# 1AC

#### As notable engineer and physicist Graham Hawkes once said, “Space exploration promised us alien life, lucrative planetary mining, and fabulous lunar colonies. News flash … Space is nearly empty. It's a sterile vacuum, filled mostly with [what] we put up there.” In line with those words, I affirm the resolution: Resolved: The appropriation of outer space by private entities is unjust.

### Definitions

#### To begin, we will need to define some terms of importance within the resolution.

#### First, appropriation, according to the Collins Dictionary, is defined as

Collins Dictionary., No Date "Appropriation definition and meaning," No Publication, <https://www.collinsdictionary.com/us/dictionary/english/appropriation> ///AS

Appropriation of something that belongs to someone else is the act of taking it, usually without having the right to do so.

#### Second, Law Insider defines private entities as

Law Insider, No Date, "Private entities Definition," <https://www.lawinsider.com/dictionary/private-entities> ///AS

Private entities means individuals or organizations other than federal, state, or local personnel or agencies.

#### Finally, unjust is defined by Merriam Webster as

Injustice, No Date, “Definition of Unjust”, No Publication, <https://www.merriam-webster.com/dictionary/unjust> ///AS

1: characterized by injustice : UNFAIR

2archaic : DISHONEST, FAITHLESS

#### I would also like to make one observation about the resolution before we address its substance. The burden of the affirmative team is to prove we have a moral obligation to stop the appropriation of outer space by private entities, not that we have the capability or willingness to implement it as a nation or nation sates, simply that we have a moral obligation to.

### Value

#### Let’s move on to my value. My value for today’s debate is justice.

#### Justice is defined by Dictionary.com as

dictionary, No Date, "Definition of justice," <https://www.dictionary.com/browse/justice> ///AS

the quality of being just; righteousness, equitableness, or moral rightness: to uphold the justice of a cause.

#### My value of justice should be prioritized above all else for a few reasons. First, in order to create the most ethical world, we need an equitable and even playing field. According to the definition of justice, justice includes that. Second, justice recognizes uneven situations and takes them into account regarding private entities. By embracing justice, we recognize that, in determining the ethicality or justice of a system, we must consider multiple factors. Justice accounts for the material needs and most pressing concerns in our society sets the precedent as to what is the most moral course of action is to pursue.

### Value Criterion

#### Next let’s move on to my value criterion, the lens through which you evaluate my value. My value criterion for today’s debate is consequentialism.

#### Consequentialism is defined by The Stanford Encyclopedia of Philosophy as

Sinnott-Armstrong, Walter, 5-20-2003, "Consequentialism (Stanford Encyclopedia of Philosophy)," No Publication, <https://plato.stanford.edu/entries/consequentialism//> AS

**Consequentialism is an ethical theory that judges whether or not something is right by what its consequences are.**

#### The value criterion of consequentialism is the best method to achieve any given value. The best lens is one which brings about the greatest degree of material support to a given group and/or individual, and because consequentialism relies on looking at the end result of one’s actions and the impact they have, rather than the intended effect, it should come first.

### Contention 1

#### Let’s now move on to my contentions. My first contention is about the environment

Rocket launches are depleting the stratospheric ozone- according to Dallas in 2020,

[[J.A.Dallas](https://www.sciencedirect.com/science/article/abs/pii/S0959652620302560" \l "!), [S.Raval](https://www.sciencedirect.com/science/article/abs/pii/S0959652620302560#!), [J.P.Alvarez Gaitan](https://www.sciencedirect.com/science/article/abs/pii/S0959652620302560#!), [S.Saydam](https://www.sciencedirect.com/science/article/abs/pii/S0959652620302560#!), and [A.G.Dempster](https://www.sciencedirect.com/science/article/abs/pii/S0959652620302560#!) - [https://www.sciencedirect.com/science/article/abs/pii/S0959652620302560#](https://www.sciencedirect.com/science/article/abs/pii/S0959652620302560)!]

With the increasing accessibility of commercial space flight, **the environmental impacts** **of space launches** will **become increasingly significant** in the coming years. Here, for the first time, a review is presented of the environmental impacts of space launches, specifically of emissions from commonly used solid and liquid rocket propellants. While there are a number of environmental impacts resulting from **the launch of space vehicles**, the **deplet**ion of **stratospheric ozone** is the most studied **and** most **immediate**ly **concerning**. Solid rocket motors are the subject of most of the environmental studies on rocket launches, while the now more commonly used liquid rocket propellants are underrepresented in the literature. The limited studies of emissions from rocket **engines using liquid propellent** reveal that while they do **result in stratospheric ozone loss**, [and] **solid rocket motors** are responsible for **orders of magnitude greater loss**. The comparison of commonly used propellants highlights the **environmental trade-offs** that **must be made** when selecting a launch system. This review highlights the need for further study of the cumulative impacts that frequent space launches have on all areas of the environment, including global climate, ecosystem toxicity, and human toxicity, and with consideration given to all commonly used propellants, to ensure that the impacts are well characterised and well understood before the number of launches greatly increases.

