# AFF

### Util

#### Pleasure and pain are intrinsically valuable. People consistently regard pleasure and pain as good reasons for action, despite the fact that pleasure doesn’t seem to be instrumentally valuable for anything.

Moen 16 [(Ole Martin Moen, Research Fellow in Philosophy at University of Oslo) “An Argument for Hedonism,” Journal of Value Inquiry (Springer), 50 (2) 2016: 267–281, <https://link.springer.com/article/10.1007/s10790-015-9506-9>] TDI

Let us start by observing, empirically, that **a widely shared judgment about intrinsic value and disvalue is that pleasure is intrinsically valuable and pain is intrinsically disvaluable.** **On virtually any proposed list of intrinsic values and disvalues (we will look at some of them below), pleasure is included among the intrinsic values and pain among the intrinsic disvalues.** This inclusion makes intuitive sense, moreover, for **there is something undeniably good about the way pleasure feels and something undeniably bad about the way pain feels, and neither the goodness of pleasure nor the badness of pain seems to be exhausted by the further effects that these experiences might have.** “Pleasure” and “pain” are here understood inclusively, as encompassing anything hedonically positive and anything hedonically negative.2 **The special value statuses of pleasure and pain are manifested in how we treat these experiences in our everyday reasoning about values.** If you tell me that you are heading for the convenience store, **I might ask: “What for?” This is a reasonable question, for when you go to the convenience store you usually do so**, not merely for the sake of going to the convenience store, but **for the sake of achieving something further that you deem to be valuable.** You might answer, for example: “To buy soda.” This answer makes sense, for soda is a nice thing and you can get it at the convenience store. I might further inquire, however: “What is buying the soda good for?” This further question can also be a reasonable one, for it need not be obvious why you want the soda. You might answer: “Well, I want it for the pleasure of drinking it.” **If I then proceed by asking “But what is the pleasure of drinking the soda good for?” the discussion is likely to reach an awkward end. The reason is that the pleasure is not good for anything further; it is simply that for which going to the convenience store and buying the soda is good.**3 As Aristotle observes**: “We never ask [a man] what his end is in being pleased, because we assume that pleasure is choice worthy in itself.**”4 Presumably, a similar story can be told in the case of pains, for if someone says “This is painful!” we never respond by asking: “And why is that a problem?” We take for granted that if something is painful, we have a sufficient explanation of why it is bad. If we are onto something in our everyday reasoning about values, it seems that **pleasure and pain are both places where we reach the end of the line in matters of value.**

#### Moral uncertainty means preventing extinction should be our highest priority.

Bostrom 12 [(Nick Bostrom, Faculty of Philosophy & Oxford Martin School University of Oxford) “Existential Risk Prevention as Global Priority.” Global Policy, 2012] TDI

These reflections on moral uncertainty suggest an alternative, complementary way of looking at existential risk; they also suggest a new way of thinking about the ideal of sustainability. Let me elaborate.¶ Our present understanding of axiology might well be confused. We may not now know — at least not in concrete detail — what outcomes would count as a big win for humanity; we might not even yet be able to imagine the best ends of our journey. If we are indeed profoundly uncertain about our ultimate aims, then we should recognize that there is a great option value in preserving — and ideally improving — our ability to recognize value and to steer the future accordingly. Ensuring that there will be a future version of humanity with great powers and a propensity to use them wisely is plausibly the best way available to us to increase the probability that the future will contain a lot of value. To do this, we must prevent any existential catastrophe.

#### Consequences first — anything else is irresponsible and escapes valuable discussions.

**Bracey 06** (Christopher A. Bracey 6, Associate Professor of Law, Associate Professor of African & African American Studies, Washington University in St. Louis, September, Southern California Law Review, 79 S. Cal. L. Rev. 1231, p. 1318)

Second, reducing conversation on race matters to an ideological contest allows opponents to elide inquiry into whether the results of a particular preference policy are desirable. Policy positions masquerading as principled ideological stances create the impression that a racial policy is not simply a choice among available alternatives, but the embodiment of some higher moral principle. Thus, the "principle" becomes an end in itself, without reference to outcomes. Consider the prevailing view of colorblindness in constitutional discourse. Colorblindness has come to be understood as the embodiment of what is morally just, independent of its actual effect upon the lives of racial minorities. This explains Justice Thomas's belief in the "moral and constitutional equivalence" between Jim Crow laws and race preferences, and his tragic assertion that "Government cannot make us equal [but] can only recognize, respect, and protect us as equal before the law." [281](http://web.lexis-nexis.com/universe/document?_m=cd9713b340d60abd42c2b34c36d8ef95&_docnum=9&wchp=dGLbVzz-zSkVA&_md5=9645fa92f5740655bdc1c9ae7c82b328) For Thomas, there is no meaningful difference between laws designed to entrench racial subordination and those designed to alleviate conditions of oppression. Critics may point out that colorblindness in practice has the effect of entrenching existing racial disparities in health, wealth, and society. But in framing the debate in purely ideological terms, opponents are able to avoid the contentious issue of outcomes and make viability determinations based exclusively on whether racially progressive measures exude fidelity to the ideological principle of colorblindness. Meaningful policy debate is replaced by ideological exchange, which further exacerbates hostilities and deepens the cycle of resentment.

### 1AC – Innovation

#### Advantage 1 is Monopolies

#### The status quo of space commercialization is a permissionless system that threatens private sector innovation due to ambiguity and foreign hostility. Schaefer 17

Schaefer, Matthew. "The contours of permissionless innovation in the outer space domain." U. Pa. J. Int'l L. 39 (2017): 103. https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=1953&context=jil

PERMISSIONLESS INNOVATION FOR NEW ON-ORBIT ACTIVITIES: THE INTERNATIONAL OBLIGATION LIMIT, THE NATIONAL SECURITY LIMIT, AND THE INVESTOR CERTAINTY LIMIT Thus, for traditional space activities we observe a range of regulatory models: 1) an FAA launch and reentry and human space flight framework that certainly is closest to the permissionless in- novation ideal; 2) a NOAA remote sensing regime that is perhaps overbroad, impacting innovative small satellite ideas, and that struggles with establishing a permissionless innovation esprit de corps in the interagency process as participants have yet to fully reassess benefit-cost analysis of national security concerns in an environment where foreign remote sensing systems are increasingly sophisticated; and 3) an FCC spectrum licensing regime that by necessity, given the properties of spectrum and the demands of the satellite business case, must have significant ex ante government involvement. All those regulatory models are long-established and will take considerable effort to change. In contrast, regulating new on-orbit space activities begins with a relatively clean slate. There is no formal regulatory framework in place, although the government has leveraged its launch licensing authority, especially its payload review prong, to a degree to partially fill the gap. The only other exception to this clean slate is that for well over a decade NOAA and the FCC have imposed debris mitigation requirements on licensees—presumably relying on their “public interest” authority to do so—although some believe even this limited on-orbit regulation constitutes “competence creep.”103 Staunch permissionless innovation advocates might say this essentially clean slate is a victory and should be maintained. In essence, companies are free to conduct new on-orbit activities if they so choose, and the government need not authorize those activities, nor may the government prohibit those activities. In fact, permissionless innovation advocates might say this is almost an ideal scenario, in that the current state of affairs achieves (near) pure or unadulterated permissionless innovation. However, the irony is that the benefits of permissionless innovation will not be achieved in this (nearly) pure state. There are at least three major risks to allowing calls for a pure or unadulterated permissionless innovation regulatory model with respect to new on-orbit activities. First, it is very clear that U.S. international obligations require “authorization” of and the provision of “continuing” supervision, by the government of commercial activities in outer space. Thus, any pure version of permissionless innovation would run afoul of U.S. international obligations in the primary space treaty, the Outer Space Treaty. Second, with the national security implications of many space activities, it is unrealistic to expect adoption of a pure permissionless innovation regulatory model to govern such activities; the industry largely recognizes this dynamic. Third, a large number of businesses and investors in the space sector seek a minimal amount of regulation to ensure a transparent framework for approval of their on-orbit activities so that regulatory uncertainty and foreign hostility to their activities is minimized.104 For each of these reasons, a failure by Congress to create explicit “light touch” authorization and supervision authority in an Executive Branch agency will actually defeat the purposes of permissionless innovation. Of course, the Executive Branch will have incentives to continue to leverage its payload review authority to try to ensure that U.S. international obligations are met and that U.S. national security is not endangered, and to give companies and their investors a degree of regulatory approval and certainty they desire. Chairman Babin and former FAA officials have argued that because the OST’s Article VI is not a self-executing international obligation, and thus not automatically part of the U.S. legal system, the Administration cannot seek to authorize or supervise new on-orbit space activities unless Congress passes a law delegating authorization and supervision responsibility to the Executive Branch.105 This may well be true but the situation is slightly more complex. Congress has already delegated payload review authority to the FAA, and a factor to consider under a payload review is U.S. international obligations.106 One might argue ensuring no violation of international obligations (self-executing or not) is thus an objective the FAA can consider in a payload review. However, the counterpoint is that the Executive Branch lacks the power to consider international obligation compliance for on-orbit activities because Congress, when granting re-entry licensing authority in 1997, indicated it did not want to grant on-orbit authority at that time.107 This places the U.S. Executive Branch in a difficult position—the Hobbesian choice of complying with international obligations or acting consistently with apparent Congressional intent. Similarly, space businesses—the innovators—are also put in a poor position. They could simply seek to pursue any on-orbit activity they like, and then pursue litigation if the Executive Branch blocks an activity that, for example, the government believes would violate U.S. international obligations or endanger U.S. national security. The “pursue and litigate” strategy is not an attractive option for many space companies. Litigation consumes time and money, and global competitors may advance during that time. Additionally, the dynamics of the space business are such that the government is always a considerable part of the customer base, and suing one’s customer is not necessarily an attractive option. If the U.S. Executive Branch chooses the alternate path and stands down by not blocking the activity nor authorizing it, then space businesses, particularly those involved with international partners or an international customer base, would need to worry about potential foreign government actions for failure by the U.S. government to meet international obligations. For example, a foreign government might block cooperation by a partner or prevent customers in its territory from purchasing goods or services connected with the activity. That is why on-orbit businesses have been “knocking on the door” of various agencies, including the State Department, the last several years, in essence asking who will give them a stamp of approval. It is an uncertain process currently— one that U.S. space businesses desire to be made certain and transparent. We explore each of these three risks—international obligation risk, national security risk, and regulatory uncertainty risk—below, with particular emphasis on meeting U.S. international obligations. Particular emphasis is placed on meeting U.S. international obligations because it appears that a drive for a (nearly) pure form of permissionless innovation is leading to misguided treaty interpretations of the Outer Space Treaty that do not respect long-standing rules of treaty interpretation binding the United States and constitutes a development that can damage U.S. interests in other treaty regimes too. The analysis below reveals that the U.S. Congress can establish an authorization regime that meets U.S. international obligations, allows the U.S. government to protect national security, and provides regulatory certainty for U.S. space business investors, while at the same time achieving the benefits, and retaining the essence, of permissionless innovation thinking.

#### Private appropriation results in arbitrary valuation of businesses in the space industry and monopolization, which decks innovation and causes armed conflict. Sterns and Tennen 03

P.M. Sterns, L.I. Tennen, Privateering and profiteering on the moon and other celestial bodies: Debunking the myth of property rights in space, Advances in Space Research, Volume 31, Issue 11, 2003, Pages 2433-2440, ISSN 0273-1177, https://doi.org/10.1016/S0273-1177(03)00567-2. (https://www.sciencedirect.com/science/article/pii/S0273117703005672)

If claims of private appropriation are ineffective, in contravention of the corpus juris spatialis, and contrary to the long term interests of space commercialization, than it must be asked what is the benefit of making such claims? There are two economic aspects which would be positively impacted by private appropriation of celestial bodies: the first is the increase in the net worth of the privateering company, artificially inflated by the optimistic valuation of the claimed space assets; and second is the pursuit of profit by the trade in “subsidiary rights” such as leasehold interests, mining rights, easements, and other traditionally alienable property rights. Neither of these economic considerations is directly related to the use of celestial resources, nor to the providing of a product or service uniquely available in the celestial environment. If the intent of the entrepreneur is to capitalize on these economic considerations, that intent should be clearly stated at the outset. Any other course would be disingenuous and deceptive. The private ownership of unlimited rights to celestial property would add a significant element to the cost of conducting an entrepreneurial venture. That is, the ability of all states to explore and utilize areas on or below the surface of celestial bodies, as guaranteed by the corpus juris spatialis, no longer would be a right, but a commodity available only to the highest bidder. Monopolies and other anti-competitive practices would restrict rather than enhance space commercialization. These anti-competitive effects of private appropriation arc exemplified by the activities of the Lunar Embassy itself: The cost for a piece of the moon has gone up astronomically. Before 200 1, Hope sold 17,700-acre tracts for $16, the price he now charges for one acre (The Arizona Republic, section D, p. 2). Thus, even while operating in a vacuum, the price structure of the Lunar Embassy has not been stable, but has been arbitrarily manipulated. One can only imagine the proliferation of anti-competitive practices if private appropriation were officially permitted. CONCLUSION The assertion that private entities are not subject to the non-appropriation principle, as expressed in article II of the Outer Space Treaty, is a myth, and lacks a cogent analytical foundation. Not only would so called private appropriation be in violation of the corpus juris spatialis, but the arguments which have been presented in opposition to article II lack either a legal justification, a factual predicate, or both. Moreover, the abrogation or renunciation of the non-appropriation principle would be antithetical to the interests of space commercialization. Conflicting, competing and overlapping claims would create international tensions, and potentially lead to armed conflict, both on and off this planet. The extant law of outer space, both international and domestic, provide a basic framework for the development of regulation of space commerce. Domestic licensing regimes, together with international commitments regarding authorization and supervision of private entities in space, prevention of harmful interference, and participation in consultations concerning potentially harmful interference, grant a significant measure of protection for private ventures in space. Claims of fee simple ownership of space property are unnecessary and ineffective to protect private interests from interference. Those who advocate the renunciation and abandonment of the non-appropriation principle are either seeking to increase their own bottom line by disingenuous and deceptive constructs, or lack an appropriate appreciation and respect for international processes. Perhaps most significant in this regard is the tangible benefit the corpus juris spatialis has made in maintaining outer space exclusively for peaceful purposes.

