# AC

#### Since, in a just world, outer space would be treated as a global commons, and a global commons model precludes appropriation by private entries, then the appropriation of outer space by private entries is unjust.

#### Thus, the plan: States ought to adopt a binding international agreement that bans the appropriation of outer space by private entities by establishing outer space as a global commons subject to regulatory delimiting and global liability.

#### The aff:

#### solves debris and space colonialism by ensuring the sustainable and equitable use of outer space resources.

* prevents circumvention by aligning the interests of state parties
* is normal means since it models numerous successful agreements governing all other global commons.

Vollmer 20 [Sarah Louise Vollmer (St. Mary's University School of Law), “The Right Stuff in Geospace: Using Mutual Coercion to Avoid an Inevitable Prison for Humanity,” 51 ST. MARY'S L.J. 777 (2020). <https://commons.stmarytx.edu/thestmaryslawjournal/vol51/iss3/6?utm\_source=commons.stmarytx.edu%2Fthestmaryslawjournal%2Fvol51%2Fiss3%2F6&utm\_medium=PDF&utm\_campaign=PDFCoverPages> ]CT

IV. NECESSITY FOR REGULATION TO PRESERVE THE HERITAGE OF MANKIND—A PROPOSAL

Conceptually, all persons hold an implied property right in the space commons.111 As such, spacefaring entities and developing nations possess an equitable right to access and use orbital resources.112 But the sui generis nature of geospace presents a paradox requiring a unique regime for the sustainable usage of its resources.113 The international community cannot realize the advantages of the common heritage principle under a property regime because any conceivable assignment would violate the non-appropriation clause or unjustly enrich a particular interest.114 This means that only regulatory solutions can protect the interests inherent in a commons protected for the common heritage of mankind.

A. The Motivations for International Compliance

The crux of a workable treaty lies in the consent of the parties to the agreement.115 Thereafter, signatories internalize the agreement’s object and purpose into their domestic law, or in the case of international organizations, into an institutional framework.116 To implement a binding international instrument, we must therefore ask the question: Why do nations follow international law,117 and how can we use those behavioral realities to construct a workable framework to ensure geospace survives?118

At the dawn of civilized society, depending on a particular jurisdiction’s values, the laws of nature and morality compelled obedience and social order.119 When nation-states concluded international agreements, it represented the coalescence of the various values-based systems, the overlap of which formed a universal understanding of the law of mankind.120 “[The] fundamental conceptual boundary between municipal and international law . . . view[s] international law largely in terms of contractual relations, therefore assigning to the ‘sovereign’ a central place in the construction of the two orders.”121 In other words, transnational cooperation operated through balancing the competing autonomy and values of the parties involved. Despite centuries of debate, values systems remain the principal motivating factor of compliance with international law.122 Effective regulatory regimes must, therefore, strike at the heart of what nation-states value the most, which is often related to national security.123

When entering an international agreement, whether or not a nation-state will ratify it informs us of the value a nation-state places on the instrument’s subject matter. That value equates to the utility a nation-state places on certain allowances or prohibitions.124 Incorporating these motivating factors with Hardin’s regulatory solution, any freedoms infringed upon must manifest a higher utility than currently realized. If COPUOS proposes a protocol for sustainable uses of space, the provisions must either have a negligible effect on the global community’s perceived utility of space access or substantially increase that utility. Assuming the propositioned regulatory scheme aligns with the values system of each nation-state, the probability of internalizing such regulations through domestic codification is high.

To ascertain the interests of nation-states, we must look to the factors motivating current space utilization. Routine access to space undeniably aids our technological advancement. The ISS’s antigravity environment provides unique conditions to study medicine.125 Satellites provide real-time tracking of environmental conditions and transmit crucial information for disaster recovery planning.126 Space telescopes track objects with the potential to cause the extinction of life of Earth.127 Free from the veil of our hazy atmosphere, satellites can produce better imagery and ascertain the composition of potential resource deposits on celestial bodies.128 And simply receiving satellite imagery of our planet forces us to confront the realities of our fragile existence. These benefits signify the tangible realization of the OST’s object and purpose, which flow to all members of the global community.129 If we do not begin active decontamination and mitigation of space debris, the utility of geospace will cease to exist. Imagining our existence without these advances is a potent method to stress the criticality of unabated pollution in geospace.

B. Existing Proposals

Legal scholars have formulated several frameworks to mitigate space debris. Some recommend implementing a market-share liability regime, which assigns liability according to the volume of each nation-states’ exploits.130 Opponents of this construction rightfully highlight the inequities inherent in such a scheme. Considering the United States, Russia, and China make up the bulk of spacefaring activity, market-share liability would unduly burden these nations, and coerce a categorical exit from the space industry or a repeat of the Moon Treaty.131 Another scholar advocates for an environmental law approach, asserting that the space commons would benefit from a protocol closely mirroring the Madrid Protocol.132 While prospective applications of such a model could prevent additional accumulations, it would not feasibly abate the current collection of debris.133 The strengths of Mary Button’s mitigation proposal lie in the binding nature of the Madrid Protocol and compulsory environmental impact requirements. And though it advocates for a more collaborative conference mechanism, rather than the strict unanimous consent required of UNCOPUOS’s resolutions, it still shies away from compulsory requirements for active debris removal. Along with the Antarctic Treaty (ATS), the Law of the Sea (UNCLOS) also served as a model for the Corpus Juris Spatialis. But oddly, the law of salvage was omitted from the treaties. Unlike abandoned objects at sea, once a nation-state places an object into space, ownership exists in perpetuity. Sandra Drago addressed removing the OST’s property-in-perpetuity mechanism134 so as to permit the active salvage of inoperable satellites.135 Drago’s proposal is vital to any mitigation framework. But while this removes a substantial bar currently restricting debris removal, it does not address free-riding, and spacefaring enterprises are free to choose more lucrative space activities other than salvage operations.136

C. A Coercive Proposal

Mutual coercion lies at the core of Hardin’s solution.137 To summarize, law-abiding citizens make concessions to regulatory social constructs in the interest of conserving some utility otherwise lost.138 The coercive element lies in relinquishing one’s ability to exploit some freedom, the detriment of which cannot be realized at that moment in time.139 Conceding to a regime that tempers free exploitation of the commons allows everyone to benefit from the positive externalities of individual usage. Equated to space, nation-states currently concede to non-appropriation in the interest of maintaining equitable access. But because of the sui generis nature of geospace, even non-participants receive a benefit from the use of the commons. In effect, beneficiaries are free-riding from the capital investment of spacefaring nations and entities. This informs the structure of the ensuing two-part framework: geospace delimitation and global liability

1. Geospace Delimitation

The history of regulatory delimitation illustrates its effectiveness at balancing the rights of individuals, sovereigns, and mankind. Each instance explained in Part II infra, arose out of public necessity to ensure and protect the maximum utility of the global commons, without the deleteriousness of inhabitability, sovereign interference, or over-exploitation.140 The regimes governing Antarctica, the High Seas, the Atmosphere, and the radio-frequency spectrum evidence that mutually coercive delimitation can honor the common heritage of mankind, without encroaching on the peaceful enjoyment and benefits attributable to these areas.

a. Antarctica

In the 1950s, there was concern that Antarctica would succumb to Cold War hysteria, becoming a target for international discord and nuclear arms testing.141 In a move to reestablish global scientific exchange, the international scientific community hosted the International Geophysical Year project, and after identifying the potential of Antarctica, sought to protect it from any ruinous power posturing.142 This necessity for regulating permissible activity resulted in the formation of the ATS.143 Subsequent technological advancement revealed mineral deposits, triggering commercial interest in exploiting its natural resources. The threat catalyzed the promulgation of the Madrid Protocol.144 Again, these delimitations did not sever humanity’s utility in Antarctica. Rather, mankind conceded to the prohibition of deleterious usage in the interest of preserving its scientific utility.145

b. The High Seas

Similar to Antarctica, the High Seas faced threats in the 1960s when nation-states began unilaterally and arbitrarily, extending resource recovery activities further into the depths of international waters.146 In the interest of equity, particularly the interests of landlocked nations, UNCLOS delimited sovereign access to the seas, allowing usage only within the established exclusive economic zones (EEZs).147 An annex to UNCLOS provided a procedural framework in which resource recovery enterprises could operate in international common areas beyond the EEZs, precluding the unilateral capture of global resources by one nation.148 Once more, a mutually coercive framework removed certain freedoms in the interest of mankind without unjustly limiting equitable access to resources.