#### If we continue to increase our presence in space, that will only worsen climate situations. We wouldn’t be creating justice if we were to increase environmental damage to the stratosphere. That means, by looking at the consequences of our actions using consequentialism, we should stop appropriation of outer space by private entities for the sake of our planet.

### Contention 2

#### Now, let’s move on to the second advantage which is about the possible dangers of increasing space exploration

#### Increasing amounts of collisions with debris create unsafe situations in space

Mike Wall, 08-17-2021, "Space collision: Chinese satellite got whacked by hunk of Russian rocket in March," Space, https://www.space.com/space-junk-collision-chinese-satellite-yunhai-1-02 ///AS

We may see more and more of these orbital smashups in the coming years. Yunhai 1-02's wounds are not self-inflicted. In March, the U.S. Space Force's 18th Space Control Squadron (18SPCS) reported the breakup of Yunhai 1-02, a Chinese military satellite that launched in September 2019. It was unclear at the time whether the spacecraft had suffered some sort of failure — an explosion in its propulsion system, perhaps — or if it had collided with something in orbit. We now know that the latter explanation is correct, thanks to some sleuthing by astrophysicist and satellite tracker Jonathan McDowell, who's based at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts. Related: The worst space debris events of all time On Saturday (Aug. 14), McDowell spotted an update in the Space-Track.org catalog, which the 18SPCS makes available to registered users. The update included "a note for object 48078, 1996-051Q: 'Collided with satellite.' This is a new kind of comment entry — haven't seen such a comment for any other satellites before," McDowell tweeted on Saturday. He dove into the tracking data to learn more. McDowell found that Object 48078 is a small piece of space junk — likely a piece of debris between 4 inches and 20 inches wide (10 to 50 centimeters) — from the Zenit-2 rocket that launched Russia's Tselina-2 spy satellite in September 1996. Eight pieces of debris originating from that rocket have been tracked over the years, he said, but Object 48078 has just a single set of orbital data, which was collected in March of this year. "I conclude that they probably only spotted it in the data after it collided with something, and that's why there's only one set of orbital data. So the collision probably happened shortly after the epoch of the orbit. What did it hit?" McDowell wrote in another Saturday tweet. Yunhai 1-02, which broke up on March 18, was "the obvious candidate," he added — and the data showed that it was indeed the victim. Yunhai 1-02 and Object 48078 passed within 0.6 miles (1 kilometer) of each other — within the margin of error of the tracking system — at 3:41 a.m. EDT (0741 GMT) on March 18, "exactly when 18SPCS reports Yunhai broke up," McDowell wrote in another tweet. Thirty-seven debris objects spawned by the smashup have been detected to date, and there are likely others that remain untracked, he added. Despite the damage, Yunhai 1-02 apparently survived the violent encounter, which occurred at an altitude of 485 miles (780 kilometers). Amateur radio trackers have continued to detect signals from the satellite, McDowell said, though it's unclear if Yunhai 1-02 can still do the job it was built to perform (whatever that may be). Space Junk Clean Up: 7 Wild Ways to Destroy Orbital Debris Click here for more Space.com videos... McDowell described the incident as the first major confirmed orbital collision since February 2009, when the defunct Russian military spacecraft Kosmos-2251 slammed into Iridium 33, an operational communications satellite. That smashup generated a whopping 1,800 pieces of trackable debris by the following October. However, we may be entering an era of increasingly frequent space collisions — especially smashups like the Yunhai incident, in which a relatively small piece of debris wounds but doesn't kill a satellite. Humanity keeps launching more and more spacecraft, after all, at an ever-increasing pace. "Collisions are proportional to the square of the number of things in orbit," McDowell told Space.com. "That is to say, if you have 10 times as many satellites, you're going to get 100 times as many collisions. So, as the traffic density goes up, collisions are going to go from being a minor constituent of the space junk problem to being the major constituent. That's just math." We may reach that point in just a few years, he added. The nightmare scenario that satellite operators and exploration advocates want to avoid is the Kessler syndrome — a cascading series of collisions that could clutter Earth orbit with so much debris that our use of, and travel through, the final frontier is significantly hampered. Our current space junk problem is not that severe, but the Yunhai event could be a warning sign of sorts. It's possible, McDowell said, that Object 48078 was knocked off the Zenit-2 rocket by a collision, so the March smashup may be part of a cascade. "That's all very worrying and is an additional reason why you want to remove these big objects from orbit," McDowell told Space.com. "They can generate this other debris that's smaller." Small debris is tough to track, and there's already a lot of it up there. About 900,000 objects between 0.4 inches and 4 inches wide (1 to 10 cm) are whizzing around our planet, the European Space Agency estimates. And Earth orbit hosts 128 million pieces of junk 0.04 inches to 0.4 inches (1 mm to 1 cm) in diameter, according to ESA. Orbiting objects move so fast — about 17,150 mph (27,600 kph) at the altitude of the International Space Station, for example — that even tiny shards of debris can do serious damage to a satellite. Mike Wall is the author of "Out There" (Grand Central Publishing, 2018; illustrated by Karl Tate), a book about the search for alien life. Follow him on Twitter @michaeldwall. Follow us on Twitter @Spacedotcom or Facebook. Join our Space Forums to keep talking space on the latest missions, night sky and more! And if you have a news tip, correction or comment, let us know at: community@space.com.