#### Commercial rocket launches produce space clutter—increased debris could reach a tipping point. AND private companies are impossible to control – only space decolonization solves

Thompson 20 [(Clive, author of Coders: The Making of a New Tribe and the Remaking of the World, a columnist for Wired magazine, and a contributing writer to The New York Times Magazine) “Monetizing the Final Frontier The strange new push for space privatization,” December 3, 2020 <https://newrepublic.com/article/160303/monetizing-final-frontier>] TDI

“Physics tells us that two things can’t occupy the same space at the same time or else bad things happen,” Jah said dryly. Indeed, there’s already been one collision that produced sprawling orbital pollution. In 2009, a satellite owned by the U.S. firm Iridium slammed into a decommissioned Russian government satellite at more than 26,000 mph. The crash produced 2,300 pieces of debris, spraying off in all directions. And debris is a particularly gnarly problem in space, because when it’s traveling at thousands of miles an hour, even a marble-size chunk is like a bullet, capable of rendering a damaged satellite inoperable and unsteerable—the owner can no longer fire its boosters to guide it into a higher or lower orbit. There are currently an estimated 500,000 marble-size chunks up there. Decades of space travel by governments left plenty of refuse, ranging from parts of rocket boosters to stray bits of scientific experiments. One particularly grim vision of the future that haunts astronomers is the “Kessler syndrome,” proposed by the astrophysicist Donald Kessler in 1978. Kessler hypothesized that space clutter could reach a tipping point: One really bad collision could produce so much junk that it would trigger a chain reaction of collisions. This disaster scenario would leave hundreds of satellites eventually destroyed, and create a ring of debris that would make launching any new satellites impossible, forever. “Near space is finite—it’s a finite resource,” Jah said. “So now you have this growing trash problem that isn’t being remediated.... And if we exceed the capacity of the environment to carry all this traffic safely, then it becomes unusable.” That’s why a growing chorus of critics are already making the case that space is the next major environmental area to protect, after the oceans and land on Earth. “People seem to really treat resources in space as being infinite,” said Erika Nesvold, an astrophysicist who’s the cofounder of The JustSpace Alliance. “As we’ve seen, people don’t really intuitively understand exponential growth.” That’s the dilemma in a nutshell: The available room in the sky is limited, but the plans for growth are exponential. SpaceX isn’t the only New Space firm looking to toss up satellites. Satellite and rocket start-ups are now lining up en masse, atop new waves of investment. There are satellites geared up to connect to “the internet of things” so companies can communicate among proprietary networks of household devices. There are floating cameras pointing down—so as to gather “geospatial intelligence,” which is to say data streamed from “the vantage point you get from satellites looking down on Earth and giving us information about our planet,” as the venture capitalist Anderson told me. And new forms of satellite vision are emerging all the time, such as cameras that can see at night, or are specially designed to see agriculture. Experiments abound, and so satellite launches will inevitably multiply in their wake. Part of what makes near-Earth orbit so chaotic is that it is, at the moment, remarkably unregulated—not unlike the internet of the early ’90s. An American firm has to get permission from the Federal Communications Commission to launch a satellite, but once it’s in orbit, there’s no federal agency that can compel it to move out of the path of a collision. Satellite owners generally don’t like to move if they can avoid it, because their satellites have a limited amount of fuel; any movement decreases their usable lifespan. On top of that, there are dozens of nations shooting satellites into low-Earth orbit—but no international body coordinating their flight paths. Last fall, the European Space Agency realized one of SpaceX’s new Starlink satellites was on a dangerously close path to an ESA satellite. SpaceX said it had no plans to move the satellite; so the ESA decided to fire its thrusters and get clear. This high-stakes negotiation was conducted via email. What’s more, space debris is extremely hard to source. If a British satellite slams into yours, you can probably figure out who hit you. But if your satellite is wrecked by a random piece of junk, nobody has any clue where that debris came from. It is, in this way, a neat parallel to the problem of C02, where a ceaseless barrage of tiny commercial decisions creates a sprawling problem—one that’s all but designed to ensure that everyone who caused it can deny responsibility. And damage is asymmetric: A company with a small $60,000 satellite could smash into a wildly expensive one paid for by U.S. taxpayers. “A National Reconnaissance Office satellite is at least a billion dollars, if not more, so they have a lot more to lose if something hits a satellite,” Bhavya Lal, a researcher at the IDA Science and Technology Policy Institute, noted. “As more private activity starts to happen, there’s more chances of that loss of control, too.” One might dismiss all this anxiety as a sort of sci-fi version of hippie environmentalism—except that even the administrator of NASA is deeply worried about the chaos and destruction likely to be sown by commercial activity in near-Earth orbit. Jim Bridenstine, the Trump-appointed head of NASA, is as pro-market as one can be. He praises SpaceX every chance he gets; he talks about privatizing the space station. But when I asked him about the looming danger of space debris, during a press-conference call, he conceded that it’s a huge, unresolved issue.

“More satellites mean more risk,” he said. “And we as a nation have not yet caught up to the risk that currently exists in space.” In September, a few months after Bridenstine and I spoke, the space station had to fire its thrusters for 150 seconds to [move out of the way](https://blogs.nasa.gov/spacestation/2020/09/22/station-boosts-orbit-to-avoid-space-debris/) of dangerously approaching space junk, while the crew huddled in a Soyuz capsule in case the station’s hull was breached and they had to flee to Earth.

Apart from the fate of the station, one could ask who cares if a commercial stampede blights Earth’s orbit, and wrecks anyone’s ability to keep satellites aloft? Maybe it’ll just hurt a bunch of investors. And maybe we need less surveillance from deathless orbiting eyes, not more.

There are, though, plenty of civically significant reasons to keep low-Earth orbit usable. Satellite monitoring isn’t solely a spy activity—these days, it has become a powerful tool for climate scientists to figure out how the oceans are warming, and to puzzle out our adaptations to climate change. Other nonprofit concerns use satellites to monitor injustices on Earth: Global Forest Watch, for example, takes data from the 140-satellite array of the firm Planet and uses it to help [bust illegal deforestation](https://www.planet.com/pulse/planet-ksat-and-airbus-awarded-first-ever-global-contract-to-combat-deforestation/).

So it’d certainly be good to keep low-Earth orbit from becoming a junkyard. But there’s no ready consensus on how to do that. Some government regulation could help: Bridenstine wants Congress to pass a bill funding a department in charge of “compelling somebody to maneuver if it’s necessary.” Moriba Jah would like a federal law requiring space firms to openly publish the location of their satellites. (Some, like Planet, already do, but most, as Jah has found, make it very difficult for others to pin down the exact locations of their satellites.) “You can’t enforce anything unless you know what’s happening,” Jah said, and a name-and-shame system could help: “Once people can assign a first and last name, it’s like, OK, these assholes aren’t complying.” Better tech might also assist; the U.S. firm [LeoLabs](https://www.leolabs.space/" \t "_blank) is building a radar-dish array that can track pieces of space junk as small as a few centimeters. Others are working on as-yet-untested ways of actually cleaning up orbital junk, possibly by pushing it down to burn up on reentry.

“Sometimes I think that we might need to have some terrible collision event happening for the world to kind of come together and take it seriously.”

New Space firms themselves, however, want to be left alone to deal with this problem. Most I spoke to argued—quite against the weight of industrial history—that the free market would self-regulate, since each firm wants orbits clean enough to make money in. But even some ardent champions of the new commercial boom worry things may get worse before anyone snaps to attention. “Sometimes I think that we might need to have some terrible collision event happening for the world to kind of come together and take it seriously,” Lal told me.

Satellites are the big commercial opportunity in space right now, though there are plenty of others in various states of gestation. Each one raises a handful of intriguing possibilities for a commercial boom, and its own blizzard of questions for earthbound society. One rough rule of thumb for sizing them up might go something like this: The farther out you go from Earth, the weirder the questions become.

The most proximal market, according to investors, is probably the development of [manufacturing in near-Earth orbit](https://www.space.com/40552-space-based-manufacturing-just-getting-started.html), on space stations. Microgravity, it turns out, makes it possible to create materials that can’t easily be pulled together on Earth. The range of product lines for off-planet factories runs from specially shaped contact lenses (designed to correct deep vision problems) to optical fibers capable of carrying more data than cables made on Earth. One firm, [Nanoracks](https://nanoracks.com/" \t "_blank), currently contracts out room for commercial start-ups on the International Space Station. Its early client list boasts a diverse array of for-profit activities—everything from running science experiments to launching small, inexpensive “[Cubesats](https://www.nasa.gov/mission_pages/cubesats/overview" \t "_blank)” that can fit in your hand and mostly do remote sensing (like monitoring the atmosphere) for research or industry. In the long run, Nanoracks aims to launch its own space station to offer complex manufacturing capabilities that wouldn’t currently fit in the International Space Station’s limited confines.

“There’s a lot of work you can do, a lot of research and a lot of exciting things when you’re not connected to a gigantic, humongous modular space station that has different gravity tensions, different forces acting on it, disturbing the microgravity,” Nanoracks CEO Jeffrey Manber noted.

The next generation of space stations will probably be built—like Manber’s hoped-for one—mostly by private interests. Such installations will continue to do plenty of work for governments. Manber would rather make a fully robotic space station—it’s far more profitable for New Space moguls not to shoulder the, ahem, astronomical costs of keeping people alive in outer space—but he anticipates that a major early customer would likely be NASA, and one of NASA’s main scientific areas of study is how humans react to living in space. Any for-profit space station NASA’s contracting agents would bring on would thus likely need to host a crew.

Beyond the space station beckons another old NASA stomping ground—the moon, which has become newly lucrative. After the last Apollo visit in 1972, NASA and Congress abandoned the moon; reaching it had been a quest to beat the Soviets, and, that race won, public support for the incredible expense evaporated. But over the last decade, moon activity has rebooted. Trump [announced](https://www.theatlantic.com/science/archive/2019/03/trump-nasa-moon-2024/585880/) the goal of returning NASA astronauts to the lunar surface; India [tried and failed](https://www.npr.org/2019/11/26/782890646/2-months-after-failed-moon-landing-india-admits-its-craft-crashed) to put a lander down; and last year, [China succeeded](https://www.space.com/42981-china-moon-far-side-panorama-chang-e-4.html). NASA is currently planning to build a lunar [Gateway](https://www.nasa.gov/gateway), a space station orbiting the moon, to assist in regular traffic back and forth; SpaceX has a $7 billion contract for launching its components.

What, exactly, made the moon sexy again? The [discovery of water](http://news.bbc.co.uk/2/hi/science/nature/8544635.stm). Beginning in the late aughts, moon probes have found that craters in the lunar poles contain water ice—some 600 million tons of it, according to one estimate. This instantly changed the moon’s geopolitical and economic import, because water is an enormously precious commodity in space. It’s crucial for life—not just as a fluid, but broken into its constituent molecular parts: oxygen that lets you breathe, and hydrogen for fuel. One scientist’s rough estimate found that the amount of water on the moon could power one space shuttle launch every day for 2,200 years. Several companies announced their eventual goal would be to create landing craft that could reach the moon and mine the water. One such concern, [the Moon Express](https://www.theverge.com/2017/7/12/15958164/moon-express-robot-landers-private-mining-outpost), pitches its mission in a heady compound of colonialist new frontier rhetoric—equal parts Star Trek and Rudyard Kipling: “The Moon is Earth’s 8th continent,” the firm announces on its website.

But even assuming the wet new lunar frontier can be tamed—for all the space-booster rhetoric, it’s still a very spec-ulative prospect, both logistically and economically—there’s a whole host of untested questions about property rights in the great beyond. Space law, it turns out, is very ambiguous about who’s empowered to exploit space resources, and to what geopolitical-cum-commercial ends. There’s an [Outer Space Treaty](https://2009-2017.state.gov/t/isn/5181.htm), signed in 1967 by most major industrial countries, which seeks to establish space as a shared resource for humanity. It lets corporations engage in commercial activities on other celestial bodies—but neither they nor countries can claim property rights; and whatever a corporation does in space, its host country is on the hook for. There is also a Moon Treaty, created in 1979, that bans property rights on the moon and requires equitable use of lunar resources by all nations. But the Moon Treaty is [mostly toothless](https://www.thespacereview.com/article/1954/1); no country that has launched humans into space ever signed it.

The force of those treaties was never certain. But now that there’s possible money at hand, individual countries are openly defying the treaties—writing laws under their own steam to allow property rights in the heavens. In 2015, Obama signed the [SPACE Act](https://psmag.com/social-justice/outer-space-treaties-didnt-anticipate-the-privatization-of-space-travel-can-they-be-enforced), which explicitly gives U.S. firms the rights to any resources they mine from a celestial body. The Trump administration is [actively pushing](https://www.theguardian.com/science/2020/may/05/trump-mining-moon-us-artemis-accords) for firms to mine the moon. Other countries courting New Space firms—[hello, Luxembourg](https://www.technologyreview.com/2019/11/26/131822/why-its-now-the-perfect-time-to-start-a-small-space-agency/)—are following suit.

History, of course, would suggest that treaties crumble when serious money comes into play. Western settlers signed treaties with indigenous people in the Americas, then ignored them, as Lucianne Walkowicz, an astronomer at the [Adler Planetarium](https://www.adlerplanetarium.org/) and another cofounder of the JustSpace Alliance, noted.

“In many cases,” she told me, “treaties are good until somebody discovers something that they want.” She’s a fan of the Outer Space Treaty, finding it “a very, like, hopeful, peaceful, almost Star Trek-esque view of what space is.” She hopes it proves stronger than it looks.

Historically, however, law tends to follow the facts on the ground rather than shape them. When a new geography for commerce opens, whoever shows up first to exploit the resources sets the norm—and then law is written to validate the first movers. “‘First come, first serve’ is essentially what’s going to happen when people start to do things on the moon,” Peter Ward, author of [The Consequential Frontier](https://www.penguinrandomhouse.com/books/610858/the-consequential-frontier-by-peter-ward/), said.

Yet before the great water rush on the moon starts in earnest, one key point is worth pausing over: The supply of ice on the moon is limited. The estimated water reserves up there may be eye-popping at first glance, but they’re not that big. They likely add up to “three to five cubic kilometers of water, based on the studies that have come up,” said James Schwartz, a philosopher who also studies the ethics of space exploration. “Not a lot of water compared to even moderate- or small-size lakes on Earth.” It wouldn’t be that hard for a concerted explosion of commercial activity to chew through it all.

That may sound far-fetched, but, as all these space ethicists note, to the eyes of nineteenth-century explorers and industrialists, our planet seemed limitless, too—and it only took another century-plus of rapid commercial activity to tear through a diminishing store of finite resources. The environmental implications of exhausting the moon seem ludicrously sci-fi and far-off right now, and they’ll remain so for a long time—until, abruptly, they’re not. As with low-Earth orbit, outer space becomes much smaller and more cramped when you start thinking at commercial scale.

In any event, the moon is chiefly envisioned as a way-station project among the most ambitious cohort of space privatizers. A settled moon colony would serve as the push-off point for the main event, commercially speaking, for New Space entrepreneurs: mining the asteroid belt.

Asteroids are almost comically rich in precious materials. The asteroid Ryugu, for example, has about $82 billion in nickel and iron, according to the “[Asterank](https://www.asterank.com/" \t "_blank)” asteroid-value–ranking project. Another, Bennu, boasts a cool $669 million worth of iron and hydrogen. “You could totally collapse the gold and platinum market on Earth by mining asteroids,” joked Jacob Haqq Misra, a senior research investigator with the [Blue Marble Space Institute of Science](https://www.bmsis.org/), a nonprofit that encourages space exploration.

But there’s a hitch: Nobody has much of an idea how you’d actually mine an asteroid. Despite what you’ve seen in lumbering sci-fi epics like Armageddon, merely grabbing hold of a comparatively small, city-block–size object in microgravity is a forbidding physics puzzle—to say nothing of actually refining whatever you find.

One thing’s clear, however: In order to reach an asteroid, you’d need a lot of fuel for robotic probes. (Oxygen, too, if you’re bringing along a human crew.) This would likely be too expensive to do from Earth, given its gravity. The moon, on the other hand, is a sweet spot to base one’s commercial mining endeavors: enough gravity so humans can live in a base and assemble a rotating corps of mining robots, but sufficiently little gravity that launching mining probes at asteroids is easy.

“It takes so much energy to escape Earth’s orbit, by the time you do that, you’re basically halfway to anywhere in the universe,” Anderson said. “The moon as a launchpad—there’s a lot of commercial value there.”