c. The Atmosphere

Divergent from the problems of the ice and sea, atmospheric regulation resolved an issue more analogous to geospace debris proliferation. Atmospheric utility is quite simple: breathable air and protection from deadly cosmic radiation. When satellite imagery revealed the sizable hole in the ozone layer, the Montreal Protocol to the Vienna Convention placed an outright ban on ozone-depleting chemicals in everyday consumables.149 This prohibition directly addressed the source of the negative externality, forcing humanity to internalize the externality through alternate investment in refrigerants. Recent evidence of the reduction of ozone loss validates the mutually coercive delimitation within the Montreal Protocol.150

d. Regulating the Telecommunication Spectrum

The business model and financial strategy of telecommunications entities influence satellite deployment planning. Typically, orbital placement aims to “maximize [a] potential user base,” and if that base happens to encompass, for instance, the continental United States, market competition drastically narrows the availability of slots for satellite positioning.151 Realizing that satellite acquisition becomes moot without conscientious “use of telemetry and control . . . required for spaceflight,”152 the Space Radiocommunication Conference convened to revise the Radio Regulations in 1963,153 granting the ITU authority to allocate radio frequencies among spacefaring entities.154 Originally, the ITU:

[A]llocated orbits and frequencies solely through a first-in-time system. This led to concern that developed countries would secure all of the available slots before developing countries had the technological capacity to use them. Although some orbits and frequencies are still allocated on a first-in-time basis, each state is now guaranteed a certain number of future orbits and frequencies, regardless of its current technological capacity.155

The FCC regulates the segment of the electromagnetic spectrum allocated to the United States.156 Arguably, the ITU and agencies like the FCC engage in de facto appropriation of the more highly sought-after orbits.157 Yet to an extent, the ITU’s delimiting of the radio-frequency spectrum remedied the negative externalities of non-appropriation in geospace, such as the overcrowding of active satellites and the resultant interference. Where the ITU’s scheme does not remedy the byproduct of geospace resource use, it succeeds in ensuring communication capabilities remain free from inequitable use.158

e. The OST’s Ineffective Delimitations

The recurrent theme among the aforementioned regulatory schemes is the preservation of utility within the commons concerned.159 The frameworks each provide a means to enjoy shared resources while removing the potential for destruction. The OST’s nonproliferation provisions properly regulate the usage of the space commons to further the enjoyment of space’s true utility: scientific discovery and telecommunications. Likewise, the Liability Convention reinforces the necessity to maintain heightened situational awareness to guarantee the mutual, uninterrupted enjoyment of activity in space.160 But nation-states exploit the loop-holes within these documents to avoid internalizing some of their externalities. Specifically, the Liability Convention only assigns liability for damage caused to space objects when fault can actually be determined.161 Though it would be simple to assign fault to a collision caused by an intact and inoperative satellite, it is virtually impossible to identify the owner of smaller pieces of debris. Further, while the ITU reserves slots for nations not represented in space,162 it does nothing to stop those capable of reaching geospace from littering the commons and destroying the utility of reserved slots.163 Holistically, none of the delimitations in the Corpus Juris Spatialis negate the cause of the growing belt of debris in geospace.

As a sui generis resource, the mere occupation of LEO or GSO equates to the reduction of the overall utility of geospace. When an entity launches a rocket into space, the accompanying payload causes either (1) temporary reduction of the aggregate utility of geospace or (2) permanent reduction of the aggregate utility of geospace.164

The first delimitation prong will recommend bifurcating the applicability of the Corpus Juris Spatialis, with separate regimes for outer space and geospace. While the commercialization of outer space is not overly injurious to the international commons or interests of developing nations, the overcrowding of affluent spacefaring entities vying for orbital acquisition puts immense pressure on the finite resources within geospace. Therefore, demarcating the upper limit of geospace will allow entities to continue exploring the universe without imposing the restrictions placed on those seeking geospace positioning.165 This modification will allow continued use of both regions, but coerce more sustainable usage of geospace with the assistance of the secondary prong below.

2. Global Liability

Operating under the theory that humanity holds an implied property right in the global commons but limited under the non-appropriation clause to protect those interests through traditional property mechanisms, the logical alternative is to impose liability on actions violative of the global interest.166 Further, assuming humanity collectively benefits from utilization of this commons, then humanity likewise must internalize the cost of the negative externalities imposed.167 This means that spacefarers, as members of the global collective, hold both the right and obligation to protect that right for others.168 Therefore, anyone utilizing or benefitting from the utilization of the geospace commons has an equitable duty to ensure its sustainability. Under traditional tort theories, when one has a duty, breach of that duty causally linked to a measurable injury is actionable. In terms of the duty to humanity when utilizing geospace, the culmination of Kessler Syndrome represents the measurable injury.

Kessler informed the scientific community in 1970 of the probable cataclysmic chain-reaction and destructive conclusion of unabated geospace debris pollution.169 This theory, reiterated consistently since its dissemination, materialized in 2009.170 Fundamentally, every spacefaring entity and approving launching state knows of this monumental threat to the utility of geospace. Yet to date, mitigation guidelines remain non-binding, and four-figure satellite constellations continue to receive approval.171 To incorporate a time-honored risk calculation method, the Hand Formula is instructive and evidences a trend toward unapologetic endangerment to the utility of geospace in isolation of the associated tort regime.

Let us assume the burden to mitigate space debris is $18.5 million172 but the probable magnitude of not mitigating the accumulation of space debris equates to reverting our technological capabilities back to the 1800s. Considering the accumulation of debris from the accidental or intentional breakup of geospace satellites, the probability of Kessler Syndrome fully concluding in the absence of a comprehensive mitigation protocol is one hundred percent.173 While difficult to quantify, the value of our scientific progress attributable to the advent of space travel far outstrips the burden to mitigate space debris. Should Kessler Syndrome become our reality, the measurable injury is the cost of reestablishing global communications without the usage of satellite relays. To add insult to injury, the invaluable utility of geospace will cease to exist.

A viable alternative would institute a regime of shared global liability which makes consideration of capital investors as well as nonparticipating beneficiaries in the interest of equity. That is, should the inevitable prison for humanity become a reality, the entire global community will be liable to pay an equitable share of the overall cost of recovery efforts.174 The Liability Convention should undergo a similar trifurcation, adding this new scheme to the current strict and absolute liability mechanisms.175 As such, shared global liability will consider the responsibility of nation-states and private entities in isolation.176 This will coerce cooperation among all agencies, nations, and private entities because the equitable share of responsibility will drive collective resolution.

V. CONCLUSION

In light of the emerging global sentiments regarding environmental conservation and sustainability, instituting a regime that clearly defines a legal consequence in the event of environmental ruin boasts greater coercive force than non-binding resolutions. 9 This international agreement aligns with the universal value that the international community places on the utility of geospace.177 In essence, it protects geospace by forcing the signatory to face the reality of their negative externalities. It is unlikely that a nation-state exists that does not value space exploration and the benefits attributable.

In April of 2019, in the spirit of the Sustainable Development Goals (SDGs), COPUOS adopted an agenda that focused on the long-term sustainability of the space commons, space traffic management, equitable uses of GSO, and the mitigation of space debris.178 Mindful of space’s critical role in attaining many of the SDGs, the Committee put forth guidelines to facilitate capacity building without prejudice to any one nation-states’ economic capabilities. To be sure, the Guidelines for the Long-Term Sustainability of Outer Space Activities are an important step forward, but many delegates reiterated the importance of developing binding instruments, particularly in light of developments in “space resource exploitation, large constellations, and space debris remediation.”179

Looking forward, research continues to advance the availability of debris mitigation mechanisms, such as the European Space Agency’s newly-commissioned ClearSpace-1 satellite.180 Mission objectives increasingly include end-of-life procedures to place satellites in appropriate orbits to decrease clutter in areas where active satellites operate.181 In the context of private entities, Planetary Resources—originally positioned to become a principle player in the space mining industry—merged with Consensys Space and quickly launched TruSat, a crowd-sourced situational awareness forum that compiles the reports of private citizens to track objects in geospace.182 These developments instill confidence in the international community’s sentiments toward ameliorating this ever-approaching catastrophe. It is with great hope that this trend continues, and COPUOS promulgates binding regulations to ensure the sustainability of geospace for the common heritage of mankind. “But we can never do nothing. That which we have done for thousands of years is also action. It also produces evils.”183

#### Treating space as a commons solves orbital debris. Current non-binding agreements are not enough.

Silverstein & Panda ‘3/9 - Benjamin Silverstein [research analyst for the Space Project at the Carnegie Endowment for International Peace. MA, International Relations, Syracuse University Maxwell School of Citizenship and Public Affairs BA, International Affairs, George Washington University] and Ankit Panda [Stanton Senior Fellow in the Nuclear Policy Program at the Carnegie Endowment for International Peace. AB, Princeton University], “Space Is a Great Commons. It’s Time to Treat It as Such.” *Carnegie Endowment for International Peace* (Web). March 9, 2021. Accessed Dec. 13, 2021. <<https://carnegieendowment.org/2021/03/09/space-is-great-commons.-it-s-time-to-treat-it-as-such-pub-84018>> AT

