# Aff

#### I affirm the resolution: the appropriation of outer space by private entities is unjust.

## Definitions

#### According to Merriam-Webster, outer space is defined as

#### <https://www.merriam-webster.com/dictionary/outer%20space>

Definition of outer space : space immediately outside the earth's atmosphere broadly : interplanetary or interstellar space

#### According to the Code of Federal Regulations, a private entity is entity other than a State, [local government](https://www.law.cornell.edu/definitions/index.php?width=840&height=800&iframe=true&def_id=468a5d5f76c860e38c21e0c6e4113af3&term_occur=999&term_src=Title:2:Subtitle:A:Chapter:I:Part:175:175.25), [Indian tribe](https://www.law.cornell.edu/definitions/index.php?width=840&height=800&iframe=true&def_id=f7621a836c6d1b1ed6abf21854adf7c9&term_occur=999&term_src=Title:2:Subtitle:A:Chapter:I:Part:175:175.25), or [foreign public entity](https://www.law.cornell.edu/definitions/index.php?width=840&height=800&iframe=true&def_id=e342a5ecb269b8b1efa289a7bce3942a&term_occur=999&term_src=Title:2:Subtitle:A:Chapter:I:Part:175:175.25).

#### https://www.law.cornell.edu/cfr/text/2/175.25

### Structural Violence

#### I value justice as the resolution asks us to determine whether space appropriation is unjust

#### My value criterion is preventing structural violence.

#### Structural Violence is according to

**Farmer, Connors & Simmons**, 1996, “Women, Poverty, and AIDS: Sex, Drugs, and Structural Violence” Monroe, Maine: Common Courage Press./ Livingston RB

**large scale forces** ranging from gender inequality and racism to poverty **which structure unequal access to goods and services**

#### Prefer for 2 reasons:

#### 1] It comes before my opponents value criterion. Justice must be applied equally to everyone, or else it wouldn’t be just. Oppression excludes minorities from moral consideration.

#### Winter and Leighton explain:

Deborah DuNann Winter and Dana C. Leighton. Winter "Peace, conflict, and violence: Peace psychology in the 21st century." 1999

Finally, to recognize the operation of structural violence forces us to ask questions about how and why we tolerate it, questions which often have painful answers for the privileged elite who unconsciously support it. A final question of this section is how and why we allow ourselves to be so oblivious to structural violence. Susan Opotow offers an intriguing set of answers, in her article Social Injustice. She argues that **our normal** perceptual/**cognitive processes divide people into in-groups and out-groups**. Those outside our group lie outside our scope of justice. Injustice that would be instantaneously confronted if it occurred to someone we love or know is barely noticed if it occurs to strangers or those who are invisible or irrelevant. We do not seem to be able to open our minds and our hearts to everyone, so we draw conceptual lines between those who are in and out of our moral circle**. Those who fall outside are morally excluded,** and become either invisible, or demeaned in some way **so** that **we** **do not have to acknowledge the injustice they suffer.** **Moral exclusion is a human failing**, but Opotow argues convincingly that it is an outcome of everyday social cognition. To reduce its nefarious effects, we must be vigilant in noticing and listening to oppressed, invisible, outsiders. Inclusionary thinking can be fostered by relationships, communication, and appreciation of diversity. Like Opotow, all the authors in this section point out **that structural violence is not inevitable if we become aware of it**s operation, **and** build systematic ways to **mitigate its effects.** Learning about structural violence may be discouraging, overwhelming, or maddening, but these papers encourage us to step beyond guilt and anger, and begin to think about how to reduce structural violence. All the authors in this section note that the same structures (such as global communication and normal social cognition) which feed structural violence, can also be used to empower citizens to reduce it. In the long run, reducing structural violence by reclaiming neighborhoods, demanding social justice and living wages, providing prenatal care, alleviating sexism, and celebrating local cultures, will be our most surefooted path to building lasting peace.

#### 2] Probability first – risk logic creates *infinite deferral* and *implodes* in on itself.

Oliver Kessler and Christopher Daase 4-1-2008– Kessler has a PhD in International Relations and is a professor of sociology at The University of Bielefeld. Daase is a professor at the department of political science at the University of Munich. ["From Insecurity to Uncertainty: Risk and the Paradox of Security Politics", Accessible Online at: http://journals.sagepub.com/doi/abs/10.1177/030437540803300206?journalCode=alta] @ AG