Some New Space firms harbor still greater plans, in line with the classic “civilizing mission” that animated so many colonial land rushes in recent terrestrial history. Jeff Bezos wants to build space stations that rotate fast enough to simulate Earth gravity—and large enough to host entire cities full of residents. It’s a vision he built from a youth steeped in sci-fi. At Princeton, he took a class with Gerard O’Neill, a physicist who’d been [arguing since the 1960s](https://www.bloomberg.com/news/articles/2019-05-13/why-jeff-bezos-s-space-habitats-already-feel-stale) that humanity had to slip the surly bonds of Earth in order to survive over the long haul. O’Neill argued that living in space and mining asteroids represented the only path forward for the human race to continue growing and prospering without laying waste to planet Earth. He laid it out as a simple proposition of geology: If you were to mine the entire Earth down half a mile, leaving it a honeycombed crater, you’d still only get 1 percent of the metals and substances from the three biggest asteroids.

Bezos has eagerly endorsed the space-colony vision. In the short term, Bezos’s plans are the standard-issue vision for the New Space entrepreneur: building rockets and spacecraft that NASA will hire in order to resume landing astronauts on the moon. But in the long run—decades hence—building space colonies is, as he has argued, the only mission he can find big enough to devote his life and riches toward. “The only way that I can see to deploy this much financial resource,” Bezos [told Business Insider](https://www.businessinsider.com/jeff-bezos-interview-axel-springer-ceo-amazon-trump-blue-origin-family-regulation-washington-post-2018-4), “is by converting my Amazon winnings into space travel.”

The unexpected costs of Bezos-style space exploitation are, as yet, a little distant—decades, at least. But if there’s one thing we’ve learned from observing the human and environmental wreckage of the industrial era, it’s that history is like space travel: The path you set at the beginning is critical. Changing course later on is much harder. So it behooves us to plan now. Are there ways to avoid the worst possible outcomes in space? How is commercial life in space going to unfold?

The world’s small community of space ethicists has, in recent years, been increasingly pondering this, and they’ve come to some unsettling conclusions. First off, they note, the big winners in space will likely be ... the big winners on Earth. “I think it’s going to benefit the wealthy people that are running these mining firms,” Schwartz said bluntly. There are, as New Space investors today will tell you, winner-take-all dynamics. Bezos built a supply chain that is helping Amazon gradually dominate the world. Space will probably have room for only a few winners. So in order to envision the future contours of space conquest, it’s probably a safe bet to take all the harms of monopoly we see on this planet and project them on to a literally cosmic scale.

And that leads, in turn, to a corollary prophecy: Human rights in space are likely to be execrable, if they’re left up to the private sector.

Consider that anyone working in space will be reliant upon their employer for the most basic stuff of life. That’s not just food and water, but breathable oxygen, on a minute-by-minute basis. Plenty of science fiction has, over the years, war-gamed the bleak implications of these precarious situations. In Ridley Scott’s [Alien](https://www.imdb.com/title/tt0078748/) (1979), the employees of “The Company” are sent unwittingly to encounter a vicious alien life-form, with The Company hoping it would get a profitable specimen out of this. More recently, the TV show [The Expanse](https://www.imdb.com/title/tt3230854/) depicts the lives of asteroid miners as an outright form of slavery. One could, again, regard this as the typical pessimism of left-wing creative types—until one ponders workers’ rights on Earth as they exist now. Employees in Amazon’s warehouses are already [peeing into bottles](https://www.theverge.com/2018/4/16/17243026/amazon-warehouse-jobs-worker-conditions-bathroom-breaks) and [collapsing from heat exhaustion](https://www.businessinsider.com/amazon-warehouse-2011-9) in their attempt to satisfy their employer’s relentless work quotas; imagine if the company also controlled their breathable air.

Charles Cockell is a professor of astrobiology at the University of Edinburgh who’s written at length about the question of freedom in space settlements. He’s generally a libertarian, so he’s concerned about concentrations of power in both governments and private-sector firms in space.

“The controls on freedom of movement on the moon or Mars are worse than in North Korea,” he told me. “You can’t just walk out of a settlement.” Control of oxygen, he predicted, will empower the worst instincts of authoritarians of any stripe. “It will attract the coercively inclined and petty officialdom like all these things do…. It will attract people who crave power. You have to assume that that will lead to tyranny.”

These thought experiments don’t all conclude in grim dead-ends, however. There’s a whole arm of space ethics and philosophy devoted to asking the questions: Could the prospect of settling space positively serve society and justice? Could it offer up new ways of thinking about how we organize civic relations?

Coping with scarcity in space might impel settlers to reconsider some of the basic tent­poles of Western society. One is prison: On Mars, jailing someone would cost billions. A settlement would, as the astrophysicist and ethicist Nesvold noted, wonder, “Is it even worth it?” They’d be far more liable to consider styles of justice that don’t involve locking people up. The same goes for environmental thinking. Water and air will be so precious to space settlers that “the people who are living in space are going to be much more concerned about resource conservation,” Schwartz said. “It could be the attitudes that we get there are ones that are helpful to send back [to Earth].”

The idea of space as a fresh slate for political thinking is enticing. But it’s hemmed in by the very nature of the market forces currently reaching for the skies. Would any private-sector firms heading to space agree to limit their power when they’re beyond Earth’s grasp? Nesvold and Lucianne Walkowicz think it’s possible. There is, they believe, a window of opportunity right now, while commercial space activity is still ramping up, to convince everyone in New Space—from the firms to their early (and crucial) governmental clients—to take space ethics seriously. They’ve been pursuing two tracks of inquiry along these lines: first, talking directly to New Space companies about the political, social, and environmental aspects of space exploitation. (The smaller firms, Nesvold noted, are often eager to talk; the big ones—the SpaceXs and Blue Origins—not so much.) Walkowicz has also been holding public events to get everyday citizens to discuss, as she put it, “becoming interplanetary.”

“I think making the infrastructure of getting to spaceflight cheaper and more sustainable, reusable, all of that stuff is great—I love watching rocket launches as much as the next person,” Walkowicz told me. But she wants a much broader cross-section of the public to have a voice on how space is used. As she frames things, it’s a simple matter of public accountability: For all the self-mythologizing among New Space titans about the new, scrappy, and libertarian cast of modern space exploration, it’s still NASA—and by extension, the people’s treasury—that’s projected to supply the biggest revenue stream for much New Space activity today, and in the near future. In other words, we the people are paying for many of these rocket launches, and the huge outlays that will help bankroll the hard stuff, like future human colonies on the moon.

So the public ought to have more input on how the projected settlement and exploitation of outer space actually happens. Walkowicz and Nesvold want to create a bigger sample of people informed about the stakes in the new space race, people who’d lobby Congress to help lay down the new American road rules for space—from keeping orbits clean to the question of who gets to ride on those taxpayer-funded rockets in the first place.

Space, in other words, needs to be “decolonized.” That’s a coinage gaining currency among some space thinkers, including Lindy Elkins-Tanton. She’s a planetary scientist with one foot in the world of New Space, and another in the world of space ethics. She’s the head of the NASA [“Psyche” project](https://www.jpl.nasa.gov/missions/psyche/), which is launching a probe next year to explore the metallic asteroid Psyche. On the one hand, she is herself benefiting directly from the lower costs that New Space has created, so she’s generally a fan of commercial interests making space more viable. Her probe will launch on a SpaceX rocket, and it’s so much cheaper than NASA’s older launches that it makes her science far more affordable. (“I’m sure I’m not supposed to tell you, but I’ll tell you: It’s a lot of money,” she said.)

Yet as Elkins-Tanton noted, the story of new frontiers being settled is the history of colonization, fueled by moneyed interests. Whether it was Europeans heading to North America or Africa or parts of Asia, it was generally huge state interests putting up the money for risk-taking explorers—with the explorers getting rich, the states amassing power, the new frontiers becoming gradually stripped of resources, and their indigenous populations either killed or impoverished.

“Decolonization,” as she and other New Space ethicists put it, would be a different route. It’d be the act of exploring space with that history in mind, and working deliberately in concert to avoid its brutalities. What would that mean? Elkins-Tanton argued, like Walkowicz and Nesvold, that any voyages to space need to have much greater democratic participation. For years, she’s been organizing annual projects that bring together a disparate array of thinkers—astrophysicists, artists, indigenous scholars—to plan for things such as how a Mars colony might exist without becoming a human rights nightmare.

#### Private space companies vastly outpace the public sector and avoid regulation which makes it a uniquely dangerous industry

**Rauenzahn et al, 20** (The Regulatory Review, 6-6-2020, accessed on 1-14-2022, The Regulatory Review, "Regulating Commercial Space Activity | The Regulatory Review", https://www.theregreview.org/2020/06/06/saturday-seminar-regulating-commercial-space-activity/)azhang

Scholars address possible strategies to regulate an emerging commercial space industry. After much anticipation, the United States launched a manned rocket ship for the first time in almost a decade. The launch marked a new era of space travel as Elon Musk’s SpaceX became the first private company to transport astronauts to space. But the transformation of spaceflight from a public endeavor to a commercial industry raises questions about how to regulate the activities of private entities in space. In 2014, the National Aeronautics and Space Administration (NASA) outsourced the task of transporting its astronauts, granting billion-dollar contracts to SpaceX and Boeing in a program called Commercial Crew. NASA astronauts Doug Hurley and Bob Behnken became the first crew to enter space under this public-private program. Over the next few decades, NASA plans to rely on this commercial partnership to pursue even more ambitious goals: returning to the moon and sending astronauts to Mars. But private companies have their own aspirations for outer space. Musk hopes to use SpaceX to start a human colony on Mars. Amazon’s Jeff Bezos also has his sights set on space colonization, and firms such as Bigelow Aerospace and Axiom Space plan to develop their own space stations. Some investors see opportunities in space tourism and mining. But these for-profit goals raise serious concerns about who can claim ownership of space resources and what law will govern private activity in uncharted frontiers. International space law is governed by a 1967 agreement known as the Outer Space Treaty⁠. The treaty allows all nations to use and explore the moon and celestial bodies, prohibits claims of sovereignty, and it requires nations to oversee the activities of private space companies. But existing space law has not kept up with the growth in the private sector, and the United States lacks a comprehensive regulatory regime. In anticipation of a growing commercial space industry, some experts and scholars call for more robust regulation. This week’s Saturday Seminar focuses on possible legal frameworks for governing commercial activity in outer space.

#### Space dust wrecks satellites and debris exponentially spirals

Intagliata 17 [(Christopher Intagliata, MA Journalism from NYU, Editor for NPRs All Things Considered, Reporter/Host for Scientific American’s 60 Second Science) “The Sneaky Danger of Space Dust,” Scientific American, May 11, 2017, <https://www.scientificamerican.com/podcast/episode/the-sneaky-danger-of-space-dust/>] TDI

When tiny particles of space debris slam into satellites, the collision could cause the emission of hardware-frying radiation, Christopher Intagliata reports. Aside from all the satellites, and the space station orbiting the Earth, there's a lot of trash circling the planet, too. Twenty-one thousand [baseball-sized chunks](https://www.scientificamerican.com/article/orbital-debris-space-fence/) of debris, [according to NASA](https://www.orbitaldebris.jsc.nasa.gov/faq.html). But that number's dwarfed by the number of small particles. There's hundreds of millions of those. "And those smaller particles tend to be going fast. Think of picking up a grain of sand at the beach, and that would be on the large side. But they're going 60 kilometers per second." Sigrid Close, an applied physicist and astronautical engineer at Stanford University. Close says that whereas mechanical damage—like punctures—is the worry with the bigger chunks, the dust-sized stuff might leave more insidious, invisible marks on satellites—by causing electrical damage. "We also think this phenomenon can be attributed to some of the failures and anomalies we see on orbit, that right now are basically tagged as 'unknown cause.'" Close and her colleague Alex Fletcher modeled this phenomenon mathematically, based on plasma physics behavior. And here's what they think happens. First, the dust slams into the spacecraft. Incredibly fast. It vaporizes and ionizes a bit of the ship—and itself. Which generates a cloud of ions and electrons, traveling at different speeds. And then: "It's like a spring action, the electrons are pulled back to the ions, ions are being pushed ahead a little bit. And then the electrons overshoot the ions, so they oscillate, and then they go back out again.” That movement of electrons creates a pulse of electromagnetic radiation, which Close says could be the culprit for some of that electrical damage to satellites. The study is in the journal Physics of Plasmas. [Alex C. Fletcher and Sigrid Close, [Particle-in-cell simulations of an RF emission mechanism associated with hypervelocity impact plasmas](http://aip.scitation.org/doi/full/10.1063/1.4980833)]

#### Early warning satellites going dark signals attacks – causes miscalc and goes nuclear

Orwig 16 [(Jessica, MS in science and tech journalism from Texas A&M, BS in astronomy and physics from Ohio State) “Russia says a growing problem in space could be enough to spark a war,” Insider,’ January 26, 2016, <https://www.businessinsider.com/russia-says-space-junk-could-spark-war-2016-1>] TDI

NASA has already warned that the large amount of space junk around our planet is growing beyond our control, but now a team of Russian scientists has cited another potentially unforeseen consequence of that debris: War. Scientists estimate that anywhere from 500,000 to 600,000 pieces of human-made space debris between 0.4 and 4 inches in size are currently orbiting the Earth and traveling at speeds over 17,000 miles per hour. If one of those pieces smashed into a military satellite it "may provoke political or even armed conflict between space-faring nations," Vitaly Adushkin, a researcher for the Institute of Geosphere Dynamics at the Russian Academy of Sciences, reported in a paper set to be published in the peer-reviewed journal Acta Astronautica, which is sponsored by the International Academy of Astronautics. Say, for example, that a satellite was destroyed or significantly damaged in orbit — something that a 4-inch hunk of space junk could easily do traveling at speeds of 17,500 miles per hour, Adushkin reported. (Even smaller pieces no bigger than size of a pea could cause enough damage to the satellite that it would no longer operate correctly, he notes.) It would be difficult for anyone to determine whether the event was accidental or deliberate. This lack of immediate proof could lead to false accusations, heated arguments and, eventually, war, according to Adushkin and his colleagues. A politically dangerous dilemma In the report, the Adushkin said that there have already been repeated "sudden failures" of military spacecraft in te last two decades that cannot be explained. "So, there are two possible explanations," he wrote. The first is "unregistered collisions with space objects." The second is "machinations" [deliberate action] of the space adversary. "This is a politically dangerous dilemma," he added. But these mysterious failures in the past aren't what concerns Adushkin most. It's a future threat of what experts call the cascade effect that has Adushkin and other scientists around the world extremely concerned. The Kessler Syndrome In 1978, American astrophysicist Donald Kessler predicted that the amount of space debris around Earth would begin to grow exponentially after the turn of the millennium. Kessler 's predictions rely on the fact that over time, space junk accumulates. We leave most of our defunct satellites in space, and when meteors and other man-made space debris slam into them, you get a cascade of debris. The cascade effect — also known as the Kessler Syndrome — refers to a critical point wherein the density of space junk grows so large that a single collision could set off a domino effect of increasingly more collisions. For Kessler, this is a problem because it would "create small debris faster than it can be removed," Kessler said last year. And this cloud of junk could eventually make missions to space too dangerous. For Adushkin, this would exacerbate the issue of identifying what, or who, could be behind broken satellites. The future So far, the US and Russian Space Surveillance Systems have catalogued 170,000 pieces of large space debris (between 4 and 8 inches wide) and are currently tracking them to prevent anymore dilemmas like the ones Adushkin and his colleagues cite in their paper. But it's not just the large objects that concern Adushkin, who reported that even small objects (less than 1/3 of an inch) could damage satellites to the point they can't function properly. Using mathematical models, Adushkin and his colleagues calculated what the situtation will be like in 200 years if we continue to leave satellites in space and make no effort to clean up the mess. They estimate we'll have: 1.5 times more fragments greater than 8 inches across 3.2 times more fragments between 4 and 8 inches across 13-20 times more smaller-sized fragments less than 4 inches across "The number of small-size, non-catalogued objects will grow exponentially in mutual collisions," the researchers reported.