The failure to manage Earth orbits as a commons undermines safety and predictability, exposing space operators to growing risks such as collisions with other satellites and debris. The long-standing debris problem has been building for decades and demands an international solution.¶ Competing states need to coalesce behind a commons-based understanding of Earth orbits to set the table for a governance system to organize space traffic and address rampant debris. New leadership in the United States can spur progress on space governance by affirming that Earth orbits are a great commons. So far, President Joe Biden and his administration have focused on major space projects, but a relatively simple policy declaration that frames Earth orbits as a great commons can support efforts to negotiate space governance models for issues like debris mitigation and remediation. The Biden administration can set the stage to pursue broad space policy goals by establishing a consensus among states, particularly those with the most invested in Earth orbits, that space is a great commons.¶ THE PRESSING NEED FOR SPACE GOVERNANCE¶ The Earth orbits that provide the majority of benefits to states and commercial ventures represent only a tiny fraction of outer space as a whole. Competition for the limited volume of these Earth orbits is especially fierce since two satellites cannot be in the same place at the same time and not all orbits are equally useful for all missions. The number of objects residing in Earth orbits is now at an all-time high, with most new objects introduced into orbits at altitudes of between 400 and 700 kilometers above sea level. Millions of pieces of debris in Earth orbits pose a threat to continuing space operations. For instance, the final U.S. space shuttle missions faced 1-in-300 odds of losing a space vehicle or crew member to orbital debris or micrometeoroid impacts.¶ Collisions with fragments of orbital litter as small as a few millimeters across can ruin satellites and end missions. Current technologies cannot track all of these tiny pieces of debris, leaving space assets at the mercy of undetectable, untraceable, and unpredictable pieces of space junk. Some researchers have determined that the debris population in low Earth orbit is already self-sustaining, meaning that collisions between space objects will produce debris more rapidly than natural forces, like atmospheric drag, can remove it from orbit.¶ States—namely the United States, Russia, China, and India—have exacerbated this debris accumulation trend by testing kinetic anti-satellite capabilities or otherwise purposefully fragmenting their satellites in orbit. These states, along with the rest of the multilateral disarmament community, are currently at an impasse on establishing future space governance mechanisms that can address the debris issue. A portion of this impasse may be attributable to disparate views of the nature of outer space in the international context. Establishing a clear view among negotiating parties that Earth orbits should be treated as a great commons would establish a basis for future agreements that reduce debris-related risks.¶ Beyond debris-generating, kinetic anti-satellite weapons tests, revolutionary operating concepts challenge existing space traffic management practices. For instance, commercial ventures are planning networks of thousands of satellites to provide low-latency connectivity on Earth and deploying them by the dozens. States are following this trend. Some are considering transitioning away from using single (or few) exquisite assets in higher orbits and toward using many satellites in low Earth orbits. These new operational concepts could lead to an increase in collision risks.¶ Without new governance agreements, problems related to debris, heavy orbital traffic, and harmful interference will only intensify. Debris in higher orbits can persist for a century or more. The costs of adapting to increasingly polluted orbits would be immense, and the opportunity costs would be even higher. For instance, all else being equal, hardening satellites against collisions increases their mass and volume, in turn raising launch costs per satellite. These costs, rooted in a failure to govern space as a commons, will be borne by all space actors, including emerging states and commercial entities.¶ EXISTING FORMS OF SPACE GOVERNANCE¶ A well-designed governance system, founded on a widespread understanding of Earth orbits as a great commons, could temper these risks. Currently, space is not wholly unregulated, but existing regulations are limited both in scope and implementation. Many operators pledge to follow national regulations and international guidelines, but decentralized accountability mechanisms limit enforcement. These guidelines also do not cover the full range of potentially risky behaviors in space. For example, while some space operators can maneuver satellites to avoid collisions, there are no compulsory rules or standards on who has the right of way.¶ At the interstate level, seminal multilateral agreements provide some more narrow guidance on what is and is not acceptable in space. Most famously, the Outer Space Treaty affirms that outer space “shall be free for exploration and use by all states without discrimination of any kind” and that “there shall be free access to all areas of celestial bodies.” Similar concepts of Earth orbits being a great commons arise in subsequent international texts. Agreements like the Liability Convention impose fault-based liability for debris-related collisions in space, but it is difficult to prove fault in this regime in part because satellite owners and operators have yet to codify a standard of care in space, and thus the regime does not clearly disincentivize debris creation in orbit. Other rules of behavior in Earth orbits have been more successful in reducing harmful interference between satellite operations, but even these efforts are limited in scope.¶ States have acceded to supranational regulations of the most limited (and thus most valuable) Earth orbits. The International Telecommunication Union (ITU) coordinates, but does not authorize, satellite deployments and operations in geosynchronous orbits and manages radiofrequency spectrum assignments in other regions of space to reduce interference between satellites. These coordination activities are underpinned by the ITU’s constitution, which reminds states “that radio frequencies and any associate orbits . . . are limited natural resources,” indicating a commons-based approach to governing the radiofrequency spectrum. However, the union’s processes are still adapting to new operational realities in low Earth orbit, and these rules were never designed to address issues like debris.

#### Current law governing space bans state appropriation, BUT ALLOWS private appropriation. A true global commons regime would require a form of democratic governance that ensures the equitable use of space resources and overcomes the expansion of neoliberal capitalism into outer space.

Dardot 18 [Pierre Dardot, “What democracy for the global commons?,” The Commons and a New Global Governance, ed. Samuel Cogolati and Jan Wouters (2018). <https://d1wqtxts1xzle7.cloudfront.net/58613276/What_Democracy_-_Dardot_Leuwen_2018.pdf?1552469271=&response-content-disposition=inline%3B+filename%3DWhat_democracy_for_the_global_commons.pdf&Expires=1642726034&Signature=YJi8AG6~Y---mP0qsop4i3t~Z5bVLtQYwuDtUdXm6sdKaYwCJFFzQOL-OiY9nIH~JZsophnChwMlUMSGOCDVh7NhHmUonD28k9fU9PrfN2nYTNV2x8XnvoK2KtelSRvRyWN78eA7uC1isTAf1pO5~abPS9XQnORhjp9nPXjpIuBqLrrJhIUCKNjEorJ0u1h63DxkORBKVZfFh-TawG~PS~WdamGNqfljxjaP1G5bG-hUh1aNw0CuXhnqdd8yeH0-uT7iXVNu8cDl2zOtobIiAmD0SBKxjUXP8SYLkvNO0BETnpIzetK7gW8yksHtYjt-WasarhkMQpHeNwvJOY8QeA__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA>] CT

Using ‘commons’ as a noun, thus, implies a methodological break with this reification of common things, as well as with the logic underlying the classification of goods in economic theory. A ‘commons’ is first and foremost an institutional affair and, more specifically, an institutional space defined by collectively developed practical rules. What is most important is the dimension of instituting the activity, and not the technical characteristics of things and goods. Here lies the essential difference between common goods and the common(s). We must specify, therefore, that any commons, insofar as it is instituted as such, is a good in an ethical and political sense. By contrast, any good that is capable of being purchased and sold, is not in itself a commons. This means that a commons is a good only under the condition that it is not a possession or an acquisition. In other words, once it is instituted, a commons is inalienable and inappropriable. It creates a space within which use prevails over ownership. It is, thus, not a resource in itself – even when it is related to one. In this way we understand a commons to be the active link between an object, a place, a natural resource (for example, a waterfall or a forest), or something artificial (for example, a theatre or a square) and the collective activity of those who take charge of it, preserve it, maintain it and take care of it. This activity is not external to the commons, but instead inherent in it.

If we take this to be the definition of every common, then a third implication is that a common, regardless of its specific designation, requires self-government or democratic government. The very act of establishing a common is in and of itself a democratic act. The act of governing a common is nothing more than the continuation of the democratic act; it is thus a sort of continuation of the institution. It consists of reviving this institution by critically assessing its collective rules, whenever the situation demands it. As such, the governance of the common can only proceed from the principle of democracy – the non-democratic governance of a common would threaten, in the short-term, the very existence of this common. I call this the principle of the common, this time in the singular form. For that purpose, I refer to the Latin etymology of this word: the common, or ‘cum-munus’, is the co-obligation that results from co-participation in the same activity. This co-obligation cannot proceed from the simple fact of belonging. Democracy is, in essence, co-participation in public affairs. The Occupy movement (for example, the anti-austerity movement in Spain, also referred to as the 15-M Movement or the Indignados, or the wave of protests in 2013 to contest the urban development plan for Istanbul’s Gezi Park) brought with it a strong anti-oligarchic critique of contemporary political representation, advocating for ‘real democracy’. Most notable is that this democratic requirement is strongly tied to ecological claims based on preserving the ‘commons’ (urban spaces in particular) against any sort of private or state enclosure. It then becomes evident that the commons (in the plural) cannot but be established or governed but by the implementation of the principle of the common (in the singular), which is to say, democracy. To sum up, common use requires self-government.

