate that, despite several negotiating states expressing concern about the lack of clarity with respect to the meaning of "use" and the scope of the non-appropriation principle, no meaningful discussion occurred and no consensus was reached.16 9 Some commentators still conclude that the preparatory work does in fact confirm the drafters' intent for "use" to include exploitation. 170 These commentators do admit, however, that discussions of the term "exploitation" supporting their conclusion focused on remote sensing and communications satellites rather than on resource extraction.17 1 Further skepticism about such an intent for "use" to include "exploitation" also arises given the uncertainty amongst negotiating states about the meaning of these terms. A mere few months before the Treaty opened for signature in January 1967, negotiators were still asking questions about the meaning of "use" during the last few Legal Sub-Committee meetings. For example, in July 1966, the representative of France inquired: "Did the latter term ["use"] imply use for exploration purposes, such as the launching of satellites, or did it mean use in the sense of exploitation, which would involve far more complex issues?" 172 The representative noted that while some activities such as extraction of minerals were difficult to imagine presently, "[i]t was important for all States, and not only those engaged in space exploration, to know exactly what was meant by the term 'use.'173 In the same meeting, the representative from the USSR offered an interesting response to the question posed by the representative of France:

[A]dequate clarification was to be found in article II of the USSR draft, which specified that outer space and celestial bodies should not be subject to national appropriation by means of use or occupation, or by any other means. In other words no human activity on the moon or any other celestial body could be taken as justification for national appropriation. 174

This response implies that Article II acts as a qualification on Article I's broad provision for free exploration and use of outer space by all. Activity such as resource extraction would be viewed as national appropriation and such activity cannot be justified given Article II's prohibition, not even by falling within the ordinary meaning of "use." Despite this clarification, uncertainty appears to have remained, as lingering concerns were communicated in subsequent meetings by several other states, including Australia, Austria, and France."' Nevertheless, the committee put the Treaty in front of the General Assembly two months later without final resolution of the ambiguities regarding property rights arising from Articles I and II176 The preparatory materials ultimately fail to fully clarify the ambiguities of the meanings of "use" and "appropriation." The statement of the representative of the Soviet Union, one of the two main drafting parties, does, however, help push back on the interpretation of some academics that the nonappropriation principle fails to overcome the presumption of freedom of use.7

3. Historical Context

Two interrelated, major historical events cannot be ignored when considering the meaning of the OST: (1) the Cold War and (2) the Space Race. The success of Sputnik I in 1957 showed space travel and exploration no longer to be a dream, but a reality.7 While exciting, this news also brought fear in light of the world's fragile balance of power and tensions between the United States and the Soviet Union. 17 9 What if the Soviet Union managed to launch a nuclear weapon into space? What if the United States greedily claimed the Moon as the fifty-first state? To many, the combination of the Cold War and Space Race made the late 1950s and the 1960s a perilous time.so When viewed as a response to this perilous era, the OST begins to look much more like a nuclear arms treaty and an attempt to ease Cold War tensions than a treaty concerned with the issue of property rights in space."' The Treaty's emphasis on "peaceful purposes" supports this contextual interpretation. 1 82

On the one hand, as many suggest, this context leads to the conclusion that the vague nonappropriation principle of Article II does not prevent private property rights in space resources and the presumption of broad "use" prevails.1 83 Private property rights were simply not a concern of the Treaty drafters and therefore, the Treaty does not address-nor prohibit-such claims. On the other hand, the context surrounding the treaty's drafting does not necessarily lead to this conclusion. In fact, the emphasis on "peaceful purposes" and reducing international tension might instead suggest a stricter reading of Articles I and II. If things were so unstable and tense on Earth, the drafters may have instead intended Article II as a qualification on the general right to explore and use outer space in Article I, recognizing the simple fact that disputes over property, both land and minerals, have sparked some of history's bloodiest conflicts.