#### Nuke war causes extinction – it won’t stay limited

Edwards 17 [(Paul N. Edwards, CISAC’s William J. Perry Fellow in International Security at Stanford’s Freeman Spogli Institute for International Studies. Being interviewed by EarthSky/card is only parts of the interview directly from Paul Edwards.) “How nuclear war would affect Earth’s climate,” EarthSky, September 8, 2017, earthsky.org/human-world/how-nuclear-war-would-affect-earths-climate] TDI

We are not talking enough about the climatic effects of nuclear war. The “nuclear winter” theory of the mid-1980s played a significant role in the arms reductions of that period. But with the collapse of the Soviet Union and the reduction of U.S. and Russian nuclear arsenals, this aspect of nuclear war has faded from view. That’s not good. In the mid-2000s, climate scientists such as Alan Robock (Rutgers) took another look at nuclear winter theory. This time around, they used much-improved and much more detailed climate models than those available 20 years earlier. They also tested the potential effects of smaller nuclear exchanges. The result: an exchange involving just 50 nuclear weapons — the kind of thing we might see in an India-Pakistan war, for example — could loft 5 billion kilograms of smoke, soot and dust high into the stratosphere. That’s enough to cool the entire planet by about 2 degrees Fahrenheit (1.25 degrees Celsius) — about where we were during the Little Ice Age of the 17th century. Growing seasons could be shortened enough to create really significant food shortages. So the climatic effects of even a relatively small nuclear war would be planet-wide. What about a larger-scale conflict? A U.S.-Russia war currently seems unlikely, but if it were to occur, hundreds or even thousands of nuclear weapons might be launched. The climatic consequences would be catastrophic: global average temperatures would drop as much as 12 degrees Fahrenheit (7 degrees Celsius) for up to several years — temperatures last seen during the great ice ages. Meanwhile, smoke and dust circulating in the stratosphere would darken the atmosphere enough to inhibit photosynthesis, causing disastrous crop failures, widespread famine and massive ecological disruption. The effect would be similar to that of the giant meteor believed to be responsible for the extinction of the dinosaurs. This time, we would be the dinosaurs. Many people are concerned about North Korea’s advancing missile capabilities. Is nuclear war likely in your opinion? At this writing, I think we are closer to a nuclear war than we have been since the early 1960s. In the North Korea case, both Kim Jong-un and President Trump are bullies inclined to escalate confrontations. President Trump lacks impulse control, and there are precious few checks on his ability to initiate a nuclear strike. We have to hope that our generals, both inside and outside the White House, can rein him in. North Korea would most certainly “lose” a nuclear war with the United States. But many millions would die, including hundreds of thousands of Americans currently living in South Korea and Japan (probable North Korean targets). Such vast damage would be wrought in Korea, Japan and Pacific island territories (such as Guam) that any “victory” wouldn’t deserve the name. Not only would that region be left with horrible suffering amongst the survivors; it would also immediately face famine and rampant disease. Radioactive fallout from such a war would spread around the world, including to the U.S. It has been more than 70 years since the last time a nuclear bomb was used in warfare. What would be the effects on the environment and on human health today? To my knowledge, most of the changes in nuclear weapons technology since the 1950s have focused on making them smaller and lighter, and making delivery systems more accurate, rather than on changing their effects on the environment or on human health. So-called “battlefield” weapons with lower explosive yields are part of some arsenals now — but it’s quite unlikely that any exchange between two nuclear powers would stay limited to these smaller, less destructive bombs.

#### Space monopolies are uniquely dangerous – collisions, weaponized data, and consolidation all threaten effective commercialization of space. Goldstein 21

Luke Goldstein, 11-7-2021, "Why Are We Letting Monopolists Corner Space?," Washington Monthly, https://washingtonmonthly.com/2021/11/07/why-are-we-letting-monopolists-corner-space/

While space junk has existed for decades, it’s evolving into a full-blown crisis because of the sudden overcrowding of commercial space by SpaceX’s Starlink program and Project Kuiper, a subsidiary of Amazon. By next year, the companies combined could operate more satellites in low Earth orbit than have ever launched into space, dating back to the 1950s. The two companies are on track to hold a duopoly over the satellite communications market by rapidly deploying a new generation of satellite technology into low Earth orbit. These nanosatellites deliver fast internet connection by hovering far closer to Earth’s surface than the conventional geostationary satellites used by governments and satellite TV providers like Dish. Starlink already has close to 100,000 users who’ve signed up for its service, and it owns 1,500 active satellites, which is almost half of all satellites in low Earth orbit. The company is launching more every month at a breakneck pace. Amazon lags far behind, but it acquired licenses from the FCC in 2020 to begin launching a constellation of 3,000 satellites.The upsides of satellite technology shouldn’t be discounted. LEO satellites can provide high-speed and low-latency broadband to all corners of the world by flying in huge constellation forms to cover any targeted service areas. In a world where satellite service is widely available, millions of households neglected by telecom giants like AT&T and Verizon could be able to access high-speed internet service for the first time. If the industry is regulated and well managed, LEO satellite communications could finally bridge the digital divide and even provide a competitive alternative to fiber optic cable internet service providers. Jah recognizes the satellite industry’s potential, as he made clear in his testimony to the committee. He joined NASA because of his faith in the utopian potential of satellites to bring about new scientific discoveries and innovations. But Jah believes that government intervention is necessary to manage space debris and ensure that the financial gains of satellites don’t set us down a path of dystopian catastrophe. So far, government agencies have failed to devise a proper regulatory strategy for organizing space as a public good rather than a playground for the egotistical ambitions of billionaires. By rapidly approving both companies’ satellite fleets and showering SpaceX with subsidies, regulators have all but given Musk and Bezos the keys to a kingdom in the sky. SpaceX’s near-total control over the rocket launch business, which is a barrier to entry, and band spectrum licenses have made the company a de facto arbiter of Earth’s orbit. Monopolizing our satellite communications infrastructure would enrich Musk and Bezos while offloading major environmental, financial, and national security risks onto everyone else. As the companies expand their grip over the telecommunications sector, they’ll have unprecedented control over vast amounts of its users’ data, from web browser history to location tracking. These companies could also combine their access to customer data with satellite Earth-imaging capabilities, which would create a Truman Show-style system of surveillance beyond the imagination of dystopian sci-fi writers. It’s an immense amount of power and private information to put in the hands of two large tech companies. Following the fall of the Berlin Wall, the United States lost much of its military rationale for continuing the space race, and with the decline of public investment in general after the 1980s, NASA became a shadow of its old self. Yet other trends were also at work that favored private investment in space. The rise of Silicon Valley venture capital allowed for the funding of risky entrepreneurial projects that required high up-front costs. As with the internet itself, space also remained a largely unregulated frontier of commerce. As a result, a number of Silicon Valley bigwigs, most famously Bill Gates, began funding LEO satellite broadband companies to compete for communications dominance. They all went belly-up in disastrous bankruptcies. Sufficient demand for satellites still wasn’t there, and the rocket launch costs were still too high. Yet plenty of venture capital firms and other financiers remained eager to fund space projects. In the early 2000s, both Musk and Bezos seized the opportunity and founded SpaceX and Blue Origin to begin building rockets for private space exploration. The Falcon 9 reusable rocket was Musk’s killer app. For decades, commercial space development lagged because of unaffordable launch costs. The reusable rocket dramatically brought down the costs of operation, which allowed SpaceX to quickly ascend in the space market and win contracts with NASA to deliver cargo to the International Space Station. Supported by government contracts, Blue Origin has mostly supplied rocket parts for the public and private sectors before recently developing its own orbital launch vehicle. But now both companies are chasing a much broader customer base. In the developing world and even in much of rural America, lack of access to broadband is still the norm and increasingly threatens people’s ability to fully participate in modern life. Meanwhile, public frustration with telecom monopolies like AT&T, Verizon, and Comcast has reached an all-time high because of slower service and higher prices. This means there’s gold in satellites. Morgan Stanley estimates that the satellite communications sector alone will become a $400 billion business over the next two decades, and Musk and Bezos want as big a piece of that action as they can get.Musk founded SpaceX’s satellite program Starlink in 2015 as a revenue driver for funding his long-term fantasies of establishing a colony on Mars. For Bezos, Project Kuiper fills a similar purpose for the Amazon empire. As the space investor Chad Anderson put it in an interview with CNBC, Bezos looks at satellites in cold financial terms: It’s “4 billion new customers,” Anderson noted, who don’t yet have access to broadband. Both companies are using a new generation of LEO nanosatellite technology that can provide faster internet service by flying close to Earth’s surface. Their small size makes them more cost-effective to mass produce. By traveling in tightly knit mega constellations, the nanosatellites bounce radio transmissions between one another, creating a virtual grid across the band spectrum. This technology has allowed Starlink and Project Kuiper to hit the threshold for high-speed broadband, notching 50Mbps to 150Mbps with low latency (a measure of the lag time for wireless connection). The companies are betting that if they keep improving the speed and lowering their prices they’ll eventually be able to compete against fiber optic cable. Yet while the upside potential of this technology should be obvious, monopolization and lack of sensible regulation threaten to bring us a dystopia of crashing space junk and rule by plutocrats. There’s only a limited amount of LEO room for satellite companies to operate in. SpaceX and Amazon have built their business strategies around this constraint by moving rapidly to launch thousands of satellites and occupy the atmosphere before it fills up. SpaceX is the furthest along. The company already owns almost half of all satellites currently in low Earth orbit. It’s launching almost 120 per month to build out its constellation of 12,000—more than the total number of satellites that have ever been in the sky. Musk is currently seeking the go-ahead for an additional 30,000 from U.S. and international regulators to reach his stated goal of operating a constellation of 42,000. Amazon has played second fiddle to SpaceX but is gaining momentum. While the company doesn’t yet operate any satellites, it has received approval for 3,000, which is almost as many as the total number of satellites currently in low Earth orbit. Based on its beta tests, the company claims it can match, if not improve on, the internet speed of Starlink. SpaceX has outpaced competitors in part because of the reusable rocket and the launch pads it controls, which help save costs on production. Yet much to Musk’s advantage, the company also prospers from favorable treatment by the government. Critically, the two most important American regulatory agencies for overseeing satellite commerce, the Federal Communications Commission and the Federal Aviation Administration, have played an active role in enabling SpaceX’s power play for satellite dominance. The FCC routinely approves Starlink’s fleets with little oversight, awards them millions of dollars in subsidies, and issues the company exclusive licensing permits to low-altitude levels in Earth’s orbit out of reach for competitors. Since 2018, when SpaceX first got approval for their mega constellation, the FCC has signed off on Starlink’s 12,000 satellites; in 2020, it voted unanimously to approve Amazon’s request to build out a constellation of 3,236 satellites over the next four years. Critics have attacked the FCC’s lax approach, describing it as operating simply on a first come, first served basis. Most of the satellites currently in low Earth orbit were approved under the chairmanship of the Trump appointee Ajit Pai. The agency also does not properly account for environmental hazards or collisions, or even make sure that the companies seeking approval offer the best service. That’s especially relevant when it comes to SpaceX. The company reported malfunctions in around 5 percent of its satellites in 2019 due to technical flaws. Although there’s no standardized metric for satellite failures, experts worry that the massive scale of Starlink’s constellation will magnify the damaging effects of its satellite failures. Rivals have also pointed to customer dissatisfaction with Starlink’s service, claiming that it isn’t as fast as advertised. None of these complaints have apparently given the FCC pause in approving Starlink’s fleets. The FCC’s auctioning process for band spectrum licenses has come under increasing scrutiny as well. The broadband spectrum where radio transmissions travel is the equivalent of atmospheric real estate: There’s only so much valuable land. To receive regulatory approval, companies first need to purchase licensing for both the atmospheric real estate and the allotted band spectrum “blocks” for radio transmissions, which has become a hot market. SpaceX has quickly bought up these licensing rights and crowded out other competitors by blocking them from trespassing in its spectrum. In the early 2000s, the FCC made a rule change that allowed companies to trade and lease out these band spectrum licenses, creating a kind of shadow market for trading space property. As low Earth orbit has become overcrowded, the licensing permits have become a highly coveted commodity. SpaceX and Amazon have taken advantage of the auctioning process for the highest bidder, which tilts the playing field toward bigger companies with deep pockets. In April, the FCC handed down a controversial ruling on SpaceX’s licenses that effectively gives the company near-total control over the lowest levels of Earth’s orbit. The agency expanded the licenses that SpaceX had already acquired to allow the company to move its existing satellite fleet closer to Earth’s surface, below 353 miles. Flying closer-to-ground stations will improve the company’s broadband speed and latency for customers. The decision caused an uproar among space competitors, who argue that the decision gives SpaceX an unfair advantage and increases the likelihood of collisions. Opponents of the decision, led by Dish and Amazon, also claim that the shift in the elevation angle between Starlink’s ground stations and lower satellites will disrupt the radio transmission from other companies’ satellites in higher orbit. In effect, the FCC has given SpaceX a monopoly over the most premium real estate for satellite service and locked out competitors. If that weren’t enough, the FCC also showers SpaceX with subsidies to provide broadband to rural areas. Without these government funds, Starlink’s business model—as with most of Musk’s enterprises—would rest on a house of cards. In December 2020, the FCC awarded the company almost a billion dollars as part of its “Rural Digital Opportunities Fund” program. An investigation from the watchdog organization Free Press, however, revealed that SpaceX applied for and won subsidies for non-rural areas that didn’t fall under the grant’s criteria, such as airports and empty parking lots in urban enclaves. Under the Biden administration, the FCC reviewed the subsidies and sent out letters requesting companies to self-report any misappropriated funding they received. This incident of overt fraud hasn’t stopped the agency from continuing to approve more Starlink satellite fleets to fly in the designated areas covered by the grant. There’s no end in sight to regulators funneling taxpayer dollars to SpaceX. The broadband speed requirements in the bipartisan infrastructure bill will allow Starlink to qualify for a wider array of lucrative government grants. In aggregate, government subsidies and military contracts have kept Musk’s Starlink operation afloat and allowed the company to under-price its competitors. To achieve an economy of scale and greater market share, Musk has also effectively engaged in predatory pricing to expand Starlink’s customer base. Customers who sign up for the Starlink program receive a kit that includes a user terminal to connect to the satellites, a mounting tripod, and a wireless router. According to its own disclosures, Starlink loses more than 50 percent on every kit it produces for customers to keep the price at $499 per package (and $99 per month for service). This puts a huge strain on competitors but has worked in Starlink’s favor. The company has added new customers at a rapid rate, with 20,000 in the month of July alone. While Project Kuiper hasn’t set its rates yet, the company is expected to match Starlink’s prices once it gets its fleet up and running. Such tactics kill competition and in the long term could lead to monopoly pricing, which is why, when previous new communications networks came along, such as telegraphs and telephones, Americans quickly realized the need to regulate how much they charged users. SpaceX’s march to dominance now also involves buying out the competition. The company recently made its first acquisition, which is expected to be the first of many to come. In August, it bought out Swarm Technologies, a promising satellite firm that specializes in Internet of Things (IoT) services for energy, shipping, and transportation. For SpaceX, which deals mainly with broadband for households, the deal expands its reach into IoT services. It also gives the company control of the spectrum licensing that Swarm received from the FCC. For industry insiders, the deal signals that the satellite market is headed toward a wave of mergers and acquisitions. According to a Bloomberg analysis, $3.6 billion has been spent so far this year on takeovers and joint ventures in the space industry, already surpassing the numbers from 2020. “There are too many small players right now, so we’re looking at a wave of consolidation,” says Aravind Ravichandran, an independent industry analyst and consultant who runs the influential TerraWatch Space podcast and blog, which covers the space industry.SpaceX and Amazon are expected to win the spoils of the coming period. Billions of dollars in investment have propped up a wealth of satellite start-ups but saturated the market. Because of the high capital costs for entry and equipment maintenance, most companies won’t be able to stave off bankruptcy unless they draw a large customer base. That means many of the currently listed companies will either go out of business, which could be destabilizing to the market, or start looking for acquisition partners. Two of SpaceX and Amazon’s biggest competitors, OneWeb and Intelsat SA, filed for Chapter 11 bankruptcy during the pandemic. OneWeb, which had long been seen as SpaceX’s main rival, survived after being bought out by the UK government. Only SpaceX and Amazon have the financial firepower to weather the storm of consolidation. As the industry centralizes around SpaceX and Amazon, data gathering and surveillance are becoming major concerns. In 2017, President Trump signed a bill revoking a set of Obama-era privacy protections that restricted telecommunications companies from collecting web browser search history, location tracking, and other data from its customers. By rescinding those protections, the bill opened the floodgates for selling personal information to third parties. It also led to the centralization of data, which makes it easier for massive breaches by hackers such as the recent T-Mobile cyberattack. The same rules apply for satellite communications. As the satellite communications sector attracts a broader customer base, Starlink and Project Kuiper will control even more users’ personal information. The companies could weaponize data collection to build more advanced business models that would help crush smaller satellite competitors. They can also sell that data for further profit at the cost of its users’ privacy, as Google and Facebook have done. Amazon already has a robust data collection business in its retail sector, which the company could pair with telecom data to become a truly terrifying micro-targeting data empire. Data collection isn’t a side story in the satellite business. Both companies could combine the traditional forms of data harvesting with satellite surveillance imaging, which is one of the highest-valued sectors in the industry. The Commerce Department has offered a helping hand to the satellite surveillance industry by eroding many of the limitations on Earth imaging. In 2020, the department lifted key restrictions on high-resolution images from satellites. Companies applauded the decision, but it set off alarm bells for privacy advocates, who warned that companies could now even track the movement of individuals. Mapping Earth’s activity has certain productive uses if it is tightly regulated. Satellite imaging could help farmers check on the health of their crops and provide data analytics for renewable-energy companies to monitor offshore wind farms. But the technology also has far more nefarious applications. Many Earth-imaging companies say openly on their websites that they can offer data analytics about the operations of a client’s competitors—in other words, spying for hire. Privacy advocates also predict that without legal constraints, Earth-imaging satellites could track individuals at the behest of large corporations, like an all-seeing eye in the sky. While Starlink doesn’t offer Earth imaging, there’s no technological barrier prohibiting it from doing so in the future. The company already exerts indirect control over the industry. In 2021, SpaceX signed a rideshare agreement with Planet Labs, the largest satellite imaging company, to give them access to the Falcon 9 for rocket launches. Once Starlink’s satellite fleets occupy most of Earth’s orbit, as it’s currently on track to accomplish, Earth-imaging companies will have to directly or indirectly deal with SpaceX. It also is an advantageous position for Musk to request images from these partners to spy on his competitors in the automobile or aerospace industries. It gives one company a huge amount of power over a troubling industry for privacy rights. These companies’ massive stores of data would also be especially vulnerable as high-priority targets for hackers. SpaceX’s dominance threatens to exacerbate other hazards as well. By flying at such low levels in the Earth’s orbit, Starlink is creating light pollution that interferes with astronomers’ ability to study space. SpaceX has tried applying a black coating to minimize the rays of light refracted off its satellites, but astronomers don’t think it will have much effect. Light pollution from satellites also interferes with the simple pleasure of enjoying a clear night sky. And, of course, SpaceX and Amazon’s massive satellite fleets will escalate the space junk crisis. Donald Kessler, a former NASA astrophysicist, warns that continually putting more and more satellites into low Earth orbit means that even a minor piece of debris from a collision or malfunction would create an effect like a giant sheet of glass shattering in the sky and trap Earth under an impenetrable dome of space debris. We would have to wait years, maybe even decades, before enough debris burned up in the atmosphere that we could access space again. These dystopian scenarios aren’t merely speculative fears. Just two satellite incidents—one collision involving an inactive Russian satellite in 2009 and another precipitated by a Chinese anti-satellite missile test in 2007—have produced a substantial amount of the debris currently in orbit and likely to remain there for decades. While the Department of Defense’s global surveillance network has tracked 30,000 pieces of junk in the atmosphere, debris specialists estimate that the number is far greater. This uncertainty makes it more difficult to accurately predict the risk of debris and avoid collisions. Even outside of these worst-case scenarios, space debris could cause serious problems. It could knock out key parts of the communications infrastructure, as well as other intelligence satellites owned by the U.S. government. “We need to secure the space orbit channels so that we avoid major disasters to our communications systems,” Mariel Borowitz, a professor at Georgia Tech who specializes in space policy and national security, told me.Collisions between different countries’ satellites could also spark international conflicts. Because LEO satellites fly at such high speeds, their movement can be imprecise and may cross into other band spectrums or across national borders. Since international agreements have only set vague guidelines for collisions, commercial satellite accidents could become a pretext for disputes between superpowers. In one scenario, Musk has warned about China shooting down his satellites for flying over parts of the country where they don’t have licensing. The Chinese Communist Party has put a premium on maintaining a closed internet, known as the “Great Firewall,” and might blame the U.S. if Starlink crossed over into their network. For similar reasons, Russia has also threatened to fine any citizen who signs up with Starlink. Musk has already strained our relationship with allies by clashing with European regulators over Starlink’s constellation. In 2019, the European Space Agency contacted Starlink about an urgent potential collision they detected with one of the company’s satellites. SpaceX never responded to the request, which forced the ESA to go into damage control and maneuver its satellites out of harm’s way. Since the incident, Europe has tried to counter Starlink’s influence in the region and invest heavily in their own satellite constellations. Fortunately, it’s not too late to take advantage of the promise of new satellite communications technology while also avoiding or minimizing the myriad environmental and societal threats it poses. That, of course, means more diligent technical oversight from regulatory bodies to ensure that satellites are built and operated with the highest safety standards. But it also means using public policy to structure commercial competition in space so it is both fair and efficient. In many ways, we have been here before. When new communications technologies emerged in the past, the U.S. government responded with legislation and regulatory frameworks for allocating key assets and managing competition. The evolution of law and regulation governing radio technology in particular has echoes of the current dilemma with satellite technology. In the 1920s, applications for new radio licenses came in at such a pace that the Commerce Department started approving licenses to almost anyone who applied. Since there was only a limited amount of radio spectrum, this created massive problems with radio interference. Congress responded with the Radio Act in 1927, which set more stringent criteria for reviewing licensing applications. Rather than give them out on a first come, first served basis, much less sell them to the highest bidder, station licenses went to applicants who could best demonstrate their ability to serve the public as stewards of a radio spectrum commonweal. Later legislation further managed competition by putting breaks on any tendency toward monopoly. Until many of these strictures were repealed in the 1980s and ’90s, this meant limiting the number of stations any one person or corporation could control, prohibiting station owners from vertically integrating into ownership of other forms of media, and even requiring that radio stations devote a share of their airwaves to balanced, public interest programming. Today, we need a new satellite communications bill that is of similar scale and scope and that takes on new issues as well. One example would be to ban satellite telecom companies from selling their customers’ data. Congress should also block satellite companies that offer telecom services from engaging in Earth imaging, and vice versa. As with the original Ma Bell telephone system, we should ensure that satellite owners don’t abuse their control of essential information technology by going into other lines of business that use such infrastructure, such as media or advertising companies or online retail. Because space is a global commons, solutions to our current satellite crisis will also require international collaboration and agreements. Moriba Jah, for example, is calling for governments to quantify how much space debris exists in orbit so they can track it and avoid collisions. His team at UT Austin’s Oden Institute has built an open-access database to pool information from national space programs across the world to provide an accurate estimate of space debris and its location. Jah also advocates setting up an international space traffic system with patrol officers to manage overcrowding. New space technologies could immensely benefit humanity, but to realize the benefits we can’t hand over this valuable resource to the domineering control of Elon Musk and Jeff Bezos. Instead, the government needs to establish rigorous oversight and enforce fair and efficient terms of competition so space junk and monopolization don’t ruin the final frontier forever.