Yet these examples would seem to speak in favour of the establishment of a local democracy, confined within specific geographic limits (for example, a neighbourhood or a city). Aristotle argued for a similar sort of constraint, pointing that beyond a certain number, citizens could no longer know each other. This capacity to mutually engage with one another was, according to him, an important condition for the exercise of democracy. Thus emerges a challenge I will here try to tackle: what sort of democracy is required for commons which are not local, but global in nature – global commons? My thesis is that this democracy can only be global. It remains to be seen what this sort of global democracy should look like.

CURRENT PARADIGMS TO DEAL WITH THE UNLIMITED COSMOCAPITALISM

With neoliberal capitalism we have come to know a singular historical phenomenon, which I will refer to as ‘cosmocapitalism’. How can this be understood? Cosmocapitalism is not merely a geographical or spatial extension of capitalism, since this extension appeared along with the birth of capitalism. It represents capitalism’s tendency to become universal. By this, I mean that capital tends to submit all aspects of human existence, even those most intimate and subjective, along with the natural world, to the market’s logic, which is nothing more than the logic of competition. The terms ‘world’ and ‘cosmos’ do not describe the planet in a physical sense, or even the global population, but rather the political framework, with its institutional and normative qualities whereby the expansion of the market’s logic becomes possible. Max Weber already described the idea of an immense cosmos which imposes its economic activity on the individual caught within the market’s grasp (Weber, 2002). Today, this cosmos has grown beyond the single economic sphere to include the social sphere.

3.1 Humanity’s Common Heritage Paradigm and the Appropriation of Space

A first example will allow us to highlight this logic of limitlessness by examining the delegation of tasks between the state and private enterprises. On 25 November 2015, just a few days before the opening of the 21st Conference of the Parties (COP) of the Framework Convention on Climate Change in Paris, Barack Obama passed law H.R.2262, which provided authorization for private American companies to use natural resources from outer space (US Congress, 2015).

As we know, the 1967 Outer Space Treaty established the legal status of outer space in the following manner (United Nations, 1967). Article 1 acknowledged that the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries, implying free and equal access without discrimination of any kind. Article 2 established that ‘Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means’. These two conditions, equal access for all and non-ownership, are strictly complementary and both refer to subjects recognized by international law, that is to say, the states: ‘national appropriation’ is state ownership and non-appropriation refers to non-appropriation by states only.

It is precisely from this ambiguity that the law (US Congress, 2015) was cleverly enacted on 25 November 2015. Its name is already quite self-evident: US Commercial Space Launch Competitiveness Act. In a nutshell, the Act gives any United States (US) citizen involved in commercial exploration and exploitation of an asteroid or space resource, the right to own, possess, transport, use, and sell this resource provided it is in accordance with the applicable legislation. This amounts to giving American companies a property right over space resources in due form (Calimaq, 2015). Yet, the law passed by Congress seems to pretend the contrary, as it provides a so-called ‘Disclaimer of Extraterritorial Sovereignty’ in Section 3 of the Act (US Congress, 2015)

By the enactment of this Act, the United States– Exercises its jurisdiction over United States citizens and vessels, and foreign persons and vessels otherwise subject to its jurisdiction, in the exercise of the high seas freedom to engage in exploration for, and commercial recovery of, hard mineral resources of the deep seabed in accordance with generally accepted principles of international law recognized by the United States; but Does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any areas or resources in the deep seabed.

We can clearly see how this law circumvents the prohibition of national appropriation articulated by the 1967 Outer Space Treaty: the prohibition forbids states themselves from ‘national appropriation by claim of sovereignty’, but it does not prevent a private company from exploring or exploiting space resources for commercial purposes. It goes without saying that the enactment of this law was very much applauded by private companies planning to embark on asteroid mining. What is remarkable about this law is that it confirms the international commitment of the US not to assert sovereignty over any space resource, while simultaneously conferring private companies the right to appropriate resources therein without any restriction.

Under the Outer Space Treaty, the legal status of the ‘common things’ (res communes), under which certain resources are known to be common by nature (as in Roman law), is not formally addressed. Under Article I of the Outer Space Treaty, the outer space is not even declared to be the ‘common heritage of mankind’, but simply the ‘province of all mankind’ (United Nations, 1967). The notion of ‘common heritage’ was only explicitly introduced in 1967 to deal with the legal status of the deep seabed beyond the limits of national jurisdiction (United Nations General Assembly, 1967). Regardless of the ambiguity of this notion, particularly regarding the holder of such heritage, the idea of ‘heritage’ implies a double duty to both preserve and transmit it. However, international law limits the right of use for states only, as they alone are faced with the prohibition of appropriation. We are, therefore, presented with a way of extrapolating the res communes category inherited from Roman law, insofar as non-appropriation and common use are present, but subordinate to the goodwill of the states. Thus, we are faced with a cheap if not unfinished version of a ‘common’, which is entrusted to states, and limits state sovereignty without even calling it into question.

With the Competitiveness Act (US Congress, 2015), we are faced with an act of state sovereignty that manages to circumvent the prohibition of appropriation by a sovereign state without formally violating it. This represents a sort of ‘delegation’ under which the state, on the one hand, grants its citizens a legal title that it denies to itself, on the other, it does so in order to better guarantee it to those to whom it has been delegated. The imperium (state sovereignty) gives full licence for all candidates to the dominium, to privately control and appropriate any resources they are able to seize: statutory law enforces beforehand the power that technology provides. Beyond this collusion between the state and private companies, what emerges here is the powerful homology between state and private ownership: imperium and dominium appear to be based on two forms of a similar logic of ownership, which affirm one another. The primary challenge facing the heritage of mankind paradigm is that it does not fundamentally break with interstate logic and, as such, leaves leeway for private appropriation.

#### Development of space resources is still possible with a commons model. Property rights are not necessary. Existing models governing commons encourage responsible development, numerous examples prove.

Saletta Sterling & Orrman-Rossiter 18 [Sterling Saletta, Morgan; Orrman-Rossiter, Kevin (2018). Can space mining benefit all of humanity?: The resource fund and citizen's dividend model of Alaska, the ‘last frontier’. Space Policy, (), S0265964616300704–. doi:10.1016/j.spacepol.2018.02.002] CT

The Outer Space Treaty (OST) came into force in 1967 and, having been ratified by all the major space faring governments as well as some 100 other nations, the Outer Space Treaty serves as the basis for international space law, the current corpus juris spatialis. The treaty declares the exploration and use of outer space shall be for, “the benefit and in the interests of all countries [27]” and that outer space, as mentioned previously, “shall be the province of all mankind [27]”.

With the increased commercialization of space, and the entrance of new actors, both national and private, the OST has come under increased scrutiny, with calls to expand, modify, and even to abrogate it [35,36]. Issues surrounding the mining of celestial bodies have received particular attention and debate [37]. Of particular concern is the matter of exploitation licences and property rights [38]. The OST expressly forbids the “national appropriation by claims of sovereignty, by means of use or occupation, or by other means” [27] of outer space and celestial bodies. This is frequently interpreted to mean that the OST denies private property claims in outer space, some authors and individuals [39–41] have argued that appropriation by non-nationalentities is allowed.

The Outer Space Treaty, and its terrestrial analogues, UN Convention on the Law of the Seas (UNCLOS) and the Antarctica Treaty System (ATS) are ‘global commons regimes', though the terminology governing these commons differs and juridical concepts such as “common heritage of humanity” found in UNCLOS (and the Moon Treaty of 1979) and the “common province of mankind” found in the Outer Space Treaty have been interpreted in various manners. Due in part to these varying wordings, interpretations and attendant uncertainties, the need for a more comprehensive framework governing the environmental, ethical, and commercial aspects of space exploration, exploitation and colonization has been highlighted by many authors [30,33,34].

Some advocates for the commercial exploitation of space claim that the absence of property rights is a barrier to such ventures, and in particular to the mining of celestial bodies such as the Moon or near earth asteroids [35]. Some have gone so far as to suggest an abrogation of the OST in favor of a treaty that allows something like fee-simple ownership and what might best be called a California gold rush approach to outer space resource exploitation [36–38]. Advocates of this approach would give something like fee-simple ownership of outer space resources on a ‘first in time, first in right’ basis with no clear licensing regime for such activities [39]. In recent US law, Title IV of H.R. 2262- the U.S. Commercial Space Launch Competitiveness Act, grants ownership of asteroid resources to entities obtaining them but attempts to walk a fine line between this approach and international treaty obligations. It does not grant ownership of asteroid themselves, and explicitly states that resource exploitation must be in accordance with federal laws and existing treaty obligations, i.e. the OST [40]. How such eventual exploitation occurs, and under what precise national and international regulatory and licensing regimes, is thus still a matter for the future to decide.