The Antarctic treaty experience evidences Cold War concern over potential resource rights disputes. Leading up to the finalization of the Antarctic Treaty of 1959,184 seven nations had already made official territorial claims over varying portions of the frozen landscape in hopes of laying claim to the plethora of resources thought to be located within the subsurface."' Although the Treaty itself did not directly address rights to mineral resources in the Antarctic,186 the treaty is interpreted to have frozen these claims in the interest of "[f]reedom of scientific investigation in Antarctica and cooperation toward that end.""' In a manner notably similar to the terms of Articles XI and XII of the OST, the Treaty promotes scientific exploration by encouraging information sharing of scientific program plans, personnel, and observations' and inspection of stations on a reciprocal basis.189 This Treaty along with several later treaties and protocols constitute the "Antarctic Treaty System," which as a whole manages the governance of Antarctica.1 9 0 In 1991, the Protocol on Environmental Protection to the Antarctic Treaty 91 ("Madrid Protocol") settled the question of property rights for the fifty years following the Protocol's entry into force. 192 The Madrid Protocol provides for "the comprehensive protection of the Antarctic environment ... [and] designate[s] Antarctica as a natural reserve, devoted to peace and science."193 Article 7 explicitly-and simplystates "[a]ny activity relating to mineral resources, other than scientific research, shall be prohibited."1 94 Though Article 25 allows for the creation of a binding legal regime to determine whether and under what conditions mineral resource activity be allowed, no such international legal regime has been created to date. 195 The ban on mineral resource exploitation may only be amended by unanimous consent of the parties. 19 6 The United States signed and ratified both the Antarctic Treaty of 1959 and the Madrid Protocol. 197

The freezing of territorial claims in the Antarctic 98 by the Antarctica Treaty of 1959199 illustrates the existence of true concern over potential resource dispute and conflict during the Cold War, in addition to the major concerns posed by nuclear weapons.2 00 The drafting states also recognized the potential for conflict over property in outer space and drew on the language of the Antarctic Treaty of 1959 to draft the OST.2 01 Given these driving concerns, Article II could be reasonably read as qualifying Article I's general rule. Under this reading, Article II serves the same qualifying purpose as Article IV regarding military and nuclear weapon use in space. Some might push back on this interpretation by claiming that the drafters could have used language such as that in the Madrid Protocol to explicitly prohibit mining in space. However, this argument is flawed. The Madrid Protocol was not written until well after both the original Antarctic Treaty of 1959 and the OST. Furthermore, the timing of the Madrid Protocol perhaps provides further evidence that resources in space are not to be harvested until a subsequent agreement regarding rights over them can be agreed upon internationally. While the historical context does leave some ambiguity as to whether the OST permits property rights over space resources, the Antarctic experience provides a compelling analogy and suggests that the OST does not allow for property rights in space resources.

4. State Practice

In its Frequently Asked Questions released about the SREU Act, the House Committee on Science, Space, and Technology forcefully asserted that the Act does not violate international law.20 2 in fact, according to the committee, the Act's provision of property rights "is affirmed by State practice and by the U.S. State Department in [c]ongressional testimony and written correspondence."2 03 Proponents of this view base their beliefs on several examples. One, "no serious objection" arose to the United States and the Soviet Union bringing samples of rocks and other materials from the Moon back by manned and robotic missions in the late 1960s, nor to Japan successfully collecting a small asteroid sample in 2010.204 Two, a practice of respecting ownership over such retrieved samples and a terrestrial market for such items exists, as illustrated by the fact that no one doubts that the American Museum of Natural History "owns" three asteroids found in Greenland by arctic explorer Robert E. Peary that are now part of the museum's Arthur Ross Hall of Meteorites. 205 Three, Congressmen also cite to a federal district court case, United States v. One Lucite Ball Containing Lunar Material,2 06 to illustrate state practice in favor of ownership over spaces resources. The case involved an Apollo lunar sample gifted to Honduras by the United States. The sample was stolen and sold to an individual in the United States.2 07 When caught during a sting operation intended to uncover illegal sales of imposter samples, the buyer was forced to forfeit the lunar sample after the court concluded the moon rocks had in fact been stolen, basing its decision in part on its recognition of Honduras having national property ownership over the sample. 208