### 1AC – Cosmic Colonialism

#### Advantage 2 is Cosmic Colonialism.

#### Private appropriation of outer space expands corporate colonialism.

Shammas and Holen 19 [(Victor L, a sociologist working at the Department of Sociology and Human Geography, University of Oslo; Tomas B., independent scholar in Oslo, Norway) “One giant leap for capitalistkind: private enterprise in outer space,” 1-29-2019, pg. 3-5] TDI

The 2010s may very well be remembered as the ‘Age of NewSpace', the decade when outer space was turned into a capitalist space, when private corporations pushed the price of launches, satellites, and space infrastructure downwards, exerting what industry insiders call the ‘SpaceX effect' (Henry, 2018), centered on the technological achievement of ‘reusability', recovering used rocket boosters for additional launches, promising to drastically reduce the price of going to space (Morring, 2016). As one report observes, ‘Not only has the number of private companies engaged in space exploration grown remarkably in recent years, these companies are quickly besting their government-sponsored competitors' (Houser, 2017). What the rockets, shuttles, ships, and landing pods will carry beneath their payload fairing or in their cargo hold, however, along with supplies and satellites, is the capitalist worldview, a particular ideology—just as Robinson Crusoe, in Marx’s ironic retelling in Capital, ‘having saved a watch, ledger, ink and pen from the shipwreck… soon begins, like a good Englishman, to keep a set of books' (Marx, 1976, p. 170), brings with him English political economy—'Freedom, Equality, Property and Bentham', as Marx (1976, p. 280) says elsewhere— to his desert island.

In early 2018, astronomers across the world learned that a New Zealand start-up, Rocket Lab, which aimed to launch thousands of miniature satellites into orbit around Earth (so-called ‘smallsats'), had planned to launch a giant, shining ‘disco ball'—the ‘Humanity Star'—into orbit around Earth. It was an elaborate marketing stunt masked by humanistic idealism. ‘No matter where you are in the world, or what is happening in your life', said Rocket Lab CEO Peter Beck, ‘everyone will be able to see the Humanity Star in the night sky' (Amos, 2018). Many astronomers expressed outrage at these plans, fearing that the light from the Human Star would threaten their ability to carry out scientific observations. But while these astronomers were incensed by the idea of a bright geodesic object disrupting their ability to carry out observations, concerns with the effects of the arrival of capitalistkind on their ability to collect data were non-existent. The astronomical community was angered by the idea of a material, concrete, visible object polluting “pure” scientific data, but it paid less attention to the (invisible and abstract) recuperation of the night sky as it was brought into the fold of capitalism.

In an interview, Beck was quizzed about the Humanity Star and asked by a reporter about the difficulties of generating profits in space (Tucker, 2018). To this Beck replied, ‘It has always been a government domain, but we’re witnessing the democratization of it…[I]t [is] turning into a commercially dominated domain'. Beck established an equivalence established between the dissolution of space as the rightful domain of states and the advent of profitmaking ventures as signs of ‘democratization'. In space, according to Beck’s logic, democratization involves the disappearance of the state and the rise of capital. The argument, of course, is impeccably post-statist: on this account, states are monolithic, conservative Leviathans beyond the reach of popular control; corporations, on the other hand, are in principle representatives of the everyman: in the age of the start-up, any humble citizen could in theory become an agent of disruption, a force for change, an explorer of space, and a potential member of the cadre of capitalistkind. Following this logic, the question for the entrepreneurs of NewSpace is how to monetize outer space, which means turning space into a space for capital; their question is how they can deplanetarize capital and universalize it, literally speaking, that is, turn the Universe into a universe for capital. In this light, Peter Beck’s distortion of democratic ideals appears eminently sensible, equating democratization with monetization, that is, capital liberated from its earthly tethers.

Emblematic of this capitalist turn in space was the founding of Moon Express in 2011, composed of a ‘team of prominent Silicon Valley entrepreneurs…shooting for the moon with a new private venture aimed at scouring the lunar surface for precious metals and rare metallic elements' (Hennigan, 2011). Following Google’s Lunar XPRIZE—an intertwining of Silicon Valley and NewSpace’s capitalistkind—which promised a $20 million prize for the first private company to land a spacecraft on the Moon, travel 500 meters, and transmit high-definition images back to Earth, all by March 2018,9 Moon Express claimed that it would be capable of landing on the lunar surface and earn the cash prize. Their stated goal was twofold: first, to mine rare resource like Helium-3 (a steadily dwindling scarce resources on Earth), gold, platinum group metals, and water, and, second, to carry out scientific work that would ‘help researchers develop human space colonies for future generations' (Ioannou, 2017). The ordering is telling: first profits, then humanity. These were the hollow, insubstantial promises of a venture-capitalized NewSpace enterprise: in early 2018, Google announced that none of the five teams competing for the Lunar XPRIZE, including Moon Express, would reach their stated objectives by the 31 March deadline and they were taking their money back (Grush, 2018). In this sense, it was typical for NewSpace in its formative years: a corporate field populated by (overly exuberant) private enterprises who promised more than they could deliver. But the belief in NewSpace is real enough. In a tome bursting with the optimism of NewSpace, Wohlforth and Hendrix claim that ‘the commercial spaceflight industry is transforming our sense of possibility. Using Silicon Valley’s money and innovative confidence, it will soon bring mass space products to the market' (2016, p. 7).

The trope of humanity plays a key role in the rhetoric of the adherents of NewSpace. To fulfill the objectives of NewSpace, including profit maximization and the exploitation of celestial bodies, the symbolic figure of a shared humanity serves a useful purpose, camouflaging the conquest of space by capitalism with a dream of humanity boldly venturing forth into the dark unknown, thereby also providing the legitimacy and enthusiasm needed to support bolster the legitimacy of NewSpace. So long as the stargazers and SpaceX watchers are permitted their fill of ‘collective effervescence', to use Durkheim’s (1995, p. 228) concept, capitalist entrepreneurs will be able to pursue their business interests more or less as they please. The spectacle of outer space is crucial in this regard.

Crucially, however, and despite this spectacle, SpaceX’s technology might not necessarily be more sophisticated than its competitors or predecessors. Some industry insiders have rebuffed some of the more the spectacular claims of NewSpace’s proponents, arguing that launch vehicle reusability requires a (perhaps prohibitively) expensive refurbishing of the rocket engines involved in launches: ‘The economics will depend on how many times a booster can be flown, and how much the individual expense will be to refurbish the booster…each time' (Chang, 2017). Reusability may be a technological dead-end because of the inherently stressful effects of a rocket launch on the launch vehicle’s components, with extreme limitations on reusability beyond second-use as well as added risks of malfunctions that customers and insurers are likely to wish to avoid. Furthermore, the Falcon Heavy still has not matched the power and payload capacity of NASA’s Saturn V, a product of 1960s military-industrial engineering and Fordist state spending programs. What SpaceX and other NewSpace corporations do with great ingenuity, however, is to manage the spectacle of outer space, producing outpourings of public fervor, aided by a widespread adherence to the ‘Californian Ideology' (Barbrook and Cameron, 1996), or post-statist techno-utopianism, in many postindustrialized societies.