On the other hand, it has also been suggested that modifications and additions to the OST based on terrestrial models will provide sufficient guarantee of the right to make profits from the exploitation of outer space resources. Henry Hertzfeld and Frans von der Dunk argue the current regime does not pose a problem for exploitation rights and that terrestrial models would allow private ventures the right to reasonable returns on investment from resource exploitation in space [41]. Furthermore, in addition to important, and possibly irreconcilable, differences between a California gold rush style approach and the OST [42], arguments suggesting fee-simple or similar ownership is necessary for profitable private outer space resource exploitation simply do not stand in the face of contrary evidence from numerous terrestrial examples. These include offshore oil drilling, mining, timber and grazing operations in the United States and internationally which are regularly and profitably undertaken without ownership [43]. Thus P. M. Sterns and L. I. Tennen argue that the current international regime does provide an adequate framework for commercial development in space, that fee-simple ownership is unnecessary and:

“those who advocate the renunciation and abandonment of the nonappropriation 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 [[44], p. 2439]”.

Thus, claims that a lack of private property rights in outer space will be a deterrent to commercial resource exploitation ventures in space do not reflect an adequate reflection and analysis of the manner in which current terrestrial practices might be extended into outer space without abrogating the current treaty regime. Nor would a system based on fee simple ownership be likely to tangibly benefit more than a small proportion of the world's population. Instead, the eventual wealth from exploiting celestial bodies would be concentrated in the hands of a few, exacerbating rather than alleviating existing problems for humanity and global sustainable development.

The Outer Space Treaty has provided an effective legal framework for the exploration of outer space for over 50 years. Based on the history of treaty regimes governing other international spaces, UNCLOS and the ATS, it seems likely that, in future, additional protocols and agreements will be layered onto the OST and that calls to abrogate and to negotiate a wholly new treaty system are unlikely to succeed. While low participation in the Moon Agreement, also known as the Moon Treaty of 1979, which has not been ratified by either the United States, Russia, or China, has raised questions of legitimacy, it has recently been argued that the Moon Treaty may receive renewed interest in the international community. René Lefeber argues that, far from stifling commercial ventures, the Moon Agreement “provides the best available option for mankind, states and industry to develop space mineral resources in a harmonious way [[5], p. 47]”, and that, as resource exploitation in outer space now seems likely, the need to elaborate an international regime to prevent conflict over resources may bring other parties to ratify, accede to, or sign the treaty.

Ultimately, some form of international governance of outer space as a global commons [45] building on the OST and the current corpus juris spatialis seems both more likely and more desirable than an abrogation of the OST and its replacement with an entirely new treaty regime. Thus, an international regime built upon this existing regime will need to be constructed which takes a balanced approach to space exploration, development and exploitation and which encourages entrepreneurial development but also moves beyond vague utopian platitudes to real and concrete benefits for all of humanity.

### Advantage 1: Space Debris

#### Increasing space debris levels inevitably set off a chain of collisions.

Chelsea MuñOz-Patchen, 19 - ("Regulating the Space Commons: Treating Space Debris as Abandoned Property in Violation of the Outer Space Treaty," University of Chicago, 2019, 12-6-2021, https://cjil.uchicago.edu/publication/regulating-space-commons-treating-space-debris-abandoned-property-violation-outer-space)//AW

Debris poses a threat to functioning space objects and astronauts in space, and may cause damage to the earth’s surface upon re-entry.29 Much of the small debris cannot be tracked due to its size and the velocity at which it travels, making it impossible to anticipate and maneuver to avoid collisions.30 To remain in orbit, debris must travel at speeds of up to 17,500 miles per hour.31 At this speed even very small pieces of debris can cause serious damage, threatening a spacecraft and causing expensive damage.32 There are millions of these very small pieces, and thousands of larger ones.33 The small-to-medium pieces of debris “continuously shed fragments like lens caps, booster upper stages, nuts, bolts, paint chips, motor sprays of aluminum particles, glass splinters, waste water, and bits of foil,” and may stay in orbit for decades or even centuries, posing an ongoing risk.34 Debris ten centimeters or larger in diameter creates the likelihood of complete destruction for any functioning satellite with which it collides.35 Large nonfunctional objects remaining in orbit are a collision threat, capable of creating huge amounts of space debris and taking up otherwise useful orbit space.36 This issue is of growing importance as more nations and companies gain the ability to launch satellites and other objects into space.37 From February 2009 through the end of 2010, more than thirty-two collision-avoidance maneuvers were reportedly used to avoid debris by various space agencies and satellite companies, and as of March 2012, the crew of the International Space Station (ISS) had to take shelter three times due to close calls with passing debris.38 These maneuvers require costly fuel usage and place a strain on astronauts.39 Furthermore, the launches of some spacecraft have “been delayed because of the presence of space debris in the planned flight paths.”40 In 2011, Euroconsult, a satellite consultant, projected that there would be “a 51% increase in satellites launched in the next decade over the number launched in the past decade.”41 In addition to satellites, the rise of commercial space tourism will also increase the number of objects launched into space and thus the amount of debris.42 The more objects are sent into space, and the more collisions create cascades of debris, the greater the risk of damage to vital satellites and other devices relied on for “weather forecasting, telecommunications, commerce, and national security.”43 The Space Debris Mitigation Guidelines44 were created by UNCOPUOS with input from the IADC and adopted in 2007.45 The guidelines were developed to address the problem of space debris and were intended to “increase mutual understanding on acceptable activities in space.”46 These guidelines are nonbinding but suggest best practices to implement at the national level when planning for a launch. Many nations have adopted the guidelines to some degree, and some have gone beyond what the guidelines suggest.47 While the guidelines do not address existing debris, they do much to prevent the creation of new debris. The Kessler Syndrome is the biggest concern with space debris. The Kessler Syndrome is a cascade created when debris hits a space object, creating new debris and setting off a chain reaction of collisions that eventually closes off entire orbits.48 The concern is that this cascade will occur when a tipping point is reached at which the natural removal rate cannot keep up with the amount of new debris added.49 At this point a collision could set off a cascade destroying all space objects within the orbit.50 In 2011, The National Research Council predicted that the Kessler Syndrome could happen within ten to twenty years.51 Donald J. Kessler, the astrophysicist and NASA scientist who theorized the Kessler Syndrome in 1978, believes this cascade may be a century away, meaning that there is still time to develop a solution.52

#### Most satellites are private

Therese **Wood, 20** - ("Who owns our orbit: Just how many satellites are there in space?," World Economic Forum, 10-23-2020, 12-8-2021, https://www.weforum.org/agenda/2020/10/visualizing-easrth-satellites-sapce-spacex)//AW

There are nearly 6,000 satellites circling the Earth, but only 40% are operational. Satellites are a vital part of our infrastructure, helping us to use GPS, access the internet and support studies of the Earth. Out of the 2,666 operational satellites circling the globe in April 2020, 1,007 were for communication services. 446 are used for observing the Earth and 97 for navigation/ GPS purposes. Over half of satellites in space are non-operational. For centuries, humans have looked to space and the stars for answers. The fascination is more than philosophical—it’s coupled with the need to solve problems here on Earth. Today, there are seemingly countless benefits and applications of space technology. Satellites, for instance, are becoming critical for everything from internet connectivity and precision agriculture, to border security and archaeological study. Right now, there are nearly 6,000 satellites circling our tiny planet. About 60% of those are defunct satellites—space junk—and roughly 40% are operational. As highlighted in the chart above, The Union of Concerned Scientists (UCS), determined that 2,666 operational satellites circled the globe in April of 2020. Over the coming decade, it’s estimated by Euroconsult that 990 satellites will be launched every year. This means that by 2028, there could be 15,000 satellites in orbit. Nearly 10,000 satellites will be launched form 2019-2028. Image: Visual Capitalist With SpaceX’s planned Starlink constellation of 12,000 satellites and Amazon’s proposed constellation in the works, the new space race continues its acceleration. Let’s take a closer look at who operates those satellites and how they apply their technology. Technology with a purpose Humans have long used space for navigation. While sailors once relied on the stars, today we use satellites for GPS, navigation, and various other applications. More than half of Earth’s operational satellites are launched for commercial purposes. About 61% of those provide communications, including everything from satellite TV and Internet of Things (IoT) connectivity to global internet. Over 1,000 satellites are for communication purposes. Image: Visual Capitalist Second to communications, 27% of commercial satellites have been launched for Earth Observation (EO) purposes, including environmental monitoring and border security. Commercial satellites, however, can serve multiple purposes. One week, a satellite may be ‘tasked’ to image a contested border. It could later be tasked to monitor the reclamation of a mining site or even the aftermath of a natural disaster. 54% of operational satellites are for commercial use. Image: Visual Capitalist Government and civil purposes make up 21% of all of Earth’s operational satellites, and military purposes come in at 13%. Who owns Earth’s orbit? Space operators SpaceX—founded by Elon Musk—is not only a disruptive launch provider for missions to the International Space Station (saving NASA millions). It’s also the largest commercial operator of satellites on the planet. With 358 satellites launched as of April, part of SpaceX’s mission is to boost navigation capabilities and supply the world with space-based internet. While the company operated 22% of the world’s operational satellites as of April, it went on to launch an additional 175 satellites in the span of one month, from August to September 2020.