#### **Space mining causes increased conflict and tensions on Earth**

Ramin Skibba, 4-18-2016, "Mining in Space Could Lead to Conflicts on Earth," Nautilus | Science Connected, <https://nautil.us/mining-in-space-could-lead-to-conflicts-on-earth-4563/>

space mining is no longer science fiction. By the 2020s, Planetary Resources and Deep Space Industries—for-profit space-mining companies cooperating with NASA—will be sending out swarms of tiny satellites to assess the composition of hurtling hunks of cosmic debris, identify the most lucrative ones, and harvest them. They’ve already developed prototype spacecraft to do the job. Some people—like Massachusetts Institute of Technology planetary scientist Sara Seager, former NASA deputy administrator Lori Garver, and science writer Phil Plait—argue that, to continue advancing as a space-faring species, we need to embrace this commercial space mining industry, and perhaps even facilitate it, too. But should we? This question concerns me, as both an astrophysicist and a space enthusiast. Before becoming a science communicator, I worked for 15 years researching the evolution of galaxies, the properties of dark matter, and the expansion of the universe. From that perspective, the distance from us to the asteroid belt is actually rather small, so the question of whether to mine it, and in what way, hits close to home. The Space Act of 2015, a U.S. law passed last fall, authorizes the president “to facilitate the commercial exploration and utilization of space resources to meet national needs.” It’s an exciting prospect, to be sure, but also a troubling one. For one thing, it appears to violate international law, according to Congressional testimony by Joanne Gabrynowicz, a space law expert at the University of Mississippi. Before NASA’s moon landing, the United States—along with other United Nations Security Council members and many other countries—signed the 1967 Outer Space Treaty. “Outer space, including the moon and other celestial bodies,” it states, “is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.” The 1979 Moon Agreement went further, declaring outer space to be the “common heritage of mankind” and explicitly forbidding any state or organization from annexing (non-Earth) natural resources in the solar system. Major space-faring nations are not among the 16 countries party to the treaty, but they should arguably come to some equitable agreement, since international competition over natural resources in space may very well transform into conflict. Take platinum-group metals. Mining companies have found about 100,000 metric tons of the stuff in deposits worldwide, mostly in South Africa and Russia, amounting to $10 billion worth of production per year, according to the U.S. Geological Survey. These supplies should last several decades if demand for them doesn’t rise dramatically. (According to Bloomberg, supply for platinum-group metals is constrained while demand is increasing.) Palladium, for example, valued for its conductive properties and chemical stability, is used in hundreds of millions of electronic devices sold annually for electrodes and connector platings, but it’s relatively scarce on Earth. A single giant, platinum-rich asteroid could contain as much platinum-group metals as all reserves on Earth, the Google-backed Planetary Resources claims. That’s a massive bounty. As Planetary Resources and other U.S. and foreign companies scramble for control over these valuable space minerals, competing “land grabs” by armed satellites may come next. Platinum-group metals in space may serve the same role as oil has on Earth, threatening to extend geopolitical struggles into astropolitical ones. NASA’s increasing collaboration with space mining companies could distort and divert efforts previously focused on space exploration. Moreover, the technology that might enable this free-for-all—versatile “nanosatellites,” no larger than a loaf of bread—is relatively inexpensive. In December, while reporting for a story about these tiny satellites, also known as CubeSats, I came across some missions applicable to mining asteroids. In mid-2018, NASA will launch a satellite for a mission called Near-Earth Asteroid Scout, for example. It will deploy a solar sail, propel itself with sunlight, and journey to the asteroid belt, where it will scope out a particular asteroid and analyze its properties. Last June, NASA also awarded grants to Planetary Resources to advance the designs of spectral imagers and propulsion systems for CubeSats, and other missions will develop the satellites’ abilities to communicate and network with each other. NASA also awarded Deep Space Industries contracts to assess commercial approaches for NASA’s asteroid goals, which may involve hosting DSI’s asteroid-prospecting equipment on its missions. Like all forms of mining, it will be dangerous. If space-mining activities break up asteroids, the resulting debris could be hazardous for satellites, other spacecraft, and astronauts nearby. On the other hand, in a best-case scenario, space mining could be environmentally safe, capture only necessary minerals and water, and, in the more distant future even lead to the construction of a far-flung space station led by NASA and other space agencies, orbiting 200 million miles from Earth and serving as both a mining depot and a pit-stop for passing spacecraft. But it’s not clear that a pact between the commercial space mining industry and NASA would align with the public’s interest. NASA’s increasing collaboration with space mining companies could distort and divert efforts previously focused on space exploration and basic research, and discourage public interest and engagement in astronomy. Last October, for example, Seager advocated for space mining at a science writing conference I attended. She’s part of a motley group of advisors for Planetary Resources, including the movie director James Cameron, a lawyer for a prominent Washington D.C. firm, and Dante Lauretta, another astronomer whom I respect. Seager seems to believe that encouraging private space mining will lead to more investments and technological innovation that would enable more scientific research. In a 2012 interview with The Atlantic, for instance, she said, “The bottom line is that NASA is not working the best that it could for space science right now, and so in order for people like me to succeed with my own research goals, the commercial space industry needs to be able to succeed independently of government contracts.” But if the U.S. and U.S.-based companies lay claim to the richest and most easily accessible prospecting sites, not allowing other companies and nations to share in the wealth, economic and political relations could be damaged. That’s why this seems to be a dangerous path for space explorers. Once you’re on board with the commercial space industry, then you as a researcher must accept, if not support, everything that comes with it. Seager and a few other researchers may be willing to take this risk, but what about the rest of the space science community? Moreover, to succeed, these businesses will seek profitable missions, while science, exploration, and discovery—goals that stimulate public interest—will inevitably have lower priority. (Other commercial spaceflight companies, like Elon Musk’s SpaceX, do generate public interest, but they’re not directly involved in mining asteroids.) NASA may have its shortcomings, but at least its missions and research goals answer to the public. It’s not exactly a welcome thought to imagine more and more of our presence and activity in space being ceded, with NASA’s help, to private industry. What should happen instead? Commercial space mining and science would both be served well by decoupling from each other. We should treat outer space like we do Antarctica. That icy landscape is humankind’s common heritage, where we encourage scientific investigations and conservation and forbid territorial claims. If some organizations want to mine asteroids, then we should take the time to develop and establish an international framework to regulate it properly. Space-mining is an exciting opportunity to articulate our species’ role in our little galactic fragment. But it’s not just about sustainably managing limited or dwindling resources. It’s about our interactions with the nature beyond our humble world. We should explore the solar system as its steward without repeating our economically rapacious past. Ramin Skibba is a science writer and astrophysicist based in Santa Cruz and San Diego. He can be found at raminskibba.net and on Twitter at @raminskibba.