The problem of the second method is that it is very difficult to "calculate" politically unacceptable losses. If the risk of terrorism is defined in traditional terms by **probability and potential loss**, then the focus on dramatic terror attacks leads to **the marginalization of probabilities**. The reason is that even the highest degree of improbability becomes irrelevant as the measure of loss goes to infinity.50 The mathematical calculation of the risk of terrorism thus tends to overestimate and to dramatize the danger. This has consequences beyond the actual risk assessment for the formulation and execution of "risk policies": If one factor of the risk calculation approaches infinity (e.g., if a case of nuclear terrorism is envisaged), then there is no balanced measure for antiterrorist efforts, and risk management as a rational endeavor breaks down. Under the historical con- dition of bipolari ty, the "ultimate" threat with nuclear weapons could be balanced by a similar counterthreat, and new equilibria could be achieved, albeit on higher levels of nuclear overkill. Under the new condition of uncertainty, no such rational balancing is possible since knowledge about actors, their motives and capabilities, is largely absent. The second form of security policy that emerges when the deterrence model collapses mirrors the "social probability" approach. It **represents a logic of catastrophe**. In contrast to risk management framed in line with logical probability theory, the logic of catastrophe does not attempt to provide means of absorbing uncertainty. Rather, it takes uncertainty as constitutive for the logic itself; uncertainty is a crucial precondition for catastrophes. In particular, catastrophes happen at once, without a warning, but with major implications for the world polity. In this category, we find the impact of meteorites, Mars attacks, the tsunami in South East Asia, and 9/11. To conceive of terrorism as catastrophe has consequences for the formulation of an adequate security policy. Since catastrophes happen **irrespectively of human activity** or inactivity, **no political action could possibly prevent them.** Of course, there are precautions that can be taken, but the framing of terrorist attack as a catastrophe points to spatial and temporal characteristics that are beyond "ratio- nality." Thus, political **decision makers are exempted from** the **responsibility** to provide security - as long as they at least try to preempt an attack. Interestingly enough, 9/11 was framed as catastro- phe in various commissions dealing with the question of who was responsible and whether it could have been prevented. This makes clear that under the condition of uncertainty, there are no objective criteria that could serve as an anchor for measur- ing dangers and assessing the quality of political responses. For ex- ample, as much as one might object to certain measures by the US administration, it is almost impossible to "measure" the success of countermeasures. Of course, there might be a subjective assessment of specific shortcomings or failures, but there is no "common" cur- rency to evaluate them. As a consequence, the framework of the security dilemma fails to capture the **basic uncertainties**. Pushing the door open for the security paradox, **the main problem** of security analysis then **becomes** the question **how to integrate dangers** in risk assessments and security policies **about which simply nothing is known**. In the mid 1990s, a Rand study entitled "New Challenges for Defense Planning" addressed this issue arguing that "most striking is the fact that we do not even know who or what will constitute the most serious future threat."51 In order to cope with this challenge it would be essential, another Rand researcher wrote, to break free from the "tyranny" of plausible scenario planning. The decisive step would be to create "**discontinuous scenarios** ... in which there is **no plausible audit trail or storyline from current events**"52 These nonstandard scenarios were later called "wild cards" and became important in the current US strategic discourse. They justified the transformation from a threat-based toward a capability- based defense planning strategy.53 The problem with this kind of risk assessment is, however, that **even the most absurd scenarios can gain plausibility**. By constructing a chain of potentialities, improbable events are **linked** and brought into the realm of the possible, if not even the **probable**. "Although the likelihood of the scenario dwindles with each step, the residual impression is one of plausibility."54 This so-called Othello effect has been effective in the dawn of the recent war in Iraq. The connection between Saddam Hussein and AI Qaeda that the US government tried to prove was disputed from the very beginning. False evidence was again and again presented and refuted, but this did not prevent the administration from presenting as the main rationale for war the improbable yet possible connection between Iraq and the terrorist network and the improbable yet possible proliferation of an improbable yet possible nuclear weapon into the hands of Bin Laden. As Donald Rumsfeld famously said: "**Absence of evidence is not evidence of absence.**" This sentence indicates that under the condition of genuine uncertainty, different evidence criteria prevail than in situations where security problems can be assessed with relative certainty.

### Contention 1 is developing countries

#### The ability to appropriate outer space keeps developing nations from getting valuable resources- it’s already happened with satellites

**Giacomin 19**, Nicolas Giacomin, author on space, 12-4-2019, "The Bogotá Declaration and space law," Space Legal Issues, <https://www.spacelegalissues.com/the-bogota-declaration-and-space-law/> Livingston RB