#### Space debris is appropriation – permanently occupies and precludes free use. Requires regulation.

De Man 19 [Philip De Man, *Exclusive Use in an Inclusive Environment: The Meaning of the Non-Appropriation Principle for Space Resource Exploitatio*n, Springer (2019)] CT

It is only when a state refuses to remove a space object whose non-functional status is objectively established, that the exercise of the freedom to use outer space by other states is denied on the basis of an act or negligence that originates from a discretionary exercise of positive authority by a single state not grounded in the actual exercise of its own freedom to explore or use outer space. From this perspective, it is rather diffi cult, if not impossible, to distinguish the refusal to remove nonfunctional satellites at the end of their life from an infringement of Article II OST . Every activity in space entails an exclusion of others. 387 Only when this exclusion is enforced in the absence of justification by the enjoyment of the freedom to explore and use outer space does the denial of the correlative freedom of others amount to an unlawful form of appropriation. For, without use, the justifi cation of exclusivity can only be found in the primordial authority as arrogated by the owner to himself, on this same basis. Though they constitute a minority, a number of authors have construed the refusal to remove inactive satellites as a violation of the principles of the UN space treaties as well. As such, Williams has noted that it is to be wondered whether inactive satellites are complying with the requirements of Article I of the 1967 Space Treaty, particularly the « benefi t and interest of all countries» and «freedom of scientifi c investigation». It is submitted that, on these grounds, inactive satellites using up orbital positions, particularly in the GEO, are open to question. 388 While the author primarily analyses the problem from the perspective of Article I OST , Sterns and Tennen rightly contend that the refusal to remove a derelict craft from orbit is the functional equivalent of appropriation of outer space, prohibited by Article II of the Outer Space Treaty. […] Similarly, a nonfunctioning satellite remaining in orbit for an extended period of time could be considered as equivalent to a place-saving object. 389 Combining the fi nality of Articles I and II OST , Fernández-Brital suggests that the placement of non-functional artificial objects in space constitutes a form of appropriation, as it occupies a position that would otherwise be free for the use of others. Though the language is wanting for linguistic accuracy, the author’s observation demonstrates considerable legal perspicacity: [a]s it is a physical truth that two objects [cannot occupy] the same place at the same [time,] when somebody leaves a debris [ sic ] in outer space, [he] is performing the appropriation of the place occupied by the same [, which is] an [action] forbidden by the [Outer Space] Treaty as it is [known]. […] The Treaty allows the «use» of outer space. Placing or leaving rubbish in outer space is not using it in accordance with the Treaty, it is against the rules. 390 Considering the unlawful nature of the act of keeping a non-functional satellite in space to be established, Christol then proposes that due consideration would have to be given to the situation where a non-functional space object was occupying an orbital position of great value for telecommunication or factgathering purposes. The presence of such a space object in orbit does not serve the interests of anyone. Thus, legal and practical means must be devised imposing a legal duty on the launching authority to remove or have removed, if it does not have the capabilities, such an object from orbit. The station-keeping procedures which allow it to remain in a preferred orbital position must be employed to put it into a non-utilitarian [ sic ] and non-interfering orbit. 391 Such a legal obligation already exists, however. As such, a number of authors have argued that, if Article VIII OST should not yield to the powers of other states to remove the disused space object , the failure to remove such an object or to disown it should be construed as a fault or negligent action, or should at least trigger a presumption to this effect. 392 As to the international obligation that has been violated, it has been suggested that the failure to respect the UN space debris guidelines may serve as a point of reference to determine whether a state has exercised due diligence in launching and operating a space object in the sense of Article IX OST . 393 As the statements of the authors cited above have made clear, however, there is no need to rely on indirect indications derived from a set of unenforceable guidelines to suggest a violation of a binding principle of the Outer Space Treaty. For, by virtue of the failure to fulfi l the conditions of the ITU regulations to acquire the protected use of a particular orbital position, the active refusal to remove a disused space object from its occupied position, considering the conditionality of the right not to be interfered upon actual operation, constitutes a violation of the letter and spirit of the legal system established by Article II jo. Article I OST .

#### Collisions make orbit unusable, causing nuclear war, mass starvation, and economic destruction.

Les Johnson 13, Deputy Manager for NASA's Advanced Concepts Office at the Marshall Space Flight Center, Co-Investigator for the JAXA T-Rex Space Tether Experiment and PI of NASA's ProSEDS Experiment, Master's Degree in Physics from Vanderbilt University, Popular Science Writer, and NASA Technologist, Frequent Contributor to the Journal of the British Interplanetary Sodety and Member of the American Institute of Aeronautics and Astronautics, National Space Society, the World Future Society, and MENSA, Sky Alert!: When Satellites Fail, p. 9-12 [language modified]

Whatever the initial cause, the result may be the same. A satellite destroyed in orbit will break apart into thousands of pieces, each traveling at over 8 km/sec. This virtual shotgun blast, with pellets traveling 20 times faster than a bullet, will quickly spread out, with each pellet now following its own orbit around the Earth. With over 300,000 other pieces of junk already there, the tipping point is crossed and a runaway series of collisions begins. A few orbits later, two of the new debris pieces strike other satellites, causing them to explode into thousands more pieces of debris. The rate of collisions increases, now with more spacecraft being destroyed. Called the "Kessler Effect", after the NASA scientist who first warned of its dangers, these debris objects, now numbering in the millions, cascade around the Earth, destroying every satellite in low Earth orbit. Without an atmosphere to slow them down, thus allowing debris pieces to bum up, most debris (perhaps numbering in the millions) will remain in space for hundreds or thousands of years. Any new satellite will be threatened by destruction as soon as it enters space, effectively rendering many Earth orbits unusable. But what about us on the ground? How will this affect us? Imagine a world that suddenly loses all of its space technology. If you are like most people, then you would probably have a few fleeting thoughts about the Apollo-era missions to the Moon, perhaps a vision of the Space Shuttle launching astronauts into space for a visit to the International Space Station (ISS), or you might fondly recall the "wow" images taken by the orbiting Hubble Space Telescope. In short, you would know that things important to science would be lost, but you would likely not assume that their loss would have any impact on your daily life. Now imagine a world that suddenly loses network and cable television, accurate weather forecasts, Global Positioning System (GPS) navigation, some cellular phone networks, on-time delivery of food and medical supplies via truck and train to stores and hospitals in virtually every community in America, as well as science useful in monitoring such things as climate change and agricultural sustainability. Add to this the [disabling] ~~crippling~~ of the US military who now depend upon spy satellites, space-based communications systems, and GPS to know where their troops and supplies are located at all times and anywhere in the world. The result is a nightmarish world, one step away from nuclear war, economic disaster, and potential mass starvation. This is the world in which we are now perilously close to living. Space satellites now touch our lives in many ways. And, unfortunately, these satellites are extremely vulnerable to risks arising from a half-century of carelessness regarding protecting the space environment around the Earth as well as from potential adversaries such as China, North Korea, and Iran. No government policy has put us at risk. It has not been the result of a conspiracy. No, we are dependent upon them simply because they offer capabilities that are simply unavailable any other way. Individuals, corporations, and governments found ways to use the unique environment of space to provide services, make money, and better defend the country. In fact, only a few space visionaries and futurists could have foreseen where the advent of rocketry and space technology would take us a mere 50 years since those first satellites orbited the Earth. It was the slow progression of capability followed by dependence that puts us at risk. The exploration and use of space began in 1957 with the launch of Sputnik 1 by the Soviet Union. The United States soon followed with Explorer 1. Since then, the nations of the world have launched over 8,000 spacecraft. Of these, several hundred are still providing information and services to the global economy and the world's governments. Over time, nations, corporations, and individuals have grown accustomed to the services these spacecraft provide and many are dependent upon them. Commercial aviation, shipping, emergency services, vehicle fleet tracking, financial transactions, and agriculture are areas of the economy that are increasingly reliant on space. Telestar 1, launched into space in the year of my birth, 1962, relayed the world's first live transatlantic news feed and showed that space satellites can be used to relay television signals, telephone calls, and data. The modern telecommunications age was born. We've come a long way since Telstar; most television networks now distribute most, if not ali, of their programming via satellite. Cable television signals are received by local providers from satellite relays before being sent to our homes and businesses using cables. With 65% of US households relying on cable television and a growing percentage using satellite dishes to receive signals from direct-to-home satellite television providers, a large number of people would be cut off from vital information in an emergency should these satellites be destroyed. And communications satellites relay more than television signals. They serve as hosts to corporate video conferences and convey business, banking, and other commercial information to and from all areas of the planet. The first successful weather satellite was TIROS. Launched in 1960, TIROS operated for only 78 days but it served as the precursor for today's much more long-lived weather satellites, which provide continuous monitoring of weather conditions around the world. Without them, providing accurate weather forecasts for virtually any place on the globe more than a day in advance would be nearly impossible. Figure !.1 shows a satellite image of Hurricane Ivan approaching the Alabama Gulf coast in 2004. Without this type of information, evacuation warnings would have to be given more generally, resulting in needless evacuations and lost economic activity (from areas that avoid landfall) and potentially increasing loss of life in areas that may be unexpectedly hit. The formerly top-secret Corona spy satellites began operation in 1959 and provided critical information about the Soviet Union's military and industrial capabilities to a nervous West in a time of unprecedented paranoia and nuclear risk. With these satellites, US military planners were able to understand and assess the real military threat posed by the Soviet Union. They used information provided by spy satellites to help avert potential military confrontations on numerous occasions. Conversely, the Soviet Union's spy satellites were able to observe the United States and its allies, with similar results. It is nearly impossible to move an army and hide it from multiple eyes in the sky. Satellite information is critical to all aspects of US intelligence and military planning. Spy satellites are used to monitor compliance with international arms treaties and to assess the military activities of countries such as China, Russia, Iran, and North Korea. Figure 1.2 shows the capability of modem unclassified space-based imaging. The capability of the classified systems is presumed to be significantly better, providing much more detail. Losing these satellites would place global militaries on high alert and have them operating, literally, in the blind. Our military would suddenly become vulnerable in other areas as well. GPS, a network of 24-32 satellites in medium-Earth orbit, was developed to provide precise position information to the military, and it is now in common use by individuals and industry. The network, which became fully operational in 1993, allows our armed forces to know their exact locations anywhere in the world. It is used to guide bombs to their targets with unprecedented accuracy, requiring that only one bomb be used to destroy a target that would have previously required perhaps hundreds of bombs to destroy in the pre-GPS world (which, incidentally, has resulted in us reducing our stockpile of non-GPS-guided munitions dramatically). It allows soldiers to navigate in the dark or in adverse weather or sandstorms. Without GPS, our military advantage over potential adversaries would be dramatically reduced or eliminated.