These examples appear overwhelming, but they are not actually examples of activities of the same "form and content" that the SREU Act approves. 2 09 These examples all involve collection of samples in limited amounts and for scientific purposes, while the SREU Act approves large-scale collection and for commercial exploitation. The OST explicitly emphasizes a "freedom of scientific investigation in outer space," and the collection of scientific samples reasonably fall under this enumerated right. 2 10 Alternatively, the OST says nothing with respect to commercial exploitation, only discussing "benefits" of space in terms of sharing those benefits with all mankind.211 Furthermore, the American Museum of Natural History and Lucite Ball examples relied upon are misleading because they suggest that types of celestial artifacts found or gifted on Earth are subject to the same legal regime as resources mined or collected in space, which may not necessarily be true. The analogy of ownership over fish extracted from the high seas is also often cited in response to this pushback. Much like outer space, the high seas are open to all participants, yet the law of the seas still recognizes the right to title over fish extracted on the high seas by fishermen, who can then sell the fish.212 But again, this analogy has limited import because both the 1958 Geneva Convention on the High Seas and the United Nations Convention on the Law of the Sea ("UNCLOS") explicitly recognize the right to fish, while the OST grants no such right to exploit space resources. 2 1 3

Furthermore, state practice relevant to the question of property rights under the OST goes beyond these examples and analogies of ownership of resources taken from commons. State practice regarding property rights in general must be considered. For example, Professor Fabio Tronchetti disagrees with the oft-cited notion that state practice affirms the SREU Act.2 14 According to the professor, "under international law, property rights require a superior authority, a State, entitled to attribute and enforce them." 2 15 By granting property rights in the SREU Act, the United States impliedly claims that it has the authority to confer property rights over space resources-an authority traditionally reserved for the owner of a resource. This notion clashes with the nonappropriation principles of the OST. Though there is no consensus regarding whether the nonappropriation principle prohibits claims of sovereignty over resources, a strong consensus at least exists that the principle prohibits states from claiming sovereignty over real property in space.216 In some traditional systems of mineral ownership, however, ownership over resources ran with ownership over land.217 For example, under Roman law, property rights over subsurface minerals belonged to the landowner. 2 18 Thus, if the United States cannot have title in space lands under the nonappropriation principle, it cannot have title to the space resources in those lands either. Without title to the resources, the United States cannot bestow such title to its citizens under traditional international property law; by claiming that it can bestow such title, the United States is abrogating Article II of the OST. One could also argue that the in situ resources the Act grants rights in are actually still part of the celestial bodies; thus, the resources are real property prior to their removal, and are off limits under the Treaty.2 19 Given the limited import of the cited examples of state practice (limited quantity and scientific versus large-scale and commercial), the traditional practice of property rights being conferred from a sovereign to a citizen become incredibly compelling and suggest the SREU Act may abrogate the United States' treaty obligations.

A final piece of evidence, however, again inserts ambiguity into the interpretation: the sweeping rejection of the Moon Agreement and its limitations on property rights by the international community discussed supra Part JJJ.A.2. On the one hand, the rejection may imply that the international community approved of property rights. On the other hand, however, there were other reasons for the sweeping rejection. For example, Professors Francis Lyall and Paul B. Larsen claim the "main area of controversy"2 2 0 actually surrounded the Agreement's proclamation of the Moon and celestial bodies and their natural resources as the "common heritage of mankind" in Article 11.1,221 rather than the Agreement's general property-right provisions. Many believed the invocation of the "common heritage of mankind" language would impart actual obligations upon parties to share extracted resources, whereas the "province of all mankind" and "for the benefit and interest of all" language of the OST did not.222 As with ordinary meaning, preparatory materials, and historical context, state practice leaves some ambiguities and state interpretations should also be considered.

5. State Interpretations

Much like the preparatory materials discussed supra Part IV.A.1, subsequent state interpretation of the OST fails to fully address the question of the legality of property rights in space resources. On the one hand, the Senate Committee on Foreign Relations found that the drafters intended Articles I, II, and III of the Treaty to be general in nature when reviewing the Treaty,223 which perhaps suggests Article II's nonappropriation principle does not qualify Article I's general right to use or act as an exception. Yet, the committee also found the Treaty to be in response to the "potential for international competition and conflict in outer space." 2 24 To the committee, Articles I, II, and III stressed the importance of free scientific investigation, guaranteed free access to all areas of celestial bodies, and prohibited claims of sovereignty.225 Not only would property rights in natural resources potentially ignite and exacerbate conflict in space, but they also seemed somewhat incompatible with scientific investigation, free access, and the prohibition on sovereignty. During its hearing on the Treaty, the Senate Committee on Foreign Relations focused a majority of its discussion of Article I on whether or not the language "province of all mankind" imparted strict obligations, while devoting little to no time to the issue of the meaning of "use." 22 6 Former Justice Arthur Goldberg, then U.S. ambassador to the United Nations, did note the goal of the article was to "cnot subject space to exclusive appropriation by any particular power." 227 Nevertheless, this statement fails to resolve whether natural resources may be exploited, as such exploitation could be carried out in an inclusive manner.