The practice of developed states **is based** on free access and priority given to the first **satellites** placed in the geostationary orbit. The placing into orbit of satellites is in accordance with the 1967 Outer Space Treaty. These satellites have the right to pursue a trajectory without interference from satellites later placed in orbit. In addition, the international regulation of the radio spectrum has favored the development of satellite telecommunications systems. Increasing congestion of the orbit and frequencies may **limit the access and opportunities of developing countries in the future**. **It will become more and more difficult** to use frequencies from the geostationary orbit under satisfactory conditions (without creating or suffering radio interference, or without incurring additional costs). Common law regime for the use of frequencies traditionally protects the first users against such interference. In this situation, new entrants must design their space telecommunication systems taking into account both the trajectory and the frequencies used by the satellites in place. Unlike the regime of orbit and outer space in general, for more than half a century, there has already been an institutionalized mechanism for access to radio frequencies. This mechanism makes it possible to coordinate the use of frequencies and thereby, prevents harmful interference between radio stations under the jurisdiction of different states. In order to avoid anarchy in this area, ITU distributes radio waves between recognized radio services. Thus, the frequencies used by the various services at the international level are determined in advance before the establishment of telecommunications stations. Any state wishing to establish a station and allocate a frequency band, must comply with the service allocation deriving from international regulations. While inter-service distribution is pre-established, the distribution among states within a given service is traditionally done according to their order of arrival: the first to notify the use of a frequency band by a station under its jurisdiction acquires a right of priority at the international level. Frequency assignments by states must be registered with the ITU. Within the latter, the International Frequency Registration Board examines the compliance of these assignments with the regulations in force and the possibility of interference with other stations already in operation. In case of conflict between an existing user registered before the International Frequency Registration Board and a newcomer, preference is given to the first one; this is sometimes described as **“first come, first served”**. Some **developing countries have argued that** the utilization of geostationary **orbit by developed countries is contrary to the 1967 Outer Space Treaty** and, in particular, to the principle of non-appropriation. For a variety of reasons, **this challenge to current practice does not really addresses the problem** of orbital saturation. First, the 1967 Outer Space Treaty and the prohibition of appropriation do not limit the use of orbital space. In addition, this instrument appears unable to provide a solution to the problem of saturation of the orbit, because it is primarily due to exogenous constraints related to the use of radio frequencies. Access to the frequency spectrum depends on International Telecommunications Law and not on space law.

#### This locks in existing global structural violence by perpetuating inequality into space

**Reinstein 99**, Ezra J. Reinstein, Owning Outer Space, 20 Nw. J. Int'l L. & Bus. 59 (1999-2000) <https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1500&context=njilb> Livingston RB

The rights of less-developed nations create a concern that is both political and moral in character. As a matter of political reality, the less developed nations wield considerable power, due in no small part to majority voting systems in the major international regulatory bodies. Some feel, and developing nations argue, that **it is morally imperative to take the interests of the non-space-capable nations into account when designing a system of space property law.** A regime based on **the "right of grab,"** the first-come, first-served theory of property acquisition**, should be feared**. **By the time space-incapable nations develop the** technological **prowess and capital** reserves **to fund** meaningful **development of** outer **space, the earlier** space-faring **nations,** left unchecked, might already **have locked up the** most accessible and valuable **resources. Present inequities of global wealth distribution** thus **would be carried forward into** the **space** age. 38

#### Private appropriation of space amplifies inequality on Earth. Stockwell 20

Samuel Stockwell, 7-20-2020, "Legal ‘Black Holes’ in Outer Space: The Regulation of Private Space Companies," E-International Relations, <https://www.e-ir.info/2020/07/20/legal-black-holes-in-outer-space-the-regulation-of-private-space-companies/> //marlborough JH

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

#### Private control of space inevitably leads to exploitation. Spencer ‘20

Spencer, Keith A. [senior editor at Salon]“Against Mars-a-Lago: Why SpaceX's Mars Colonization Plan Should Terrify You.” Salon, Salon.com, 7 Jan. 2020, 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.”

#### Companies that are going to colonize space are committing rampant exploitation on earth

**Sanches et al 21**, Valter Sanches, Christy Hoffman and Casper Gelderblom, The Guardian, “Amazon workers are rising up around the world to say: enough” 5-26-21 Casper Gelderblom is coordinator at the Progressive International and a PhD researcher at the European University Institute <https://www.theguardian.com/commentisfree/2021/may/26/amazon-workers-are-rising-up-around-the-world-to-say-enough> Livingston RB