#### A just situation is one where people are not constantly in danger from space debris or the world is not constantly on the brink war because of unnecessary space colonization. That means that the appropriation of outer space by private entities is unjust. We know this because, the consequences of our actions yield negative results- like worsening climate change or increasing global tensions. Because of all these reasons, I urge you to vote affirmative for the justice of our world.

# 1NC

### Neg Case

#### I negate Resolved: The appropriation of outer space by private entities is unjust.

### Value/Criterion

#### The value is life – I’ll defend it as the biological state of being alive – prefer it

#### It’s intrinsic good – other values are subjective, being alive is objectively preferable

#### It’s a precondition to other values – we can’t have equality, justice, value to life, etc. if we are already dead

#### It’s quantifiable – we can measure whether someone is alive or not, but moral values are invisible and subjective

#### The value criterion is reverse utilitarianism – I’ll defend it as achieving the minimum amount of suffering – prefer it

#### It’s measurable – we can objectively compare body counts – that’s important for debates with a forced decision at the end, anything else necessitates judge intervention

#### It supercharges reversibility – I’ll isolate impacts of extinction, which is the ultimate irreversible impact. If we go extinct, that’s it forever

#### Combined, my value and value criterion means you’ll evaluate the round based on who can avoid the most death

### Contention 1

#### The 1967 Outer Space Treaty restricts lunar development for states, but doesn’t apply to corporations – private entities are the only route to space colonization

**Stockwell ’20** (Samuel Stockwell; Research assistant at RAND Europe working in defense, security and infrastructure. “Legal ‘Black Holes’ in Outer Space: the Regulation of Private Space Companies” <https://www.e-ir.info/2020/07/20/legal-black-holes-in-outer-space-the-regulation-of-private-space-companies/> 20 July 2020) // ELog