### Advantage 2: Corporate Colonialism

#### Tech-billionaires advance a vision of private space colonization as a source of infinite resources to cure society’s ills. This rationalizes unrestrained consumption and replicates the logic of imperialism.

Mccormick 21 [Ted McCormick writes about the history of science, empire, and economic thought. He has a Ph.D. in history from Columbia University and teaches at Concordia University in Montreal. “The billionaire space race reflects a colonial mindset that fails to imagine a different world”. 8-15-2021. The Conversation. https://theconversation.com/the-billionaire-space-race-reflects-a-colonial-mindset-that-fails-to-imagine-a-different-world-165235. Accessed 12-15-2021; //marlborough JH]

It was a time of political uncertainty, cultural conflict and social change. Private ventures exploited technological advances and natural resources, generating unprecedented fortunes while wreaking havoc on local communities and environments. The working poor crowded cities, spurring property-holders to develop increased surveillance and incarceration regimes. Rural areas lay desolate, buildings vacant, churches empty — the stuff of moralistic elegies. ¶Epidemics raged, forcing quarantines in the ports and lockdowns in the streets. [Mortality data](https://wellcomecollection.org/works?query=%22bills+of+mortality%22&production.dates.from=1600&production.dates.to=1699&sortOrder=asc&sort=production.dates) was the stuff of weekly news and [commentary](https://doi.org/10.7227/TSC.27.3.2). ¶Depending on the perspective, mobility — chosen or compelled — was either the cause or the consequence of general disorder. Uncontrolled mobility was associated with political instability, moral degeneracy and social breakdown. However, one form of planned mobility promised to solve these problems: colonization. ¶Europe and its former empires have changed a lot since the 17th century. But the persistence of colonialism as a supposed panacea suggests we are not as far from the early modern period as we think. ¶Colonial promise of limitless growth ¶Seventeenth-century colonial schemes involved plantations around the Atlantic, and motivations that now sound archaic. Advocates of expansion such as the English writer Richard Hakluyt, whose [Discourse of Western Planting (1584)](http://nationalhumanitiescenter.org/pds/amerbegin/exploration/text5/hakluyt.pdf) outlined the benefits of empire for Queen Elizabeth: the colonization of the New World would prevent Spanish Catholic hegemony and provide a chance to claim Indigenous souls for Protestantism. ¶But a key promise was the economic and social renewal of the mother country through new commodities, trades and territory. Above all, planned mobility would cure the ills of apparent overpopulation. Sending the poor overseas to cut timber, mine gold or farm cane would, [according to Hakluyt](https://www.digitalhistory.uh.edu/disp_textbook.cfm?smtID=3&psid=70), turn the “multitudes of loiterers and idle vagabonds” that “swarm(ed)” England’s streets and “pestered and stuffed” its prisons into industrious workers, providing raw materials and a reason to multiply. Colonization would fuel limitless growth. ¶As English plantations took shape in Ulster, Virginia, New England and the Caribbean, “[projectors](https://doi.org/10.1163/15733823-00215p01)” — individuals (nearly always men) who promised to use new kinds of knowledge to radically and profitably transform society — tied mobility to new sciences and technologies. They were inspired as much by English philosopher Francis Bacon’s vision of a tech-centred state in [The New Atlantis](https://www.gutenberg.org/files/2434/2434-h/2434-h.htm) as by his advocacy of observation and experiment. ¶Discovery and invention ¶The English agriculturalist Gabriel Plattes cautioned in 1639 that “[the finding of new worlds is not like to be a perpetual trade](https://quod.lib.umich.edu/cgi/t/text/pageviewer-idx?cc=eebo2;c=eebo2;idno=a68588.0001.001;node=A68588.0001.001:5;seq=29;vid=15242;page=root;view=text).” But many more saw a supposedly vacant America as an invitation to transplant people, plants and machinery. ¶The inventor Cressy Dymock (from Lincolnshire, where fen-drainage schemes were turning wetlands dry) sought support for a “[perpetual motion engine](https://www.dhi.ac.uk/hartlib/view?docset=main&docname=62A_08)” that would plough fields in England, clear forest in Virginia and drive sugar mills in Barbados. Dymock identified private profit and the public good by speeding plantation and replacing costly draught animals with cheaper enslaved labour. Projects across the empire would employ the idle, create “elbow-room,” heal “unnatural divisions” and make England “[the garden of the world](https://www.dhi.ac.uk/hartlib/view?docset=main&docname=64_18).” ¶Extraterrestrial exploration ¶Today, the moon and Mars are in projectors’ sights. And the promises billionaires Elon Musk and Jeff Bezos make for colonization are similar in ambition to those of four centuries ago. ¶As Bezos told an audience at the [International Space Development Conference](https://www.geekwire.com/2018/jeff-bezos-isdc-space-vision/) in 2018: “We will have to leave this planet, and we’re going to leave it, and it’s going to make this planet better.” Bezos traces his thinking to Princeton physicist Gerald O’Neill, whose 1974 article “[The Colonization of Space](https://space.nss.org/the-colonization-of-space-gerard-k-o-neill-physics-today-1974/)” (and 1977 book, The High Frontier) presented orbiting settlements as solutions to nearly every major problem facing the Earth. Bezos echoes O’Neill’s proposal to move heavy industry — and industrial labour — off the planet, rezoning Earth as a mostly residential, green space. A garden, as it were. ¶Musk’s plans for Mars are at once more cynical and more grandiose, in timeline and technical requirements if not in ultimate extent. They center on the dubious possibility of “[terraforming](https://www.businessinsider.com/nasa-just-quashed-elon-musks-plans-to-make-mars-habitable-for-humans-2018-7)” Mars using resources and technologies that don’t yet exist. ¶Musk planned to [send the first humans to Mars in 2024](https://www.businessinsider.com/elon-musk-spacex-mars-plan-timeline-2018-10), and by 2030, he envisioned breaking ground on a city, [launching as many as 100,000 voyages from Earth to Mars](https://www.businessinsider.com/elon-musk-says-we-could-put-a-million-people-on-mars-within-a-century-2015-6) within a century. ¶As of 2020, the timeline had been pushed back slightly, in part because terraforming may require bombarding Mars with 10,000 nuclear missiles to start. But the vision – a Mars of thriving crops, pizza joints and “entrepreneurial opportunities,” preserving life and paying dividends while Earth becomes increasingly uninhabitable — remains. Like the colonial [company-states](https://doi.org/10.1177/1354066120928127) of the 17th and 18th centuries, [Musk’s SpaceX leans heavily on government backing but will make its own laws on its newly settled planet](http://bostonreview.net/science-nature/alina-utrata-lost-space). ¶A failure of the imagination ¶The techno-utopian visions of Musk and Bezos betray some of the same assumptions as their early modern forebears. They offer colonialism as a panacea for complex social, political and economic ills, rather than attempting to work towards a better world within the constraints of our environment. ¶

#### This private expansion into space results in corporate colonization of planets that undermines the interests of the rest of humanity. Spencer ’17

Spencer, Keith A. [senior editor at Salon]“Against Mars-a-Lago: Why SpaceX's Mars Colonization Plan Should Terrify You.” Salon, Salon.com, Oct. 8 2017, https://www.salon.com/2017/10/08/against-mars-a-lago-why-spacexs-mars-colonization-plan-should-terrify-you/.