The committee's review of Article II consumes only eight lines of the hearing transcript, merely adding that the Article is complementary to Article I and that space cannot be claimed for the country (likely referring to land rather than resources).2 28 A different exchange between Ambassador Goldberg, Senator Lausche, and the Chairman leaves further ambiguity regarding the use of natural resources in space: Mr. Goldberg: We wanted to establish our right to explore and use outer space. Senator Lausche: Yes. That is, any one of the signatory nations shall have the right to the use of whatever might be found in one of the space bodies. Mr. Goldberg: No, no. It doesn't mean that. It means that they shall be free on their own to explore outer space. The Chairman: Or to use it. Mr. Goldberg: To use it. The Chairman: But not on an exclusive basis. Mr. Goldberg: Everyone is free.229

At first, Ambassador Goldberg appears to have refuted the notion that a signatory could simply "use" anything found in one of the space bodies, such as a mineral, implying Senator Lausche's example exceeded the scope of Article I. He then went on to emphasize exploratory activities. But then, Ambassador Goldberg backtracked and reasserted the right to use without clarifying his initial qualification.

This sense of ambiguity remains today despite Congress signing off on the SREU Act. While sponsors of the bill and statements from resource extraction companies emphasized the broad scope of the right to "use" outer space and state practice in support of the legality of 230 property rights, several expert witnesses expressed genuine concern that obligations under the Treaty remain unclear and require additional analysis.231

B. Compatibility

Employing the treaty interpretation tools of ordinary meaning, preparatory materials, historical context, state practice, and state interpretation offers many possible understandings of the obligations imparted by Articles I and II of the OST. For example, while the ordinary meaning of "use" could reasonably include the exploitation of materials, the meeting summaries of the Fifth Session of the U.N. Committee on the Peaceful Uses of Outer Space Legal Sub-Committee make clear that no consensus was ever reached regarding whether "use" includes large-scale exploitation of space resources, let alone fee-simple ownership and the ability to sell commercially. State practice dealing with extraterrestrial samples also sheds little light on the confusion, as the examples cited all deal instead with scientific samples of limited quantity. The international community's rejection of the Moon Agreement also fails to bring clarity. While on the one hand the rejection could be read as a rejection of the idea that the OST prohibits private property rights, it could also be read as a rejection of the common heritage of mankind doctrine. Finally, the prospect of privateventure space mining and extraterrestrial resource extraction remained far off and futuristic at the time of the Treaty's negotiation, making drawing legal conclusions about the legality of these revolutionary activities extremely difficult.

Overall, however, the Treaty's structure and its purposes (preserving peace and avoiding international conflict in outer space) ultimately indicate that private property rights in space resources are prohibited by Article II's non-appropriation principle, at least until future international delegation determines otherwise (like in the Antarctic). The Treaty's structure confirms this interpretation. Article I lays down a general rule for activity in space. Subsequent articles of the Treaty then lay out more specific requirements of and qualifications to this general rule. Much like Article IV restricts the use of nuclear weapons in space, Article II restricts the use of space in ways that might result in potentially controversial property claims. Historically, claims to mineral rights have resulted in just as contentious conflict as those over sovereign lands. Treaty efforts to avoid conflicts in Antarctica and the high seas reflect similar sentiments. The Soviet Union's representative even hinted at this structural relationship between Articles I and II during Treaty S1 232 negotiations.22 In light of the imminent need to ease Cold War tensions, the potential for conflict over property, and the final structure of the Treaty, this Note concludes that the large-scale extraction of space resources is incompatible with the non-appropriation principle of Article II of the OST.23 3 As a result, the United States' provision of property rights to its citizens to possess, own, transport, use, and sell space and asteroid resources extracted through the SREU Act contravenes its international obligations established by the OST.