On 30th April 2020, NASA – the US government’s space agency – awarded three private space companies a jointcontract worth $967m to complete a lunar mission by 2024, in what was celebrated as “the last piece that [America] need[s] in order to get to the moon” by NASA administrator Jim Brindestine (The Telegraph, 2020). Yet, whilst this development was widely covered in the media, less coverage has focused on the extent to which existing international legislation surrounding outer space endeavours appropriately applies to private entities. Indeed, the prospect of a corporate foothold within the extra-terrestrial domain has thrown up both a mixture of optimism and concern regarding the potential benefits of expanding capital projects into space (Adolph, 2006; Dickens & Ormrod, 2007). By adopting the 1967 UN Outer Space Treaty (OST) as an analytical framework in relation to the rise of the so-called US ‘NewSpace’ actors, this essay argues that there are significant legal ambiguities regarding the status of private space companies in orbital space. Such loopholes allow the US government to circumvent its own obligations to the OST, whilst simultaneously undermining the notion of space as a ‘global commons’ through a commodification process. The lack of specificity within the OST surrounding private property rights over extra-terrestrial resources risks the prospect of reinforcing Earth-bound wealth inequalities and US dominance in space, by restricting the potential economic benefits for the broader global citizenry in favour of a narrow class of wealthy American investors. Moreover, the OST’s weak clause regarding the regulation of space surveillance risks the incentivisation of a ‘global panopticon’ network of US satellites. The rise of dual-use technology is blurring the boundaries between military and civilian observations, raising serious ethical concerns over the nature of US space-based data collection. Finally, the increasing number of private satellite constellations is facilitating the possibility of cataclysmic space debris collisions which could exacerbate geopolitical tensions. Such developments are also contributing towards the contamination of the broader space environment in ways that the OST had never envisioned. The UN Outer Space Treaty and Rise of the ‘NewSpace’ Actors Although ratified into international law in 1967, the UN Outer Space Treaty (OST) is perhaps still the most relevant piece of legislation for analysing state and non-state entity activity in outer space. Designed to prevent both the militarisation of space and national appropriation of celestial bodies at the height of Cold War tensions, the UN OST holds significant influence as a form of customary international law (Hebert, 2014: 6). Ratified by over 100 nations – including major spacefaring nations such as the United States, Russia and China – the treaty is widely accepted as an authoritative document and has formed the basis for all other space treaties that have succeeded it (Kramer, 2017: 129). This is in contrast to more recent legislation such as the 1972 Moon Treaty designed to promote cooperation in Moon exploration and development, which the US and other major space superpowers have refrained from signing (Adolph, 2006: 968-969). The type of American actors becoming involved in the realm of outer space has undergone significant diversification. Despite working alongside NASA since the 1950s, commercial enterprises were largely confined to the manufacturing of parts utilised in rockets and other equipment for space activities (Lal, 2016: 63-66). However, the continuous sharp decline in NASA’s overall budget that has occurred since the Apollo 11 moon landing, and the increasing trends towards the privatisation of government functions has drastically altered both the capabilities and the outlooks of private space companies. Indeed, although the space economy is growing overall, global government spending decreased by 1.3% between 2012 and 2013 while commercial-sector growth increased by roughly 7% (Conklin, 2017: 33). Central to the impetus behind this private sector space boom has been the emergence of the socalled ‘NewSpace’ actors – “a broad range of primarily US-based entrepreneurs… who, for more than 30 years, have aimed to commercialise space” (Valentine, 2012: 1046). Driven by a libertarian outlook of economics, and critical of NASA’s historical grip on space exploration, these individuals portray themselves as the pioneers of the ‘final frontier’ who will save humanity from extinction through privately-funded extra-terrestrial missions (Kearnes & van Dooren, 2017: 182). Near-Earth Object and Lunar Resource Mining: US Private Property in Space Lunar rock samples from the Apollo missions containing rare Earth resources, such as Helium-3 which produces more power and less waste than traditional nuclear reactors on Earth, have since fuelled incentives for extraterrestrial resource mining (Brearley, 2006: 44-46). This was further facilitated by suggestions that near-earth objects (NEOs) like the so-called ‘Anteros asteroid’ could comprise of over five trillion dollars’ worth of magnesium silicate and aluminium (Kramer, 2017: 131). Envisaging appropriation concerns that might arise from the future extraction of space assets by spacefaring nations, Article II of the UN OST declared that: “Outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means” (UN, 1967). The emphasis on claims of national sovereignty were intimately tied to the Cold War context at the time, where space activities were under the exclusive monopoly of governmental agencies and initiated for goals of military dominance or national prestige (Sachdeva, 2017: 210). However, the privatisation of the space industry that has occurred since the 1980s has meant that the legislation leaves an enormous amount of legal ambiguity and interpretation regarding the regulation of private resource mining in space. As Shaer (2016) demonstrates, the Article II provision fails to address either the exploitation of space for financial gain or the property claims of commercial enterprises (Shaer, 2016: 47). Nevertheless, Article VI of the UN OST asserts that: “States shall be responsible for national space activities whether carried out by governmental or non-governmental entities” (UN, 1967; own emphasis). Some scholars have suggested that this clause significantly restrains the activities of private space corporations by incentivising states to regulate their domestic organisations for fear of liability concerns (Abeyratne, 1998: 168). However, the US government recently enacted a piece of legislation which exploited this clause, in order to circumvent its own restrictions and strengthen US economic influence in space. The passage of the 2015 SPACE Act enabled US citizens to privately “possess, own, transport, use, and sell the resources” they obtain in outer space, whilst making careful consideration to deny national sovereign claims over such materials (Leon, 2018: 500). Yet, regardless of whether it is an American private company or public venture, the US is still satisfying its geopolitical interests; by exclusively siphoning off extra-terrestrial resources for American gain, the nation’s soft power is thereby extended at the expense of spacefaring adversaries such as China (Basu & Kurlekar, 2016: 65). Indeed NewSpace actors cleverly played on these strategic concerns prior to the bill’s passage, with billionaire space entrepreneur Robert Bigelow asserting that the biggest danger wasn’t private enterprises on the Moon, but that “America is asleep and does nothing, while China comes along… surveying and laying claim [to the Moon]” (Klinger, 2017: 222). The US government’s support for private space companies is also likely to lead to the reinforcement of Earth-bound wealth inequalities in space. Many NewSpace actors frame their long-term ambitions in space with strong anthropogenic undertones, by offering the salvation of the human race from impending extinction through off-world colonial developments (Kearnes & Dooren: 2017: 182). Yet, this type of discourse disguises the highly exclusive nature of these missions. Whilst they seem to suggest that there is a stake for ordinary citizens in the vast space frontier, the reality is that these self-described space pioneers are a member of a narrow ‘cosmic elite’ – “founders of Amazon.com, Microsoft, Pay Pal… and a smattering of games designers and hotel magnates” (Parker, 2009: 91). Indeed, private space enterprises have themselves suggested that they have no obligation to share mineral resources extracted in space with the global community (Klinger, 2017: 208). This is reflected in the speeches of individuals such as Nathan Ingraham, a senior editor at the tech site EngadAsteroid mining, who claimed that asteroid mining was “how [America is] going to move into space and develop the next Vegas Strip” (Shaer, 2016: 50). Such comments highlight a form of what Beery (2016) defines as ‘scalar politics’. In similar ways to the ‘scaling’ of unequal international relations that has constituted our relationship with outer space under the guise of the ‘global commons’ (Beery, 2016: 99), private companies – through their anthropogenic discourse – are scaling existing Earthbound wealth inequalities and social relations into space by siphoning off extra-terrestrial resources. By constructing their endeavours in ways that appeal to the common good, NewSpace actors are therefore concealing the reality of how commercial resource extraction serves the exclusive interests of their private shareholders at the expense of the vast majority of the global population.