When CEO Elon Musk announced last month that his aerospace company SpaceX would be [sending cargo missions](https://www.washingtonpost.com/news/the-switch/wp/2017/09/29/elon-musk-says-his-next-spaceship-could-not-only-take-to-you-the-moon-and-mars-but-from-n-y-to-london-in-29-minutes/?utm_term=.85279aa2076a) to Mars by 2022 — the first step in his tourism-driven colonization plan — a small cheer went up among space and science enthusiasts. Writing in the New York Post, Stephen Carter [called](http://nypost.com/2017/10/07/elon-musks-inspiring-vision-for-reaching-mars-and-the-stars/) Musk’s vision “inspiring,” a salve for politically contentious times. “Our species has turned its vision inward; our image of human possibility has grown cramped and pessimistic,” Carter wrote: "We dream less of reaching the stars than of winning the next election; less of maturing as a species than of shunning those who are different; less of the blessings of an advanced technological tomorrow than of an apocalyptic future marked by a desperate struggle to survive. Maybe a focus on the possibility of reaching our nearest planetary neighbor will help change all that." The Post editorial reflected a growing media consensus that humankind’s ultimate destiny is the colonization of the solar system — yet on a private basis. American government leaders generally agree with this vision. Obama egged on the [privatization of NASA](http://blogs.discovermagazine.com/80beats/2010/02/01/obamas-nasa-budget-so-long-moon-missions-hello-private-spaceflight/) by legislating a policy shift to private commercial spaceflight, awarding government contracts to private companies like SpaceX to shuttle supplies to the International Space Station. “Governments can develop new technology and do some of the exciting early exploration but in the long run it's the private sector that finds ways to make profit, finds ways to expand humanity,” [said](http://www.theregister.co.uk/2012/03/08/nasa_private_space_nasa/) Dr. S. Pete Worden, the director of the NASA Ames Research lab, in 2012. And in a Wall Street Journal [op-ed](https://www.wsj.com/articles/america-will-return-to-the-moonand-go-beyond-1507158341?mod=e2fb) this week, Vice President Mike Pence wrote of his ambitions to bring [American-style capitalism to the stars](https://www.salon.com/2017/08/06/tacoma-the-next-video-game-from-gone-home-creators-imagines-the-gig-economy-in-space/): “In the years to come, American industry must be the first to maintain a constant commercial human presence in low-Earth orbit, to expand the sphere of the economy beyond this blue marble,” Pence wrote. One wonders if these luminaries know their history. There has be no instance in which a private corporation became a colonizing power that did not end badly for everyone besides the shareholders. The East India Company is perhaps the finest portent of Musk’s Martian ambitions. In 1765, the East India Company forced the Mughal emperor to sign a legal agreement that would essentially permit their company to become the de facto rulers of Bengal. The East India Company then collected taxes and used its private army, which was over 200,000 strong by the early 19th century, to repress those who got in the way of its profit margins. “It was not the British government that seized India at the end of the 18th century, but a dangerously unregulated private company headquartered in one small office, five windows wide, in London, and managed in India by an unstable sociopath,” [writes](https://www.theguardian.com/world/2015/mar/04/east-india-company-original-corporate-raiders) William Dalrymple in the Guardian. “It almost certainly remains the supreme act of corporate violence in world history.” The East India Company came to colonize much of the Indian subcontinent. In the modern era, an era in which the right of corporations to do what they want, unencumbered, has become a [sacrosanct](https://www.salon.com/2017/09/19/trumps-interior-secretary-on-national-monuments-sell-em-and-strip-em/) [right](https://www.salon.com/2016/12/15/exxonmobil-ceo-and-trump-pick-rex-tillerson-my-philosophy-is-to-make-money_partner/) in the eyes of many politicians, the lessons of the East India Company seem to have been all but forgotten. As Dalrymple writes: Democracy as we know it was considered an advance over feudalism because of the power that it gave the commoners to share in collective governance. To privately colonize a nation, much less a planet, means ceding governance and control back to corporations whose interest is not ours, and indeed, is always at odds with workers and residents

— particularly in a resource-limited environment like a spaceship or the red planet. Even if, as Musk suggests, a private foundation is [put in charge](https://www.jacobinmag.com/2017/02/mars-elon-musk-space-exploration-nasa-colonization) of running the show on Mars, their interests will inherently be at [odds with the workers](http://www.dailykos.com/story/2015/5/5/1372730/-Skylab-and-the-Sit-Down-Strike-in-Space) and employees involved. After all, a private foundation [is not a democracy](https://www.jacobinmag.com/2015/11/philanthropy-charity-banga-carnegie-gates-foundation-development); and as major philanthropic organizations like the Bill and Melinda Gates Foundation [illustrate](https://www.jacobinmag.com/2015/11/philanthropy-charity-banga-carnegie-gates-foundation-development), often [do the bidding](http://www.peterfrase.com/2011/08/the-decay-of-the-capitalist-class/) of their rich donors, and take an [important role in ripening industries](https://www.salon.com/2016/02/21/corporate_reformers_wreck_public_schools_billionaire_foundations_and_wall_street_financiers_are_not_out_to_help_your_kids_learn/) and regions for exploitation by Western corporations. Yet Mars’ colonization is a bit different than Bengal, namely in that it is not merely underdeveloped; it is undeveloped. How do you start an entirely new economy on a virgin world with no industry? After all, Martian resource extraction and trade with Earth is not feasible; the cost of transporting material across the solar system is astronomical, and there are no obvious minerals on Mars that we don’t already have in abundance on Earth. The only basis for colonization of Mars that Musk can conceive of is one based on tourism: the rich pay an amount — Musk quotes the ticket price at [$200,000 if he can get 1 million tourists](https://www.recode.net/2016/9/27/13081488/elon-musk-spacex-mars-colony-space-travel-funding-rocket-nasa) to pay that — that entitles them to a round-trip ticket. And while they’re on Mars and traveling to it, they luxuriate: Musk has [assured](http://www.telegraph.co.uk/science/2017/06/21/elon-musk-create-city-mars-million-inhabitants/) that the trip would be “fun.” This is what makes Musk’s Mars vision so different than, say, the Apollo missions or the International Space Station. This isn’t really exploration for humanity’s sake — there’s not that much science assumed here, as there was in the Moon missions. Musk wants to build the ultimate luxury package, exclusively for the richest among us. Musk isn’t trying to build something akin to Matt Damon’s spartan research base in "The Martian." He wants to build Mars-a-Lago. And an economy based on tourism, particularly high-end tourism, needs employees — even if a high degree of automation is assumed. And as I’ve written about [before](https://www.jacobinmag.com/2017/02/mars-elon-musk-space-exploration-nasa-colonization), that means a lot of labor at the lowest cost possible. Imagine signing away years of your life to be a housekeeper in the Mars-a-Lago hotel, with your communications, water, food, energy usage, even oxygen tightly managed by your employer, and no government to file a grievance to if your employer cuts your wages, harasses you, cuts off your oxygen. Where would Mars-a-Lago's employees turn if their rights were impinged upon? Oh wait, this planet is run privately? You have no rights. Musk's vision for Mars colonization is inherently authoritarian. The potential for the existence of the employees of the Martian tourism industry to slip into something resembling indentured servitude, even slavery, cannot be underestimated. We have government regulations for a reason on Earth — to protect us from the fresh horror Musk hopes to export to Mars. If he's considered these questions, he doesn't seem to care; for Musk, the devil's in the technological and financial details. The social and political are pretty uninteresting to him. This is unsurprising; accounts from those who have worked closely with him hint that he, like many CEOs, [may be a sociopath](http://www.businessinsider.com/working-with-elon-musk-tesla-2015-5). Even as a space enthusiast, I cannot get excited about the private colonization of Mars. You shouldn’t be either. This is not a giant leap for mankind; this is the next great leap in plutocracy. The mere notion that global wealth is so unevenly distributed that a small but sufficient sum of rich people could afford this trip is unsettling, indicative of the era of astonishing economic inequality in which we suffer. Thomas Frank, writing in Harpers, once [wrote of](https://harpers.org/archive/2011/11/the-bleakness-stakes/) a popular t-shirt he sighted while picnicking in a small West Virginia coal town: “Mine it union or keep it in the ground.” The idea, of course, is that the corporations interested in resource extraction do not care whatsoever about their workers’ health, safety, or well-being; the union had their interests at heart, and was able to negotiate for safety, job security, and so on. I’d like to see a similar t-shirt or bumper sticker emerge among scientists and space enthusiasts: “Explore Mars democratically, or keep it in the sky.”