The very centrality of these maneuvers has initiated a new phase in the history of capitalist relations, that of ‘charismatic accumulation'—certainly not in the sense of any ‘objective' or inherent charismatic authority, but with a form of illusio, to speak with Bourdieu, vested in the members of capitalistkind by their uncanny ability to spin mythologizing self-narratives. This has always been part of the capitalist game, from Henry Ford and onwards, but the charismatic mission gains a special potency in the grandiose designs of NewSpace’s entrepreneurs. Every SpaceX launch is a quasi-religious spectacle, observed by millions capable of producing a real sense of wonder in a condition of (legitimizing) collective effervescence.

Outer space necessarily reduces inter-human difference to a common denominator or a shared species-being. An important leitmotiv in many Hollywood science fiction movies, including Arrival (2016), is that a first encounter with an alien species of intelligent beings tends to flatten all human difference (including ethnoracial and national categories), thereby restoring humankind to its proper universality (see also Novoa, 2016). Ambassadors of Earth as a whole, not representatives of particular nations, step forth to meet alien emissaries. But even in the absence of such an encounter, the search for habitable domains (or rather, profitable locales) beyond Earth will necessarily forge a shared conception of the human condition, initiated with the Pale Blue Dot photograph in 1990. Typical of this sentiment are the words of the astronomer Carl Sagan, who famously observed of this photograph: ‘On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives'.

This naïvely humanistic vision has been one of the dominant tropes in the discourse on space since the 1950s, and it remains strong today, as with the claims of the United Nations Office for Outer Space Affairs (UNOOSA) that their task is to ‘uphold the vision of a more equitable future for all humankind through shared achievements in space'. This representational tendency mobilizes humanism to generate enthusiasm about space-related activities. But such representations are increasingly being recuperated by capitalist enterprise, so that it is not humankind but its modulation by space capitalists that will launch into the dark unknown. It is not humankind but capitalistkind that ventures forth. In early 2018, NASA was set to request $150 million in its 2019 budget to ‘enable the development and maturation of commercial entities and capabilities which will ensure that commercial successors to the ISS…are operational when they are needed', only one of many signs that space is becoming a space for capitalism. According to one estimate, the value of just one single asteroid would be more than $20 trillion in rare earth and platinum-group metals (Lewis, 1996), a precious prize indeed for profit-hungry corporations.10 Even the UNOOSA spoke vociferously in favor of the commercialization of space, appealing variously to the ‘industry and private sector' and elevating the ‘space economy' to a central pillar in its Space2030 Agenda (including the ‘use of resources that create and provide value and benefits to the world population in the course of exploring, understanding and utilizing space'), even as the UN agency falls back on a humanistic, almost social-democratic vision of the equitable distribution of benefits (and profits) from space mining, exploration, and colonization (UNOOSA, 2018).

We find evidence of this strategic humanism in all manner of pronouncements from NewSpace entrepreneurs. To take but one example: Naveen Jain, the chairman and co-founder of MoonEx, a lunar commercialization firm, has claimed that ‘from an entrepreneur’s perspective, the moon has never truly been explored'. The moon, Jain has claimed, ‘could hold resources that benefit Earth and all humanity' (Hennigan, 2011). We should note the recourse to the trope of all of humanity by this NewSpace entrepreneur, mimicked in the 1979 Moon Agreement, a UN treaty, which also held that the Moon’s resources are ‘the common heritage of mankind' (Tronchetti, 2013, p. 13).11 In a purely factual sense, of course, Jain is wrong: Google Moon offers high-resolution images of the lunar surface,12 and the moon has already been explored, in the sense of being mapped, albeit rudimentarily and with room for further data collection. Crucially, however, these cartographic techniques have not been put to capitalist uses: mapping minerals, for instance, or producing detailed schemata that might one day turn the Moon into a ‘gas station' for commercial space ventures, as Wilbur Ross, Trump’s Secretary of Commerce, has proposed (Bryan, 2018). What is lacking, in short, are capitalist maps of the Moon, i.e., a cartography for capital. But as Klinger (2017: 199) notes, even though no one is ‘actively mining the Moon' at present, at least ‘six national space programs, fifty private firms, and one graduate engineering program, are intent on figuring out how to do so'; furthermore, Klinger draws attention to mapping efforts that have revealed high an abundance of rare earth metals, thorium, and iron in the Moon’s ‘Mare Procellarum KREEP' region (Klinger, 2017, p. 203).

We have already noted that it is not humanity, conceived as species-being, a Gattungswesen, that makes its way into space. The term Gattungswesen, of course, has a long intellectual pedigree, harking back to Hegel, Feuerbach, Marx, and others. The term can ‘be naturally applied both to the individual human being and to the common nature or essence which resides in every individual man and woman', Allan Wood (2004, p. 17) writes, as well as ‘to the entire human race, referring to humanity as a single collective entity or else to the essential property which characterizes this entity and makes it a single distinctive thing in its own right'. Significantly, the adherents of NewSpace often resort to the idea of humanity in its broad universality (e.g., Musk, 2017), but this denies and distorts the modulation of humanity by its imbrication with the project of global (and post-global, i.e., space-bound) capitalism. It is precisely the sort of false universality implied in the humanism of the supporters of NewSpace that Marx subjected to a scathing critique in the sixth of his Theses on Feuerbach. Here Marx noted that the human essence is not made up of some ‘abstraction inherent in each single individual' (1998, p. 570). Instead, humans are defined by the ‘ensemble of social relations' in which they are enmeshed. Under NewSpace, it is not humanity, plain and simple, that ventures forth, but a specific set of capitalist entrepreneurs, carrying a particular ideological payload, alongside their satellites, instruments, and supplies, a point noted by other sociologists of outer space, or ‘astrosociologists' (Dickens and Ormrod, 2007a, 2007b).

#### NewSpace actors engage in historical revisionism that moralistically justifies endless accumulation by displacing neoliberal guilt.

Johnson ‘20 (Johnson, Matthew Robert. "Mining the high frontier: sovereignty, property and humankind’s common heritage in outer space." PhD diss., University of Technology Sydney. Faculty of Arts and Social Sciences, 2020-08-26; JPark)

* This card basically says that, independent from the actual material expansion of capitalism/exploitation that occurs in space, NewSpace erases historical narratives on the violence of neoliberalism and colonization by promoting a new form of Manifest Destiny that is guilt-free – similar to a T&Y move to innocence

The trope of the frontier speaks to both violent appropriation and – as it appears in NewSpace discourse – redemption and freedom. Frontier mythology has a highly emotive resonance: it appeals to individual and collective psyches through the frontier’s promise of liberation, salvation and re-birth. As Blouet notes, “states are clever in promoting ambitions in the cloak of emotional appeals” (1994, p.285). The European colonial powers claimed theirs was a ‘civilising mission’ (Said 1995), a valorous project of “bringing light, faith and trade to ‘the dark places’ of the earth” as they murdered and subordinated indigenous populations on the imperial horizon (Lindqvist 2002, p.12). Ever since the Apollo program, outer space has held an important place in the emotional fabric of American national culture. What mythic elements can we discern in NewSpace cosmopolitics? What stories is NewSpace telling to render its colonial project as commensurate with the ‘benefit of all mankind’? Political mythologies are not opposed to political rationality – they permeate and are indissociable from them (Dean 2006). Political economist Mitchell Dean has illustrated that “mythic, poetic and symbolic elements” permeate spatial and cartographic notions of political order (2006, p.1). Deploying Connery’s term ‘geo-mythography’ (2001), he describes the mythic foundations of Schmitt’s conceptions of nomos. For instance, Schmitt begins The nomos of the earth by saying: “In mythical language, the earth became known as the mother of law...” (Schmitt 2003, p.42). Pagan concepts of the Earth Mother are evident in Schmitt’s account, which also drew on his conservative Catholicism in noting the herdsman or shepherd in the etymological roots of nomos (ibid, p.339-340). Indeed, Schmitt focuses on the nomos of medieval Europe’s respublica Christiania, an empire with Holy Rome at its centre acting as katcheon or ‘restrainer’ of the Antichrist (ibid, pp.58-62; Dean 2006). The contrasts that Schmitt makes between terra firma and mare libre arrive at a sort of telluric mythos, his genealogy of spatial law and order invoking the “consecrated sites” and “sacred orientations” of landed existence (Schmitt, in Dean 2006, p.10). The NewSpace imaginary of course involves a break from the ‘Earth Mother’ – a point Ormrod has argued while drawing on Freudian psychoanalytics (2007, pp.266-7) – but geo-myths are nonetheless an important part of their public justifications for space colonisation. ‘Manifest Destiny’ is a geopolitical discourse that emerged from Enlightenment progress ideology and is evident in many phases of American history and in the NewSpace vision (Parker 2009). Beginning with the 19th century impulse to “conquer and civilize the ‘empty continent’”, it was the United States’ destiny to continue expanding (Ó Tuathail 1994, p.159). Like lebensraum, which had been inspired by Friedrich Ratzel’s visit to frontier America, manifest destiny was a means of justifying imperial expansionism. This geo- mythography was wedded to American exceptionalism: if expansionism was America’s ‘destiny’, the violence of this expansionism was morally justifiable. The political geographer Gerard Ó Tuathail summarises Manifest Destiny with the following quote from founding father Thomas Paine: “The cause of America...is in great measure the cause of all mankind” (1994, p.159). The idea that humanity needs space to expand on the off-world frontier is a techno- utopian version of Manifest Destiny. In his essay ‘Capitalists in Space’ (2009), Parker has noted the parallels between off-world expansionism and westward frontiers in American culture. He draws attention to the US historian Frederick Jackson Turner (1893), who had argued that when the westward journey ended on the Pacific Coast and the American frontier was effectively closed, it “augured badly for the future of the USA. American character was defined by novelty, adaptation and growth, so without this imaginative geography of a frontier, there was a danger of atrophy” (Parker 2009, p.89). I am reminded here of Gerard 208 O’Neill’s remark that a steady state economy would allegedly produce a constriction of innovation and creativity that would be “abhorrent” (in Kilgore 2003, p.159). For NewSpace and neoliberalism, Property represents Progress. Yet the notion of private property as inherently virtuous rests upon unstable myths (Christman 2014). Like American exceptionalism, the **valorisation of private property rights in the NewSpace** and neoliberal **imaginary** requires **erasing** or simply forgetting the **violence of enclosure and colonialism**. Space writer and policy analyst Rand Simberg produced Homesteading the Final Frontier (2012) for the Atlas Network’s Competitive Enterprise Institute. He asserts that: “...under the view of the universe as a frontier full of potential, the resources that could be developed from it offer great opportunity for human flourishing. Centuries of history demonstrate that the best means of doing that is via the free exchange of goods and services, undergirded by legally enforceable private property rights” (Simberg 2012, p.4). In Simberg’s view, ‘centuries of history’ validate private property – and not common property – as the driver of human flourishing. With the ahistoricity characteristic of neoliberalism and neoclassical economics, Simberg sweeps aside centuries of appropriation, displacement and violence that followed in capitalism’s imperial wake. The history of private property is tainted with discrimination, coercion and the heavy hand of empire – this is inconsistent with the truth claims of universal beneficence inherent in NewSpace private property advocacy (**regardless** of how violent or peaceful space colonisation ends up being). In his Mythologies (1973), Roland Barthes looked to capitalist myths. His description of the ‘privation of history’ offers some insight into NewSpace’s erasure of property’s violent past. According to Barthes, the privation of history was a myth of estrangement that divorced objects from their history. “Myth deprives the object of which it speaks of all History. In it, history evaporates. It is a kind of ideal servant: it prepares all things, brings them, lays them out, the master arrives, it silently disappears: all that is left for one to do is enjoy this beautiful object without wondering where it came from” (1973, p.165). Severing an object from its history – this is clearly taking place in NewSpace’s revisionist history of private property

#### It’s terrestrially unsustainable---underlying market principles, failed economic policy, and income inequality.

Jackson 19(Jackson, Tim--- ecological economist and professor of sustainable development at the University of Surrey. (2019). The Post-growth Challenge: Secular Stagnation, Inequality and the Limits to Growth. Ecological Economics, 156, 236–246. doi:10.1016/j.ecolecon.2018.10.010, sci-hub.tw/10.1016/j.ecolecon.2018.10.010) MWE

A decade after the financial crisis, growth rates in advanced economies have still not returned to those experienced in the pre-crisis era. A long-term decline in the rate of labour productivity growth is one of the underlying factors contributing to this situation. Understanding that long-term decline is clearly vital. Debt overhang, shifting patterns of demand and the geo-politics of resource supply all play some contributing role. Perhaps the most troubling possibility is that the wide-spread technological advances facilitated by ready abundance of high-quality energy resources in the first seventy years of the 20th century are no longer available to advanced economies in the 21st. Evidence of a decline in the quality of some physical resources already exists. Sooner or later further declines are inevitable. As they arrive, they are likely to depress labour productivity growth still further. The critical question is how policy should respond to this not-so- new reality. The conventional response has been to look for conditions – technological, fiscal, monetary – to keep growth going, whatever the cost. The prevalent ‘ rescue narrative ’ relies on an assumption that with appropriate policy incentives, new technological breakthroughs will emerge and productivity growth will recover. Candidate ‘ saviours ’ in this rescue narrative are various. For some (NCE 2014 2017), innovation will arrive from investment in the same clean, low-carbon technologies that are needed to tackle climate change and off set resource depletion. For others ( Ford, 2015; Avent, 2016 ), innovation will come from the emerging digital revolution: increased automation, robotisation, artificial intelligence. But to date, none of the productivity gains foreseen by these technologies have been manifest at the macro- economic level and this latter world could lead to the ‘ immiseration ’ of labour ( Susskind, 2017) and levels of inequality reminiscent of the worst scenarios outlined in the previous section. In historical perspective, it is clear that the advanced economies now stand at a distinct, and uncomfortable cross-roads. Two competing theories about how to maintain growth (Keynesianism and monetarism) have dominated macroeconomics over the last half century. Neither is adequate to the challenge of resolving current conditions. Developed in response to the Great Depression in the 1930's, John Maynard Keynes' macroeconomics saw a critical role for government in maintaining economic stability ( Keynes, 1936 ). If supply potential was not enough to keep growth going (as Says had argued), governments could not rely on households and firms simply to go on spending during the hard times. They must play an active role in stimulating the economy to ‘ kick-start ’ growth again. The strategy worked, up to a point. It was exemplified in particular by Franklin D Roosevelt's ‘ New Deal ’ in the States. The subsequent ‘ failure ’ of Keynesianism to solve the problems of ‘ stagflation ’ during the oil crises led to a temporary disillusionment with the idea and in the early 1980s, western governments (pre- dominantly led by the anglo-centric nations) abandoned Keynes and turned instead to monetarism – the brainchild of Chicago school economist Milton Friedman. Built on a neoliberal philosophy with a strong belief in the free market as the best regulator of human affairs, monetarism had no time for fiscal stimulus (or indeed with government intervention generally) and argued instead that the route out of low growth was to reduce the cost of money, so that firms would more easily invest in the productive capacity of the economy and households could fund any temporary constraints on spending through debt. These mechanisms for financial liquidity would free up the economy to grow again, allowing prices to fall and employment to bounce back. At first these policies seemed to be successful. In the wake of the oil crises, conditions improved. Greater liquidity spurred investment, re- stored levels of consumer demand and even (arguably) stimulated innovation in the energy sector which brought down the price of oil, for almost two decades. In the long run, however, things were not so simple. Loose monetary policy and tight fiscal policy were slowly creating increasing fragility in financial markets. Though they facilitated a continued reduction in public debt burdens, this only proved possible by transferring debt to the private sector. While interest rates were low and debt burdens were not too high, this didn't seem to matter much. But as more and more households accumulated more and more debt, the conditions for instability were accumulating. By the early 2000s, firms, banks and households had become ‘ overleveraged ’ . The policy response was to pump more and more money into the system by lowering interest rates again and relaxing financial regulations even further. All it needed was a change in the rate of defaults on ‘ subprime ’ loans and the bubble would have to burst. This was the era of ‘ easy money ’ , the ‘ age of irresponsibility ’ as then Prime Minister Gordon Brown called it, and it led inexorably to the financial crisis. 8 ‘ The question then arises, ’ wrote Summers (2014, p68) ‘ can we identify any stretch [in the last decades] during which the economy grew satisfactorily under conditions that were financially sustainable?. ’ His answer, and indeed the answer of a number of other mainstream economists, was: no. Chasing growth through loose monetary policy in the face of challenging underlying fundamentals had led to financial bubbles which destabilised finance and culminated in crisis. Perhaps the most pernicious impact of this period of loose monetary policy – and indeed of the crisis itself – was the steady rise in inequality within advanced nations. There were several channels through which this acceleration occurred. In the first place, cheap money led to financial speculation. Those with access to capital could achieve substantial capital gains as asset prices rose. When wealth is already unequally distributed, this tendency leads directly to higher income inequality. As income inequality increases, it leads to excessive investment funds, because richer households tend to have a high propensity to save than poorer ones. This excess of savings leads to more speculation, pushing asset prices up again and accelerating inequality further. It is also likely to depresses growth, partly through the reduced spending power of poorer households and partly through the crowding out of investment.