## Contention 2

#### The aff forces public space initiatives that trades off other projects like earth science

Jones 19—(Research Analyst, Strategy & Insights at Brandwatch and Writer for Court House News). Alexandra Jones. 19, 5-30-2019. "Watchdog Finds NASA Projects Costly and Behind Schedule". <https://www.courthousenews.com/watchdog-finds-nasa-projects-costly-and-behind-schedule/>

A government watchdog group reported Thursday that NASA’s major space projects are over budget and falling behind schedule. The report from the U.S. Government Accountability Office found that, NASA’s top undertakings are exceeding their baseline costs by more than 27% and launches are being delayed on average by 13 months, the longest scheduling setback seen in the decade the watchdog has been assessing the projects. “NASA hasn’t been able to meet its cost and schedule goals on some of its costliest programs, like the James Webb Space Telescope and human spaceflight efforts,” according to a summary of the report. “Now these programs are staying in the portfolio longer than planned as NASA is starting new efforts, such as going back to the Moon.” This will place a strain on NASA’s budget going forward, the GAO said. “NASA will have to either increase its annual funding request or make tradeoffs between projects,” the report summary states. A predecessor to the Hubble Space Telescope, the James Webb Space Telescope project is costing NASA an estimated $9.6 billion, according to the GAO. First predicted to launch in 2007, its initial estimates were as low as $1 billion. The amount of required funds for NASA’s Space Launch System have also increased and senior NASA officials told the GAO that “it is unlikely these programs will meet the launch date of June 2020” – a date that has already been pushed back by 19 months. But the trend is nothing new for NASA. In its annual report released last year, the GAO found that nine out of 17 NASA projects were requiring more money and time than initially anticipated.