Throughout Amazon’s supply chain, **Bezos**’s behemoth **violates workers’ safety, dignity and privacy**, putting them to work in worksites designed **to squeeze as much labor out of them for as little money as possible**. Workers do not take this lying down. Supported by a myriad of progressive allies, there is labor resistance all over Amazon’s global map, with strikes and protests from Spain to São Paulo, from Delhi to Berlin. On Black Friday last year, as scrutiny over [Amazon’s anti-union practices](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.cnbc.com%2F2020%2F10%2F24%2Fhow-amazon-prevents-unions-by-surveilling-employee-activism.html&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7C1dcbba8fc9094a0425f008d87bdbd89c%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637395531441993495%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=Pii6wiAhFWICa56gkiBTAaFCCwpxmSCzojO4F28cNsk%3D&reserved=0%22%20%5Ct%20%22_blank), [environmental impact](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.wired.com%2Fstory%2Famazon-activists-climate-change-efforts-fall-short%2F&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7C1dcbba8fc9094a0425f008d87bdbd89c%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637395531442003485%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=097n3w%2Ba9DCgwKdF9wL%2Fc0c57yL57j16ajTlHxfnEnI%3D&reserved=0%22%20%5Ct%20%22_blank), [tax avoidance](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.newsweek.com%2Faoc-condemns-us-system-that-allows-trump-amazon-pay-almost-no-taxes-doesnt-fund-health-care-1535097&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7C1dcbba8fc9094a0425f008d87bdbd89c%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637395531442003485%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=Jq7HRHjjeWAeBbn0mKTJdrfHC6AS1OynjEiOIOWPmNs%3D&reserved=0%22%20%5Ct%20%22_blank) and [worker safety](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.revealnews.org%2Farticle%2Fhow-amazon-hid-its-safety-crisis%2F&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7C1dcbba8fc9094a0425f008d87bdbd89c%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637395531442013474%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=z0oqmL5WCijh8UluJlR9VVR3x7dD0DMFHHfc91YaVzM%3D&reserved=0%22%20%5Ct%20%22_blank) intensified in [Europe](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.theguardian.com%2Ftechnology%2F2020%2Foct%2F07%2Feu-lawmakers-ask-jeff-bezos-whether-amazon-spies-on-politicians&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7C1dcbba8fc9094a0425f008d87bdbd89c%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637395531442013474%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=f%2FZKzZTEv%2FwM8uA6Dw8gBhV%2FUiwzhTYbo%2BhLYc%2FyKlY%3D&reserved=0%22%20%5Ct%20%22_blank) and the [United States](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.nasdaq.com%2Farticles%2Fu.s.-senators-question-amazon-on-concerns-it-tracks-employees-limits-unionization-2020-10&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7C1dcbba8fc9094a0425f008d87bdbd89c%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637395531442023470%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=VjWXJXDtVQ78ZPA%2BuM%2BxSFVbRKQGZrkfe482NWkMVnQ%3D&reserved=0%22%20%5Ct%20%22_blank), UNI Global Union, IndustriaALL, [Progressive International](https://www.uniglobalunion.org/news/www.progressive.international), Oxfam, Greenpeace and dozens of civil society organizations, environmentalists and tax watchdogs organized protest actions in 12 countries, uniting under the banner of Make Amazon Pay. Aided by **shocking media reports about**[**dangerous**](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.google.com%2Furl%3Fq%3Dhttps%3A%2F%2Fwww.google.com%2Furl%3Fq%253Dhttps%3A%2F%2Fwww.theguardian.com%2Fbusiness%2F2018%2Fmay%2F31%2Famazon-accused-of-treating-uk-warehouse-staff-like-robots%2526amp%3Bsa%253DD%2526amp%3Bsource%253Deditors%2526amp%3Bust%253D1621361884986000%2526amp%3Busg%253DAOvVaw3hm30EqRaOyrKJfbSZHKqS%26sa%3DD%26source%3Deditors%26ust%3D1621361885019000%26usg%3DAOvVaw3VN2r42izZJkOsR0FDdt7x&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7Ce501319943174e733a7c08d91a976556%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637570059807744468%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=qwi7J8dRnS0WIU7ogALwTwqx8qUPuTqGl58jU6xDepo%3D&reserved=0)**and even**[**dehumanizing**](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.google.com%2Furl%3Fq%3Dhttps%3A%2F%2Fwww.google.com%2Furl%3Fq%253Dhttps%3A%2F%2Fwww.businessinsider.com%2Famazon-drivers-say-peeing-in-bottles-common-despite-company-denials-2021-3%3FIR%25253DT%2526amp%3Bsa%253DD%2526amp%3Bsource%253Deditors%2526amp%3Bust%253D1621361884986000%2526amp%3Busg%253DAOvVaw03VCnsy7bAOwRJtpYWwhY9%26sa%3DD%26source%3Deditors%26ust%3D1621361885019000%26usg%3DAOvVaw0cC-rG7Weo8b5TG1lBlvrF&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7Ce501319943174e733a7c08d91a976556%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637570059807754457%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=qxiswMdl7pztTMrxvqmaNaRpnoU6ivf5kZeiA7WJ56Y%3D&reserved=0)**working conditions**, this activism draws attention to Amazon’s treatment of the warehouse workers who stow, store and sort its signature packages. As a result, the **corporation’s efforts to conceal its conduct in this part of its global empire are faltering**. In the UK, where most Amazon workers are employed in the corporation’s so-called “Fulfillment Centers”, a poll late last year found that only 24% of respondents [believed](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.google.com%2Furl%3Fq%3Dhttps%3A%2F%2Fwww.google.com%2Furl%3Fq%253Dhttps%3A%2F%2Fwww.independent.co.uk%2Fbusiness%2Famazon-powerful-poll-progressive-international-b1760527.html%2526amp%3Bsa%253DD%2526amp%3Bsource%253Deditors%2526amp%3Bust%253D1621361884987000%2526amp%3Busg%253DAOvVaw23vQKeCZ93hgI5vRxDaGdS%26sa%3DD%26source%3Deditors%26ust%3D1621361885019000%26usg%3DAOvVaw1GcccwhMyHRwBv2RNU8kCk&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7Ce501319943174e733a7c08d91a976556%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637570059807754457%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=RM6SrBmg1JjwgOW2p3fIOjNrB9JEgr7KBzA9AFVxwNU%3D&reserved=0) Amazon treated its workers fairly. In the US, where Amazon recently worked to undermine a union campaign in Alabama with tactics that union leaders say [prevented a free and fair election](https://www.cnbc.com/2021/04/19/amazon-prevented-free-and-fair-election-in-alabama-union-alleges.html) and violated federal law, almost 80% of respondents [supported](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.google.com%2Furl%3Fq%3Dhttps%3A%2F%2Fwww.google.com%2Furl%3Fq%253Dhttps%3A%2F%2Fwww.alreporter.com%2F2021%2F04%2F06%2Fafl-cio-poll-shows-majority-of-respondents-support-bessemer-union-efforts%2F%2526amp%3Bsa%253DD%2526amp%3Bsource%253Deditors%2526amp%3Bust%253D1621361884988000%2526amp%3Busg%253DAOvVaw2He1hEVYa5LLTuX7zCElE4%26sa%3DD%26source%3Deditors%26ust%3D1621361885019000%26usg%3DAOvVaw0wAxWIpmdHjJFKQ1qm4FIu&data=04%7C01%7Ceugenio.villasante%40uniglobalunion.org%7Ce501319943174e733a7c08d91a976556%7C8359b2e0aed64063acb178f9effecd0a%7C0%7C0%7C637570059807764454%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=GOvC7hkX7zk58Kx8TRAIECYpzjIRha%2F55RmCQ%2BdGvi4%3D&reserved=0) the warehouse workers’ struggle.