#### NewSpace valorizes private property and advances a new frontier to preserve the capitalist structure

Johnson ‘20 (Johnson, Matthew Robert. "Mining the high frontier: sovereignty, property and humankind’s common heritage in outer space." PhD diss., University of Technology Sydney. Faculty of Arts and Social Sciences, 2020-08-26; JPark) **[Bolded Brackets]** inserted for footnote clarity

5. Privateering the cosmic frontier: empire, myth and the violence of property93 There is an intractable link between national sovereignty and private property (Chapter 2), particularly as manifest in mining rights (Chapter 3). A neoliberal constitution has emerged in international law that fortifies corporate rights to extract from and pollute the global commons, as Atlas organisations pressure sovereign states to undermine alternate legal orders that recognise collective rights and responsibilities. NewSpace’s ‘constitutional’ arguments attempt to create a legal justification for private off-world resource appropriation in advance of this speculative project being realised (Chapter 4). In this chapter, we will move further into the realm of the anticipatory, as I discuss how state-corporate appropriation on the cosmic frontier might transpire. I will do this by counter-posing my own speculations against an episode in NewSpace myth-making, a tale of off-world privatisation. The now-defunct NewSpace start-up MirCorp had briefly privatised the Russian space station Mir – this was essentially NewSpace’s first and only corporate outpost in space. The story of MirCorp is told by NewSpace protagonists in the documentary film, Orphans of Apollo (2008). This text is arguably the zenith of the network’s anti-statist and anti-bureaucratic mythos: it is a paean to NewSpace entrepreneurialism that implicates NASA and the US Government in the failure of MirCorp, while simultaneously absolving speculative capital. The documentary invokes the figure of the pirate – the original extra-territorial anarcho-libertarian – and in doing so, it broaches the tension between national appropriation and private mineral ownership that is at the heart of this dissertation. I will use the Orphans’ pirate imagery as a heuristic for establishing precedents for space mining in the age of maritime colonialism (returning to themes I raised in section 3.2.1). I posit that the state-backed space mining firm bears closer resemblance to the privateers and charter companies of maritime colonialism: pirates for hire and commercial vanguards for empire, pushing back the frontier. To describe a place or space as a frontier is to give it an ostensibly geographical designation: it can describe the furthest extent of a civilisation, the periphery at spatial remove from the core (Wallerstein 1974). It can also denote areas that are particularly 182 difficult to access, like mountainous regions, jungles, deserts and outer space (Hall 2013, p.53). As Derek Hall notes in his political economy of land, “frontiers are areas where states fall well short of exercising administrative control” (2014, p.52). Yet using physical or political-geographic terms to describe frontiers is to neglect their cultural characteristics and their mythoi. The future studies scholar William Kramer (2014) reports on the ongoing use of frontier metaphors in NASA mission planning and lists the adjectives that can accompany frontier discourses and the role of the valorous pioneer within them. The frontier can be: “unknown, vast, lonely, godless, godforsaken, virgin, barren, unbroken, untamed, heathen, wild, desolate, savage, unforgiving, cold, hostile, foreboding, limitless, dangerous, uncivilized and even angry. These, then, contribute to the suite of terms that describe aspects of pioneers’ relationship to that frontier, such as fear, battle, challenge, assault, conquering, conquest, subduing, civilizing, and taming” (Kramer 2014, p.181). To varying extents, frontiers are anomic or lawless (anomos; discussed in section 2.3) – at least from the perspective of colonisers. Frontiers either lack a nomos, or there is an older, indigenous nomos that is displaced by a new colonial nomos through state-sanctioned violence (Walker 2013, pp.400-401). To tame, to conquer and to subdue – more than mere geophysical marker, ‘**the frontier’ indelibly connotes the violence of colonialism**. ‘The frontier’ has always been a central trope in NewSpace discourse, one in which discourses of individual freedom or deregulation merge with the inherent patriotism of the US-centred movement. The Tea Party in Space is one organisation that participates in the ‘March Storm’ or ‘August Blitz’ inter-organisational lobbying events held by the Alliance for Space Development (ASD 2019, p.1). In their policy platform, they state: “Only through fiscally responsible policy, which limits government bureaucracy and stimulates the free market, will the United States expand on its leadership in space. By removing barriers of entry to the utilization of the solar system, new business models become viable. This sound free-market-based approach will create new sectors of the economy and strengthen America as the vanguard of freedom and opportunity as we spread throughout the solar system. We will carry forth the American values that made our nation great. The United States will settle space as it settled the American continent. The days of Lewis and Clark, and Apollo, are over. This is the Oregon Trail space policy” (Tea Party in Space 2014). The Tea Party in Space’s platform invokes some historically durable motifs – not least of all the mythological figure of Apollo, namesake of the US’s lunar program. In addition to 183 neoliberal edicts of ‘fiscal responsibility’ and removing barriers to entry, the Tea Party in Space’s platform is, in their words, “grounded in American exceptionalism” (Tea Party in Space 2014). This exceptionalism is expressed in spatio-historic terms through the invocation of the frontier. NewSpace will ‘carry forth the American values that made our nation great’ onto unsettled celestial bodies like the civilian pioneers westward bound on the Oregon Trail. NewSpace believes it will be the exceptional, valorous entrepreneur who is skyward bound as ‘the vanguard of freedom and opportunity’ – America’s destiny manifest in a union with free- market capitalism. Parker (2009, pp.89-90) has noted the synergy between the westward frontier and the libertarian space frontier. Henry David Thoreau (1817-1862) had said, “Eastward I go only by force; but westward I go free” – on the frontier, one could “forget the Old World and its institutions” that lay across the Atlantic, because “we go westward as into the future” (2008 [1862]; Parker 2009, p.89). For libertarian space advocates, beyond the atmosphere lies an open expanse of extraterritorial liberty, an endless frontier in which to exercise one’s inalienable right to private property ownership, untethered to terrestrial polity or regulation. However, unacknowledged in the frontier romanticism of Thoreau and the Tea Party in Space is the fact that the Oregon Trail had been blazed, in large part, by the Hudson’s Bay Company (Douthit 1992). This British charter company was incorporated by King Charles II in 1670 for the purpose of "finding some Trade for Furs, Minerals, and other considerable Commodities...[from which] there may probably arise very great Advantage to Us and Our Kingdom” (Royal Charter of the Hudson’s Bay Company, HBC Heritage 2016). The Company was granted powers of de facto government, and had exercised the rights bestowed by the Crown “to send either Ships of War, Men or Ammunition...unto any their Plantations, Forts, Factories, or Places of Trade aforesaid, for the Security and Defence” of the land it had claimed along the fabled ‘pioneer’ trail from Missouri to Oregon (HBC Heritage 2016). Also missing from the above frontier mythologies is the fact that the American continent had been pioneered millennia before the arrival of early industrial civilisation. The indigenous societies that lived and worked the land prior to the Oregon Trail were often key sources of trade for Anglo-American wagon trains and, through disease and violence, were frequently killed through contact with white settlers. Far from forgetting the institutions of the Old World, “free from all worldly engagements” (Thoreau 2008), the frontier freedoms of white pioneers were enabled by European monarchical sovereignty – often expressed and solidified through 184 colonial violence. Myth-making is abundant in NewSpace. By myth, I mean both a falsehood and a ‘legend’ that “still powerfully conveys some important moral and social lesson” regardless of its veracity (Christman 2014, p.3). The mythic frontier appears in the policy platforms of NewSpace organisations.

#### The insistence on outer space as corporate capital’s spatial fix accelerates environmental degradation.

Shammas and Holen 19 [(Victor L, a sociologist working at the Department of Sociology and Human Geography, University of Oslo; Tomas B., independent scholar in Oslo, Norway) “One giant leap for capitalistkind: private enterprise in outer space,” 1-29-2019, pg. 6-8] julian

As Earth’s empty spaces are filled, as our planet comes to be shorn of blank places, capitalistkind emerges to rescue capitalism from its terrestrial limitations, launching space rockets, placing satellites into orbit, appropriating extraterrestrial resources, and, perhaps one day, building colonies on distant planets like Mars. But why limit ourselves to Mars? As of mid-2017, NASA’s Kepler observatory had discovered more than 5000 exoplanets—planets that seem like promising alternatives to Earth, located at an appropriate distance from their respective suns in the famed ‘Goldilocks zone'. These ‘planetary candidates', as they are known —that is, candidates for the replacement of Earth, capable of supporting human life with only minimal technological augmentation or cybernetic re-engineering—are above all viable candidates for selection by specific capitalists seeking to discover new profitable ventures beyond the limits of an Earth-bound capitalism. Space reveals the impotence of the neoliberal, postFordist state, its incapacity and unwillingness to embark on gigantic infrastructural projects, to project itself outwards, and to fire the imagination of (actual) humankind. Capitalistkind steps in to fill the vacuum left behind by a state that lacks what Mann (2012, p. 170) calls ‘infrastructural power'. The old question, the question of Old Space, was quite simply: is this planet a viable site for humankind, a suitable homeland for the reproduction of human life away from Earth? But the new question, the question for NewSpace, will be: can this celestial body support capitalistkind? Will it support the interests of capitalist entrepreneurs, answering to the capitalist desire for continued accumulation?

While some elements of the astrosociological community, such as the Astrosociology Research Institute (ARI),14 insist on elucidating the “human dimension” in outer space, Dickens and Ormrod recognize that this humanization-through-capitalism really involves the ‘commodification of the universe' (2007b, p. 2). While Dickens and Ormrod develop similar arguments to those sketched here—from their concept of an ‘outer spatial fix' to their argument about outer space becoming woven into circuits of capital accumulation—they were writing at a time when their remarks necessarily remained speculative: the commercialization of space was still in its infancy. In an inversion of Hegel’s owl of Minerva, reality has since largely confirmed their ideas and caught up with theory. Above all, when considering the various ventures ongoing in space today, it is not so much the universalizing human dimension as the specifically capitalist dimension that is striking. With the advent of NewSpace, outer space is becoming not the domain of a common humanity but of private capital.

The arguments laid out above mirror an ongoing turn in critical scholarship away from the notion of the Anthropocene towards a more rigorously political-economic concept of Capitalocene, premised on the ‘claim that capitalism is the pivot of today’s biospheric crisis' (Moore, 2016, p. xi). Just as the exponents of the concept of Capitalocene emphasize that it is capitalism, and not humanity as such, that is the driving force behind environmental transformation, so too does the notion of capitalistkind emphasize that it is not humankind tout court but rather a set of specific capitalist entrepreneurs who are acting as the central transformative agents of and in outer space, with the ‘ever-increasing infiltration of capital' into what was formerly the domain of the state (Dickens and Ormrod, 2007a, p. 6). We can also think about these issues in terms of what Philippopoulos-Mihalopoulos (2015) terms ‘spatial justice'. This concept captures the fact that struggles over justice are often struggles to occupy space, as the term is more conventionally understood, as with urban battles over the ‘right to the city' (Harvey, 2008), to provide just one example. But the same also holds true for outer space: there is an ongoing struggle over the right to take up space in outer space. So far, the capitalist side appears to be winning. As the proto-communism of the Cold War-era Outer Space Treaty is abandoned—in tandem with the increased technological feasibility of exploiting resources and accumulating profits in outer space—spatial justice in outer space increasingly comes to mean the ‘justice' of capital, capitalistkind taking the place of humankind. It is comparatively easy to declare that outer space is a commons, as the Outer Space Treaty did in the late 1960s, when that domain is, for all practical purposes, inaccessible to capital; with the heightened accessibility of outer space, however, it is unsurprising that central political agents, such as President Trump’s administration, should seek to dismantle this regulatory framework and ensure the smooth functioning of capital accumulation beyond the terrains of Earth.

What kind of capitalism is being projected into space? The complexity of state-market relations is sufficient to force us to hedge against a simplified reading of space commercialization: it is not a matter of states against markets, as if the two were mutually exclusive. Instead, as Bratton (2015) suggests, we are witnessing the emergence of a ‘stack', a complex intertwining of commercial, geopolitical, and technological concerns, which challenges previous notions of state sovereignty. This can be seen as a hybridized state-market form, with technology playing a central role in reciprocal processes of political and economic transformation. On the one hand, outer space was in some sense always already the domain of marketization, albeit to a limited extent, even during the Cold War, from the first commercial satellite launch in the early 1960s to President Ronald Reagan’s implementation of the Commercial Space Launch Act of 1984, which aimed to encourage private enterprise to take an interest in an emerging launch market. As Hermann Bondi, the head of the European Space Organization, wrote in the early 1970s, ‘It is clear…that there must be three partners in space, universities and research institutions on the one hand, the government on the second and industry on the third' (Bondi, 1971, p. 9).

On the other hand, outer space still remains firmly within the domain of the state and is likely to do so for the foreseeable future, with the likely continued importance of military uses of satellite technology and the weaponization of Earth’s orbit— crucially, the Outer Space Treaty only prohibits nuclear arms and other ‘weapons of mass destruction' in space, not conventional weapons, such as ballistic missiles. One novel element in this phase of capitalism-in-space is the interrelationship between Silicon Valley, NewSpace, and the state (see, e.g., Vance, 2015). Silicon Valley’s capitalist class, including Amazon’s Jeff Bezos, play an outsize role in NewSpace. Behind and around these figures, however, remains the state—through its weighty fiscal, regulatory, military, and symbolic investments.15 To take but one example: In June 2018, SpaceX won a $130 million contract with the U.S. Air Force to launch an ‘Air Force Space Command' satellite onboard a Falcon Heavy rocket (Erwin, 2018).