#### NASA earth science key to prevent climate change---extinction

Lori Garver 19, chief executive at Earthrise Alliance and was deputy NASA administrator from 2009 to 2013, “Forget new crewed missions in space. NASA should focus on saving Earth.”, https://www.washingtonpost.com/opinions/forget-new-manned-missions-in-space-nasa-should-focus-on-saving-earth/2019/07/18/79e55eb8-a995-11e9-9214-246e594de5d5\_story.html

NASA was not created to do something again. It was created to push the limits of human understanding — to help the nation solve big, impossible problems that require advances in science and technology. Fifty years ago, the impossible problem was putting a human on the moon to win the space race, and all of humanity has benefited from the accomplishment. The impossible problem today is not the moon. And it’s not Mars. It’s our home planet, and NASA can once again be of service for the betterment of all. Let’s remember our history. We went to the moon 50 years ago in response to the Soviet Union’s perceived domination of spaceflight. The 12 Americans who walked on the moon brought back 842 pounds of lunar material (rocks and dust), learned about our closest planetary body’s geology and gave us a view of the Earth that changed our perspective. But that’s not what drove NASA spending to 4 percent of the federal budget in 1965. We were willing to stake so much on the moon landing — only because there was so much at stake. After accomplishing this amazing feat, the aerospace community has again and again sought presidential proclamations to go further. President Trump is the fifth president to proclaim we will send humans to the moon and/or Mars within a specific time frame, a decree without a value proposition that has never inspired broad public support nor come close to coming true. NASA remains one the most revered and valuable brands in the world, and the agency is at its best when given a purpose. But the public doesn’t understand the purpose of spending massive amounts of money to send a few astronauts to the moon or Mars. Are we in another race, and if so, is this the most valuable display of our scientific and technological leadership? If science is the rationale, we can send robots for pennies on the dollar. In a July Pew Research Center study, 63 percent of respondents said monitoring key parts of Earth’s climate system should be the highest priority for the United States’ space agency — sending astronauts to the moon was their lowest priority, at 13 percent ; 18 percent favor Mars. The public is right about this. Climate change — not Russia, much less China — is today’s existential threat. Data from NASA satellites show that future generations here on Earth will suffer from food and water shortages, increased disease and conflict over diminished resources. In 2018, the National Academy of Sciences released its decadal survey for Earth science and declared that NASA should prioritize the study of the global hydrological cycle; distribution and movement of mass between oceans, ice sheets, ground water and atmosphere; and changes in surface biology and geology. Immediately developing these sensors and satellites while extending existing missions would increase the cadence of new, more precise measurements and contribute to critical, higher-fidelity climate models. NASA could also move beyond measurement and into action — focusing on solutions for communities at the front lines of drought, flooding and heat extremes. It could develop and disseminate standardized applications that provide actionable information to populations that are the most vulnerable. NASA could create a Climate Corps — modeled after the Peace Corps — in which scientists and engineers spend two years in local communities understanding the unique challenges they face, training local populations and connecting them with the data and science needed to support smart, local decision-making.

## Contention 3

#### Innovation high now but aff trades off

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Every once in a while, a confluence of discoveries, events and initiatives results in a breakthrough so significant that it propels the entire world to a higher level, redefining what is possible in so many different fields. This breakthrough is taking centerstage now, as the new era of space exploration — catalyzed by increasing launch access — dawns upon us. The surge of innovation that comes with this will create new opportunities and inspire the next generation of doers. When this happens, boundaries between scientific and social impact are blurred. Innovation leading to scientific discovery can benefit society in the same way that social innovation can diversify and support scientific innovators, who can contribute to global progress. To ride this wave of progress, we must all participate and innovate in the new era of space exploration. The intersection of space exploration, innovation and impact isn’t a new phenomenon. In the past, technology developments and spin-offs from space research have consistently found their way into communities worldwide sometimes with lifesaving benefits. The International Space Station supports experiments that have led to discoveries and inventions in communication, water purification, and remote guidance for health procedures and robotic surgeries. Satellite-enabled Earth observation capabilities that monitor natural disasters, climate and crops often support early warnings for threats and mitigation strategies. Space exploration has always been relevant to everyone no matter the discipline or interest. Commercialization of space has been key in many ways to the current boost in “firsts” over the last few years. It has spurred innovation in launch vehicles and related technologies that led to firsts in vertical-takeoff-vertical landing rocket technology, reusability of rocket boosters and privately developed crewed missions to orbit. Concurrently, NASA has continued to captivate our imagination with the first flight of a helicopter in another world, a mission to return an asteroid sample to Earth and sending a probe to make the closest ever approach to the sun. While we celebrate the scientific progress, there is a vastly important question that we all need to focus on: How can we drive the surge in innovation offered by increased access to space, to benefit humankind? Access to low-Earth orbit, and eventually human exploration of space, is a portal to achieve many impactful outcomes. The numbers and completion rate of microgravity experiments conducted by scientists will be greatly increased as a range of offerings in suborbital flights provide more opportunities to advance critical research in health, agriculture, energy, and more. Lunar, planetary, and even asteroid exploration may lead to discoveries of new materials — busting the limitations now imposed on capabilities for energy, transportation, and infrastructure or creating new sensors and devices that enhance safety on Earth. Space tourism —one can hope — has the power to potentially create an awareness of our oneness that may lead to social change.