### Contention 2 is the Environment

#### Ozone is improving in the status quo

**UN 19**, United Nations Report, 9-16-2019, "Ozone on track to heal completely in our lifetime, UN environment agency declares on World Day.," UN News, <https://news.un.org/en/story/2019/09/1046452> Livingston RB

The phaseout of controlled uses of ozone-depleting substances has not only helped replenish the protective layer for future generations but is also helping guard human health by filtering harmful rays from reaching Earth, said [UNEP](https://www.unep.org/) shared in a[statement](https://ozone.unep.org/ozone-day/32-years-and-healing). The recognition of this success comes on [World Ozone Day,](https://www.un.org/en/events/ozoneday/) marked 16 September. This year celebrates “32 Years and Healing”; a commemoration of the international commitment to protect the ozone later and the climate under the historic [Montreal Protocol](https://ozone.unep.org/sites/default/files/2019-08/MP_Handbook_2019_0.pdf), which has led to the phase-out of 99 per cent of ozone-depleting chemicals in refrigerators, air-conditioners and other consumer products. **Since 2000**, parts of **the ozone** layer **have recovered at a rate of 1-3 per cent** every ten years, the latest [Scientific Assessment of Ozone Depletion](https://www.esrl.noaa.gov/csd/assessments/ozone/2018/)estimates. At projected rates the “**Northern Hemisphere and mid-latitude ozone will heal completely by the 2030’s**”, UNEP said, with the Southern Hemisphere repaired by the 2050’s, and Polar Regions in the following decade. UN Secretary-General, António Guterres [said](https://www.unenvironment.org/news-and-stories/statement/secretary-generals-message-world-ozone-day-2019) “**we must be careful not to neglect the ozone layer**,” as we “rightly focus our energies on tackling climate change”, spotlighting the importance of preventing threats posed by emission of ozone-depleting gases**. Regenerating the ozone has helped curb the effects of climate change** - with approximately 135 billion tonnes of carbon dioxide emissions from 1990 to 2010 averted by a strong protective shield.