Fredric Jameson’s (2003, p. 76) oft-quoted observation that it is easier to imagine the end of humankind than the end of capitalism, is realized in the ideals and operations of capitalistkind. Elon Musk has observed that the goal of SpaceX is to establish humankind as a ‘multiplanetary species with a self-sustaining civilization on another planet' whose purpose is to counteract the possibility of a ‘worst-case scenario happening and extinguishing human consciousness' (Vance, 2015, p. 5). But couldn’t we view this idealistic assertion on behalf of humanity in another way? It is not human consciousness, over and against what the writer Kim Stanley Robinson (2017, p. 2) calls ‘mineral unconsciousness' (i.e., the mute, geological reality of the natural universe), so much as a specifically capitalist consciousness that is at stake. While the actions of capitalistkind may primarily be aimed at ensuring the future survival of the human species, an additional result is to ensure that the very idea of capitalism itself will outlive a (distantly) possible extinction event. Capitalism is a self-replicating system, pushing to expand ever outwards, using a territorializing strategy of survival. As David Harvey notes, ‘a steady rate of growth is essential for the health of a capitalist economic system, since it is only through growth that profits can be assured and the accumulation of capital be sustained' (1990, p. 180). In this respect, outer space is ideal: it is boundless and infinite. As Earth comes to be blanketed by capital, it is only to be expected that capital should set its sights on the stars above. The actions of capitalistkind serve to bolster the capitalist mode of production and accumulation: it is not only life but capital itself that must outlive Earth—even into the darkness of space.

#### Environmental degradation causes extinction.

Dr. Peter Kareiva 18, Ph.D. in Ecology and Applied Mathematics from Cornell University, Director of the Institute of the Environment and Sustainability at UCLA, Pritzker Distinguished Professor in Environment & Sustainability at UCLA, et al., September 2018, “Existential Risk Due To Ecosystem Collapse: Nature Strikes Back”, Futures, Volume 102, p. 39-50

In summary, six of the nine proposed planetary boundaries (phosphorous, nitrogen, biodiversity, land use, atmospheric aerosol loading, and chemical pollution) are unlikely to be associated with existential risks. They all correspond to a degraded environment, but in our assessment do not represent existential risks. However, the three remaining boundaries (climate change, global freshwater cycle, and ocean acidification) do pose existential risks. This is because of intrinsic positive feedback loops, substantial lag times between system change and experiencing the consequences of that change, and the fact these different boundaries interact with one another in ways that yield surprises. In addition, climate, freshwater, and ocean acidification are all directly connected to the provision of food and water, and shortages of food and water can create conflict and social unrest.

Climate change has a long history of disrupting civilizations and sometimes precipitating the collapse of cultures or mass emigrations (McMichael, 2017). For example, the 12th century drought in the North American Southwest is held responsible for the collapse of the Anasazi pueblo culture. More recently, the infamous potato famine of 1846–1849 and the large migration of Irish to the U.S. can be traced to a combination of factors, one of which was climate. Specifically, 1846 was an unusually warm and moist year in Ireland, providing the climatic conditions favorable to the fungus that caused the potato blight. As is so often the case, poor government had a role as well—as the British government forbade the import of grains from outside Britain (imports that could have helped to redress the ravaged potato yields).

Climate change intersects with freshwater resources because it is expected to exacerbate drought and water scarcity, as well as flooding. Climate change can even impair water quality because it is associated with heavy rains that overwhelm sewage treatment facilities, or because it results in higher concentrations of pollutants in groundwater as a result of enhanced evaporation and reduced groundwater recharge. Ample clean water is not a luxury—it is essential for human survival. Consequently, cities, regions and nations that lack clean freshwater are vulnerable to social disruption and disease.

Finally, ocean acidification is linked to climate change because it is driven by CO2 emissions just as global warming is. With close to 20% of the world’s protein coming from oceans (FAO, 2016), the potential for severe impacts due to acidification is obvious. Less obvious, but perhaps more insidious, is the interaction between climate change and the loss of oyster and coral reefs due to acidification. Acidification is known to interfere with oyster reef building and coral reefs. Climate change also increases storm frequency and severity. Coral reefs and oyster reefs provide protection from storm surge because they reduce wave energy (Spalding et al., 2014). If these reefs are lost due to acidification at the same time as storms become more severe and sea level rises, coastal communities will be exposed to unprecedented storm surge—and may be ravaged by recurrent storms.

A key feature of the risk associated with climate change is that mean annual temperature and mean annual rainfall are not the variables of interest. Rather it is extreme episodic events that place nations and entire regions of the world at risk. These extreme events are by definition “rare” (once every hundred years), and changes in their likelihood are challenging to detect because of their rarity, but are exactly the manifestations of climate change that we must get better at anticipating (Diffenbaugh et al., 2017). Society will have a hard time responding to shorter intervals between rare extreme events because in the lifespan of an individual human, a person might experience as few as two or three extreme events. How likely is it that you would notice a change in the interval between events that are separated by decades, especially given that the interval is not regular but varies stochastically? A concrete example of this dilemma can be found in the past and expected future changes in storm-related flooding of New York City. The highly disruptive flooding of New York City associated with Hurricane Sandy represented a flood height that occurred once every 500 years in the 18th century, and that occurs now once every 25 years, but is expected to occur once every 5 years by 2050 (Garner et al., 2017). This change in frequency of extreme floods has profound implications for the measures New York City should take to protect its infrastructure and its population, yet because of the stochastic nature of such events, this shift in flood frequency is an elevated risk that will go unnoticed by most people.

4. The combination of positive feedback loops and societal inertia is fertile ground for global environmental catastrophes.

Humans are remarkably ingenious, and have adapted to crises throughout their history. Our doom has been repeatedly predicted, only to be averted by innovation (Ridley, 2011). However, the many stories of human ingenuity successfully addressing existential risks such as global famine or extreme air pollution represent environmental challenges that are largely linear, have immediate consequences, and operate without positive feedbacks. For example, the fact that food is in short supply does not increase the rate at which humans consume food—thereby increasing the shortage. Similarly, massive air pollution episodes such as the London fog of 1952 that killed 12,000 people did not make future air pollution events more likely. In fact it was just the opposite—the London fog sent such a clear message that Britain quickly enacted pollution control measures (Stradling, 2016). Food shortages, air pollution, water pollution, etc. send immediate signals to society of harm, which then trigger a negative feedback of society seeking to reduce the harm.

In contrast, today’s great environmental crisis of climate change may cause some harm but there are generally long time delays between rising CO2 concentrations and damage to humans. The consequence of these delays are an absence of urgency; thus although 70% of Americans believe global warming is happening, only 40% think it will harm them (http://climatecommunication.yale.edu/visualizations-data/ycom-us-2016/). Secondly, unlike past environmental challenges, the Earth’s climate system is rife with positive feedback loops. In particular, as CO2 increases and the climate warms, that very warming can cause more CO2 release which further increases global warming, and then more CO2, and so on. Table 2 summarizes the best documented positive feedback loops for the Earth’s climate system. These feedbacks can be neatly categorized into carbon cycle, biogeochemical, biogeophysical, cloud, ice-albedo, and water vapor feedbacks. As important as it is to understand these feedbacks individually, it is even more essential to study the interactive nature of these feedbacks. Modeling studies show that when interactions among feedback loops are included, uncertainty increases dramatically and there is a heightened potential for perturbations to be magnified (e.g., Cox, Betts, Jones, Spall, & Totterdell, 2000; Hajima, Tachiiri, Ito, & Kawamiya, 2014; Knutti & Rugenstein, 2015; Rosenfeld, Sherwood, Wood, & Donner, 2014). This produces a wide range of future scenarios.

Positive feedbacks in the carbon cycle involves the enhancement of future carbon contributions to the atmosphere due to some initial increase in atmospheric CO2. This happens because as CO2 accumulates, it reduces the efficiency in which oceans and terrestrial ecosystems sequester carbon, which in return feeds back to exacerbate climate change (Friedlingstein et al., 2001). Warming can also increase the rate at which organic matter decays and carbon is released into the atmosphere, thereby causing more warming (Melillo et al., 2017). Increases in food shortages and lack of water is also of major concern when biogeophysical feedback mechanisms perpetuate drought conditions. The underlying mechanism here is that losses in vegetation increases the surface albedo, which suppresses rainfall, and thus enhances future vegetation loss and more suppression of rainfall—thereby initiating or prolonging a drought (Chamey, Stone, & Quirk, 1975). To top it off, overgrazing depletes the soil, leading to augmented vegetation loss (Anderies, Janssen, & Walker, 2002).

Climate change often also increases the risk of forest fires, as a result of higher temperatures and persistent drought conditions. The expectation is that forest fires will become more frequent and severe with climate warming and drought (Scholze, Knorr, Arnell, & Prentice, 2006), a trend for which we have already seen evidence (Allen et al., 2010). Tragically, the increased severity and risk of Southern California wildfires recently predicted by climate scientists (Jin et al., 2015), was realized in December 2017, with the largest fire in the history of California (the “Thomas fire” that burned 282,000 acres, https://www.vox.com/2017/12/27/16822180/thomas-fire-california-largest-wildfire). This catastrophic fire embodies the sorts of positive feedbacks and interacting factors that could catch humanity off-guard and produce a true apocalyptic event.

### 1AC – Plan

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

#### The plan treats outer space as a commons, a shared public good. That’s the only effective anti-trust measure to safeguard and promote innovation. Rhimbassen 21

Maria Rhimbassen, 6-6-2021, "An Introduction to Space Antitrust," Open Lunar, https://www.openlunar.org/library/an-introduction-to-space-antitrust#anti-monopoly-law

Space Antitrust. The extrapolation of anti-monopoly law to outer space (e.g., on orbit, on celestial bodies, etc.), raises the question as to which jurisdiction applies. In theory, the launching State’s jurisdiction extends to the launched space object, in perpetuity, such as in the case of the International Space Station’s modules. However, in many cases, there can be confusion in determining the “launching State”, which is defined at article I of the Liability Convention of 1972 (70), especially when several States are involved in the launching, as opposed to the “State of Registry”, according to article VIII of the OST and the Registration Convention of 1976. Sometimes, the two notions collide head-on (71). The situation gains in further legal complexity in connection with on-orbit transfer of ownership vs title. It is not clear whether ownership can be fully transferred in orbit, as opposed to title, which does not. This may prove over-complicated indeed. Therefore, it would be next to impossible to assign or attribute antitrust to a specific jurisdiction in space and that explains the need for a harmonized outer space regime in terms of antitrust, even more when the principles addressed supra stem from international public law. Otherwise, different antitrust regimes would then apply to different sites of activity by different actors, which could end up in aberrant scenarios. It would be more convenient to establish a predictable and harmonious legal certainty, appropriate for each resource system or specific application in outer space and to consider antitrust as a creative tool, not an end in itself. The rationale is to rely on competition law to ensure market sustainability, while reducing the risk of fierce and unfair competition. For instance, in the case of scarce resources (e.g., polar ice water on the Moon), essential services (e.g., oxygen supply on a station, etc.), there is a need for measures against reckless monopolization based on a “first come, first served” logic. As mentioned supra, due regard and non-harmful interference may be used in that sense, but implementation remains to be established. Should that be brought to public international bodies, in the form of binding measures or non-binding guidelines? Should recommendations be made at the national level (e.g., model law clauses (72) to be inserted as amendments to national space legislation? Without harmonization efforts at that level, there is a risk of increasing forum shopping whereby a private actor seeks to register its activities in jurisdictions with less stringent legislation and dubious enforcement resources. This trend starts in the space sector and this is alarming since space is a high risk sector and launching States’ international liability is a complex notion in terms of attribution, especially if the damage takes place in orbit which explains why some private entities either choose a complex forum architecture, mostly through contractual law (73), or try to escape any national jurisdiction altogether by launching from international waters (74), which is considered as yet another example of legal void and deserves more consideration.**‍** The How. The previous sections addressed the “what” or more precisely, the space market through the lens of fair competition and antitrust. However, determining the “how” is more challenging. Indeed, as mentioned, sources of a space antitrust could either originate in future initiatives at the level of hard law or could be left to the realm of soft law and self-regulation. The former surpasses the latter in terms of legitimacy, but might be very time-consuming (75), if reaching consensus at all. The latter might not sit well with the space community at large, but might prove more efficient and timelier, which is needed especially when space commerce beckons. To come to grips with the implementation conundrum, this section draws from the legal field of intellectual property, which is considered, according to the Organisation on Economic Cooperation and Development (OECD) (76), as a part of competition law because of its monopolistic potential. Intellectual property has its share of controversy in terms of knowledge enclosure and excludability of knowledge commons (77), thus arguably reducing the advancement of innovation to the status of stagnation and limiting the diversity of knowledge itself (78). Intellectual property (IP) rights, as any aspects of property law, rely on a State’s jurisdiction. However, when transformed into financial assets, these intangible assets can eventually escape that given jurisdiction (79). Furthermore, as IP increasingly interacts with antitrust (80), it is interesting to note here the junction between property rights, IP, finance, antitrust and space. Through IP, antitrust could find yet another way to escape national legislation and incentivize the growth, at the same time, of a space financial market. In this situation, the content of IP could be space resources per se, however modified somehow in order to qualify for either a patent or trade secrets and translated into financial assets. They could then benefit from innovative and decentralized archiving through technology such as blockchain -- although “consortium blockchains” (81) might raise collusion or concerted practices issues, which qualify as "unfair competition” and enter the realm of smart contracts, which are self-executory by default (82), and increase transparency, while escaping a whole lot of jurisdiction. They could even become a source of space commodities in the case of an eventual space commodities exchange (83). Such opportunity for decentralized governance can perhaps be managed at best through polycentricity, which is based on Ostrom’s matrix of goods (84) trying to solve issues around the “commons” and their respective rights (85). This might prove essential as IP carries an inherent risk of monopolization. In this scenario, entire resource systems, altered to qualify as IP, can be monopolized by a few private entities, which could end up restricting significantly the capacity and diversity of space commerce in the future. Since this kind of assets would fall under the fifth basket of commodities (86), namely financial rights, and in this case, derivatives, it would be trickier to determine the applicable law because of increasing deregulation. Furthermore, this problem is exacerbated by decentralized cyber technology such as blockchain. Hence the bigger problem of identifying the appropriate source of law to intervene in this transnational occurrence. Having touched on the pros and cons of hard and soft law, supra, the observation which could be made in this section is that soft law, building on the trend of privatization of the law, could seize this opportunity to play an active role through different instruments such as compliance requirements, contractual clauses, or ethical principles, which often precede law chronologically (87). These private sources of law, and perhaps soon enough public sources too, stem from a potential business model involving platforms that manage decentralized blockchain systems housing the code of financial assets derived from space resources IP -- and arguably creating thus new property rights “from scratch” (88). These platforms could make sure that no set of coded resource systems take over and monopolize the market and enforce their own rules and smart contracts over others (89). Such purpose focused on fair competition could be orchestrated inside a given community of interest (90) and rely on an external entity (oracle form to be determined) for guidance with respect to perpetuating the protection of the given purpose (91). That could take the form of a trust (92) and contribute to laying the foundations for future sustainable customary practice, norms, or behavior. Such trust might indeed address antitrust on the level of the “what” (fair competition and resource systems) and the “how” (fair competition in terms of platforms, i.e., preventing monopolization of one or several blockchains through initial allocations) by enforcing principles such as open access and transparency.

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