#### Commercial space innovation stops extinction

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We find ourselves still at the dawn of a new space century, mindful of the victories and setbacks of our past, eager to pass the torch to the next generation of space visionaries, scientists, engineers, and enthusiasts. We look to the future not just to see how much bigger, faster, or higher we can reach, but also how the United States, and specifically the U.S. space community, can again inspire the nations of the world to align with us, as it did in the 20th century. The SmallSat Alliance is an alliance of companies developing, producing, and operating in all segments of the ‘next generation’ space economy; championing renewed U.S. leadership in the burgeoning commercial space economy, and advocating for the transformation of government-led space capabilities. We are experienced space professionals who have chosen to join with others leveraging our decades of hard-won experience, to develop smarter ways to explore space in the 21st century. A wonderful outgrowth of the legacy space program is the commercial, entrepreneurial, and job-creating commercial space business that it bequeathed. These next-generation enterprises range from multi-million-dollar startups providing rideshare opportunities or components for small satellites to multi-billion-dollar space data-analytic platforms reinventing urban car service and agricultural production. The early returns of this economic revolution are already on our doorstep: space data capabilities are exponentially growing elements of the 21st century world economy. Beginning with the dreams and funding by successful tech entrepreneurs, enormous venture investments are already delivering wondrous benefits to the world. Commercial Space – Profit and Non-Profit There are really two major categories in the commercial sector, the profit driven and the non-profit. The classic for-profit companies include not only those designing, building, launching, and operating satellites but also the tech sector that is turning that raw space data into gold through machine-learning analytics. Since for-profit companies are no longer dependent upon the revenues generated by the Cold War space race culture of a bygone era, this new generation of space companies is able to more efficiently capitalize on Moore’s Law, the nonstop exponential growth in chip density, and the associated networking technology co-evolving with it. This new generation is building profitable businesses helping to clean up our oceans of garbage and debris with satellite surveillance, reconnoitering to assist in enforcing laws that protect our oceans from illegal, unregulated, unlicensed fishing, something that is rapidly depleting the world’s most valuable and essential lifeforms. It’s leading in the innovative use of low-cost satellite constellations to produce ubiquitous remote-sensing data, enabling small business owners to be more profitable and less wasteful. For example, precise timing signals from space are already optimizing transportation of people, goods, and services, with even further gains anticipated with the introduction of artificial intelligence to assist drivers, perhaps even someday replacing them entirely. The non-profit sector is the other side of commercial space, concerned more for the general welfare of society, but every bit as integral to this new space enterprise. Much like every century before it in human history, ours is not without its unique challenges, some of which have been a consequence of the last, and all of which the space data domain can be leveraged to help solve. Examples are endless, but one challenge that this new space community is uniquely well-adapted for is to further inform worldwide resource allocation for the 21st century and beyond. These two primary resources are sustainable water and the materials needed for adequate housing for an ever-increasing human population. As cities and urbanization continue to expand, governmental planning challenges such as transportation design optimization for goods and services are only the beginning. Additionally, through using inexpensive remote sensing technologies, some members are designing space data analytics to mitigate human suffering from plagues, contain outbreaks, and combating illegal poaching. Some are connecting with other non-profits to curtail human trafficking for the sex trade or forced labor for migrant debt repayment. Still others are helping non-governmental organizations in their work to expose the use of children as soldiers. Addressing these challenges has little to do with resuscitating dreams conceived by long deceased science-fiction writers and much more to do with turning “swords back into plowshares” to solve real threats to humanity. Other non-profit initiatives include pursuing an even more foundational understanding of who we are and how to be the best custodians of our environment. Much as exploring and monitoring the world’s oceans has advanced civilization through a better understanding of human life and the planet, so too does exploring and monitoring from space. Low Earth orbit (LEO) provides a unique vantage point to look back on the planet and understand what is happening, anticipate what might happen and prepare for the future. In addition to better understanding Earth, responsible and rapid exploitation of the low Earth orbit domain will enhance the understanding of the solar system and the rest of the universe. Small satellites already offer low-cost platforms to study and explore what lies beyond the Earth. Other members are pioneering the use of zero-carbon, hydrogen-based reusable propulsion systems to ensure we don’t worsen our atmosphere using kerosene-fueled rockets for the coming tsunami of satellite launches. Finally, a mission ensuring the general welfare and planet survival for the next thousand years is finally confronting the existential threat that asteroids and comets pose to humanity. These extra-terrestrial, deep-space threats are passing dangerously close to our planet, and today we have no solar map of them and no defense.

## A/T Aff Case

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