#### Space launches are rapidly increasing now – commercialization destroys the ozone layer

Marais 21 Eloise Marais 7-19-2021 "Space tourism: rockets emit 100 times more CO₂ per passenger than flights – imagine a whole industry" <https://theconversation.com/space-tourism-rockets-emit-100-times-more-co-per-passenger-than-flights-imagine-a-whole-industry-164601> (Associate Professor in Physical Geography, UCL) //Jia Recut

The commercial race to get tourists to space is heating up between Virgin Group founder Sir Richard Branson and former Amazon CEO Jeff Bezos. On Sunday 11 July, Branson ascended 80 km to reach the edge of space in his piloted Virgin Galactic VSS Unity spaceplane. Bezos’ autonomous Blue Origin rocket is due to launch on July 20, coinciding with the anniversary of the Apollo 11 Moon landing. Though Bezos loses to Branson in time, he is set to reach higher altitudes (about 120 km). The launch will demonstrate his offering to very wealthy tourists: the opportunity to truly reach outer space. Both tour packages will provide passengers with a brief ten-minute frolic in zero gravity and glimpses of Earth from space. Not to be outdone, Elon Musk’s SpaceX will provide four to five days of orbital travel with its Crew Dragon capsule later in 2021. What are the environmental consequences of a space tourism industry likely to be? Bezos boasts his Blue Origin rockets are greener than Branson’s VSS Unity. The Blue Engine 3 (BE-3) will launch Bezos, his brother and two guests into space using liquid hydrogen and liquid oxygen propellants. VSS Unity used a hybrid propellant comprised of a solid carbon-based fuel, hydroxyl-terminated polybutadiene (HTPB), and a liquid oxidant, nitrous oxide (laughing gas). The SpaceX Falcon series of reusable rockets will propel the Crew Dragon into orbit using liquid kerosene and liquid oxygen. Burning these propellants provides the energy needed to launch rockets into space while also generating greenhouse gases and air pollutants. Large quantities of water vapour are produced by burning the BE-3 propellant, while combustion of both the VSS Unity and Falcon fuels produces CO₂, soot and some water vapour. The nitrogen-based oxidant used by VSS Unity also generates nitrogen oxides, compounds that contribute to air pollution closer to Earth. Roughly two-thirds of the propellant exhaust is released into the stratosphere (12 km-50 km) and mesosphere (50 km-85 km), where it can persist for at least two to three years. The very high temperatures during launch and re-entry (when the protective heat shields of the returning crafts burn up) also convert stable nitrogen in the air into reactive nitrogen oxides. These gases and particles have many negative effects on the atmosphere. In the stratosphere, nitrogen oxides and chemicals formed from the breakdown of water vapour convert ozone into oxygen, depleting the ozone layer which guards life on Earth against harmful UV radiation. Water vapour also produces stratospheric clouds that provide a surface for this reaction to occur at a faster pace than it otherwise would. Space tourism and climate change Exhaust emissions of CO₂ and soot trap heat in the atmosphere, contributing to global warming. Cooling of the atmosphere can also occur, as clouds formed from the emitted water vapour reflect incoming sunlight back to space. A depleted ozone layer would also absorb less incoming sunlight, and so heat the stratosphere less. Figuring out the overall effect of rocket launches on the atmosphere will require detailed modelling, in order to account for these complex processes and the persistence of these pollutants in the upper atmosphere. Equally important is a clear understanding of how the space tourism industry will develop. Virgin Galactic anticipates it will offer 400 spaceflights each year to the privileged few who can afford them. Blue Origin and SpaceX have yet to announce their plans. But globally, rocket launches wouldn’t need to increase by much from the current 100 or so performed each year to induce harmful effects that are competitive with other sources, like ozone-depleting chlorofluorocarbons (CFCs), and CO₂ from aircraft. During launch, rockets can emit between four and ten times more nitrogen oxides than Drax, the largest thermal power plant in the UK, over the same period. CO₂ emissions for the four or so tourists on a space flight will be between 50 and 100 times more than the one to three tonnes per passenger on a long-haul flight. In order for international regulators to keep up with this nascent industry and control its pollution properly, scientists need a better understanding of the effect these billionaire astronauts will have on our planet’s atmosphere.

#### The Private Space Industry is showing enormous increase in launches – that causes pollutants and warming – with massive amounts of chemicals entering the upper atmosphere.

Gammon 21 Katharine Gammon 7-19-2021 "How the billionaire space race could be one giant leap for pollution" <https://www.theguardian.com/science/2021/jul/19/billionaires-space-tourism-environment-emissions> (I’m an award-winning independent science journalist based in Santa Monica, California. My interests range from culture and nature in public lands to the lives of scientists to the complexity of baby brains. Before I became a professional journalist, I served in the Peace Corps in Bulgaria, and attended MIT and Princeton University.)//Jia Recut

Last week Virgin Galactic took Richard Branson past the edge of space, roughly 86 km up – part of a new space race with the Amazon billionaire Jeff Bezos, who aims to make a similar journey on Tuesday. Both very wealthy businessmen hope to vastly expand the number of people in space. “We’re here to make space more accessible to all,” said Branson, shortly after his flight. “Welcome to the dawn of a new space age.” Already, people are buying tickets to space. Companies including SpaceX, Virgin Galactic and Space Adventures want to make space tourism more common. The Japanese billionaire Yusaku Maezawa spent an undisclosed sum of money with SpaceX in 2018 for a possible future private trip around the moon and back. And this June, an anonymous space lover paid $28m to fly on Blue Origin’s New Shepard with Bezos – though later backed out due to a “scheduling conflict”. But this launch of a new private space industry that is cultivating tourism and popular use could come with vast environmental costs, says Eloise Marais, an associate professor of physical geography at University College London. Marais studies the impact of fuels and industries on the atmosphere. When rockets launch into space, they require a huge amount of propellants to make it out of the Earth’s atmosphere. For SpaceX’s Falcon 9 rocket, it is kerosene, and for Nasa it is liquid hydrogen in their new Space Launch System. Those fuels emit a variety of substances into the atmosphere, including carbon dioxide, water, chlorine and other chemicals. The carbon emissions from rockets are small compared with the aircraft industry, she says. But they are increasing at nearly 5.6% a year, and Marais has been running a simulation for a decade, to figure out at what point will they compete with traditional sources we are familiar with. “For one long-haul plane flight it’s one to three tons of carbon dioxide [per passenger],” says Marais. For one rocket launch 200-300 tonnes of carbon dioxide are split between 4 or so passengers, according to Marais. “So it doesn’t need to grow that much more to compete with other sources.” Right now, the number of rocket flights is very small: in the whole of 2020, for instance, there were 114 attempted orbital launches in the world, according to Nasa. That compares with the airline industry’s more than 100,000 flights each day on average. But emissions from rockets are emitted right into the upper atmosphere, which means they stay there for a long time: two to three years. Even water injected into the upper atmosphere – where it can form clouds – can have warming impacts, says Marais. “Even something as seemingly innocuous as water can have an impact.” Closer to the ground, all fuels emit huge amounts of heat, which can add ozone to the troposphere, where it acts like a greenhouse gas and retains heat. In addition to carbon dioxide, fuels like kerosene and methane also produce soot. And in the upper atmosphere, the ozone layer can be destroyed by the combination of elements from burning fuels. “While there are a number of environmental impacts resulting from the launch of space vehicles, the depletion of stratospheric ozone is the most studied and most immediately concerning,” wrote Jessica Dallas, a senior policy adviser at the New Zealand Space Agency, in an analysis of research on space launch emissions published last year. Another report from 2019 penned by the Center for Space Policy and Strategy likened the space emissions problem to that of space debris, which the authors say creates an existential risk to the industry. “Today, launch vehicle emissions present a distinctive echo of the space debris problem. Rocket engine exhaust emitted into the stratosphere during ascent to orbit adversely impacts the global atmosphere,” they wrote. “We just don’t know how large the space tourism industry could become,” says Marais. A new market report estimates that the global suborbital transportation and space tourism market is estimated to reach $2.58bn in 2031, growing 17.15% each year of the next decade. “The major driving factor for the market’s robustness will be focused efforts to enable space transportation, emerging startups in suborbital transportation, and increasing developments in low-cost launching sites,” the report says. In the past, most space transportation has been focused on cargo supply missions to the International Space Station and satellite launch services, but currently, this focus has shifted to in-space transportation, planetary explorations, crewed missions, suborbital transportation and space tourism. Several companies, including SpaceX, Blue Origin and Virgin Galactic, have been focusing on developing platforms such as rocket-powered suborbital vehicles that will enable the industry to carry out suborbital transportation and space tourism. People have pointed out that the money these billionaires have poured into space technology could be invested in making life better on our planet, where wildfires, heatwaves and other climate disasters are becoming more frequent as the globe warms up in the climate crisis. “Is anyone else alarmed that billionaires are having their own private space race while record-breaking heatwaves are sparking a ‘fire-breathing dragon of clouds’ and cooking sea creatures to death in their shells?” the former US Labor Secretary Robert Reich tweeted last week. Marais says that there is always an element of excitement to new developments in space – but it’s still possible to be responsible while doing something exciting. She urges caution as the space tourism industry grows, and says there are currently no international rules around the kinds of fuels used and their impact on the environment. “We have no regulations currently around rocket emissions,” she says. “The time to act is now – while the billionaires are still buying their tickets.”

#### Climate change disproportionately impacts minority communities, destroying homes, shelters, and stable living conditions. It is the epitome of structural oppression.

**Carmin Chappell 17** [Carmin Chappell. . “Climate change in the US will hurt poor people the most, according to a bombshell federal report”. 10-5-2017. CNBC. https://www.cnbc.com/2018/11/26/climate-change-will-hurt-poor-people-the-most-federal-report.html. Accessed 12-27-2021]//Jia

Climate change will hit low-income communities the hardest as it takes a toll on the U.S. in general, says a blockbuster government report released on Friday. Low-income communities in both urban and rural areas will be disproportionately impacted by climate change relative to other communities, according to the assessment, which was created by a team of over 300 experts from the government and the private sector to analyze the impact of climate change on the country. Those communities already have higher rates of many adverse health conditions, are more exposed to environmental hazards and take longer to bounce back from natural disasters. These existing inequalities will only be exacerbated due to climate change, according to the report, which is known as the Fourth National Climate Assessment. We need to take climate change seriously, Richard Branson says The report made waves in Washington despite being released the day after Thanksgiving, which prompted speculation that the Trump administration was trying to bury the findings. The assessment is at odds with the views of President Donald Trump, who has historically denied evidence of climate change. Last year, he announced that the U.S. would withdraw from the Paris Agreement, which aims to reduce global greenhouse gas emissions. Earlier this month, he tweeted, “Brutal and Extended Cold Blast could shatter ALL RECORDS – Whatever happened to Global Warming?” On Monday, Trump rejected the report’s findings about climate change’s economic impact. “I don’t believe it,” he told reporters on the White House South Lawn, as he was departing to hold campaign rallies in Mississippi. Several politicians seized on the report’s release as an opportunity to promote their own plans for mitigating climate change. On Twitter, Alexandria Ocasio-Cortez, a Democrat who was elected to represent part of New York City in Congress, touted her Green New Deal proposal, which aims to create a committee in the House that would develop a plan to generate all of the country’s electricity from renewable energy. “People are going to die if we don’t start addressing climate change ASAP,” she said in the tweet. Sen. Elizabeth Warren, a potential 2020 Democratic presidential candidate, also tweeted about the Climate Risk Disclosure Act she introduced in September, which would require publicly traded companies to disclose their greenhouse gas emissions. Health and jobs at risk Heart and lung disease, heat stroke and bacterial infections are just a few of the health consequences associated with climate change. Low-income populations “typically have less access to information, resources, institutions, and other factors to prepare for and avoid the health risks of climate change,” the report says, leaving them especially vulnerable. Lack of health insurance among the poor will also intensify the risks of illnesses caused by climate change. In urban areas, which produce 80 percent of greenhouse gas emissions in North America, the poor “live in neighborhoods with the greatest exposure to climate and extreme weather events,” the report says. This includes living near pollution sites and in housing developments without sufficient insulation or air conditioning. Additionally, disruptions to infrastructure during natural disasters can have an outsized impact on city residents who rely on public transportation. Rural areas often have agriculture-dependent economies, so the livelihoods of low-income residents are more vulnerable to changing environmental conditions. Many rural households also suffer from energy poverty, the report states, meaning they “are not able to adequately heat or provide other required energy services in their homes at affordable cost.” As average temperatures continue to rise, people who cannot affordably cool their houses will continue to feel financial strains. Disasters and ‘green gentrification’ Recent storms like Hurricane Florence and Hurricane Harvey, which brought record levels of flooding to coastal areas, also exposed inequities in disaster preparedness as poorer communities struggled to rebuild. “Some property owners can afford to modify their homes to withstand current and projected flooding and erosion impacts,” write the report’s authors. “Others who cannot afford to do so are becoming financially tied to houses that are at greater risk of annual flooding.” Even climate change prevention efforts can reflect existing inequalities, according to the assessment. “Better-resourced communities have created climate offices and programs, while response has lagged in smaller or poorer communities,” the report says. Infrastructure improvements to protect against climate change can lead to what the report calls “green gentrification,” in which property values rise and low-income residents are pushed out. To combat these inequalities, the report emphasizes the need for government officials to involve residents when developing solutions to climate change. “Decisions about where to prioritize physical protections, install green infrastructure, locate cooling centers, or route public transportation,” should be made with low-income communities in mind, according to the report.