### 1AC---Plan

#### Resolved: The appropriation of celestial bodies by private entities is unjust.

### 1AC---Advantage

#### Private entities are driving the race to colonize space---without them race doesn’t happen

Piper 18 [Kelsey Piper, writing team at Triplebyte 10-22-2018, "Jeff Bezos and Elon Musk want to colonize space to save humanity," Vox, https://www.vox.com/future-perfect/2018/10/22/17991736/jeff-bezos-elon-musk-colonizing-mars-moon-space-blue-origin-spacex]/ISEE

The Intergovernmental Panel on Climate Change warns us that climate change could be shaping up to be even more catastrophic than we feared. Too many world governments are still armed with nuclear weapons that they’ve nearly deployed by accident on occasion. We’re unprepared for pandemics, and technological advancement is bringing within reach new threats to our world. So do we need a backup plan? Or a backup planet? Jeff Bezos and Elon Musk both seem to think so. Elon Musk famously founded SpaceX because he was frustrated NASA wasn’t getting us to Mars fast enough, and was left worried there was no second chance for humanity. Bezos, too, is worried that Earth will run out of resources, and that by the time we realize we need the infrastructure to get off-planet it’ll be too late to build it. He’s spent his personal fortune on BlueOrigin, which will begin commercial spaceflight next year. He prefers the Moon as a first target. Unlike Musk, he’s not focused on self-sufficient colonies that could survive the destruction of Earth, but on using the resources in space to try to dig us out of our problems here at home. These proposals have been roundly criticized for their seeming elitism, working on a life raft for the few while most people are left to die. (Musk contests that, saying that it’ll be adventurous people, not elite ones, who populate Mars, and Bezos is emphatic that “we go to space to save the Earth.”) I was interested in another angle: Would this even work? If you have a few billion dollars to throw at the problem of getting humanity through the next centuries alive, is space colonization a reasonable place to spend it? Cosmologist Martin Rees at Cambridge University just published a book about existential threats to our world. When Vox’s Sean Illing sat down for an interview with him, he asked whether humanity would need to move beyond the Earth to survive. Rees was fine with private companies exploring space, but was emphatically opposed to the idea that colonization could save us: “I think that’s a dangerous delusion because Mars will be a more hostile environment than the top of Everest or the South Pole, and dealing with climate change here on Earth is far more important than terraforming Mars.” That was a recurring theme in my conversations with experts. Earth is in trouble, but space is deeply inhospitable to humans. And even the worst catastrophes are unlikely to leave this world as hostile to humanity as a planet with no life, no atmosphere, limited gravity, and little water. Nothing we find on Mars or the Moon is likely to be our salvation in a disaster. If we want to keep humanity alive, there are better places for Bezos, Musk, and anyone else afraid for the future of our species to spend their money.

#### Defense---

#### Space cols impossible---resources and planet conditions

Dvorsky 19 [George Dvorsky is a senior staff reporter at Gizmodo specializing in astronomy, space exploration, SETI, archaeology, bioethics, animal intelligence, human enhancement, and risks posed by AI and other advanced tech, 7/30/19, accessed 11/23/21, “Humans Will Never Colonize Mars”, https://gizmodo.com/humans-will-never-colonize-mars-1836316222]AGabay

The Red Planet is a **cold**, **dead place**, with an atmosphere about **100 times thinner** than Earth’s. The paltry amount of air that does exist on Mars is primarily composed of noxious carbon dioxide, which does little to **protect** the surface from the **Sun’s** harmful **rays**. Air pressure on Mars is very low; at 600 Pascals, it’s only about 0.6 percent that of Earth. You might as well be exposed to the vacuum of space, resulting in a severe form of the bends—including ruptured lungs, dangerously swollen skin and body tissue, and ultimately **death**. The thin atmosphere also means that heat cannot be retained at the surface. The average temperature on Mars is -81 degrees Fahrenheit (-63 degrees Celsius), with temperatures dropping as low as -195 degrees F (-126 degrees C). By contrast, the coldest temperature ever recorded on Earth was at Vostok Station in Antarctica, at -128 degrees F (-89 degrees C) on June 23, 1982. Once temperatures get below the -40 degrees F/C mark, people who aren’t properly dressed for the occasion can expect hypothermia to set in within about five to seven minutes. Mars also has less mass than is typically appreciated. Gravity on the Red Planet is 0.375 that of Earth’s, which means a 180-pound person on Earth would weigh a scant 68 pounds on Mars. While that might sound appealing, this low-gravity environment would likely wreak **havoc** to human health in the long term, and possibly have negative impacts on human **fertility**. Yet despite these and a plethora of other issues, there’s this popular idea floating around that we’ll soon be able to set up colonies on Mars with ease. SpaceX CEO Elon Musk is projecting colonies on Mars as early as the 2050s, while astrobiologist Lewis Darnell, a professor at the University of Westminster, has offered a more modest estimate, saying it’ll be about 50 to 100 years before “substantial numbers of people have moved to Mars to live in self-sustaining towns.” The United Arab Emirates is aiming to build a Martian city of 600,000 occupants by 2117, in one of the more ambitious visions of the future. Sadly, this is literally science fiction. While there’s no doubt in my mind that humans will eventually visit Mars and even build a base or two, the notion that we’ll soon set up colonies inhabited by hundreds or thousands of people is pure **nonsense**, and an unmitigated denial of the tremendous challenges posed by such a prospect. Pioneering astronautics engineer Louis Friedman, co-founder of the Planetary Society and author of Human Spaceflight: From Mars to the Stars, likens this unfounded enthusiasm to the unfulfilled visions proposed during the 1940s and 1950s. “Back then, cover stories of magazines like Popular Mechanics and Popular Science showed colonies under the oceans and in the Antarctic,” Friedman told Gizmodo. The feeling was that humans would find a way to occupy every nook and cranny of the planet, no matter how challenging or inhospitable, he said. “But this just hasn’t happened. We make occasional visits to Antarctica and we even have some bases there, but that’s about it. Under the oceans it’s even worse, with some limited human operations, but in reality it’s really very, very little.” As for human colonies in either of these environments, not so much. In fact, not at all, despite the relative ease at which we could achieve this. After the Moon landings, Friedman said he and his colleagues were hugely optimistic about the future, believing “we would do more and more things, such as place colonies on Mars and the Moon,” but the “fact is, no human spaceflight **program**, whether Apollo, the Space Shuttle Program, or the International Space Station,” has established the necessary **groundwork** for setting up colonies on Mars, such as building the required **infrastructure**, finding **safe** and **viable ways** of **sourcing food** and **water**, mitigating the deleterious effects of **radiation** and **low gravity**, among other issues. Unlike other fields, development into human spaceflight, he said, “has become static.” Friedman agreed that we’ll likely build bases on Mars, but the “evidence of history” suggests colonization is **unlikely** for the foreseeable future. Neuroscientist Rachael Seidler from the University of Florida says many people today fail to appreciate how difficult it’ll be to sustain colonies on the Red Planet. “People like to be optimistic about the idea of colonizing Mars,” Seidler, a specialist in motor learning and the effects of microgravity on astronauts, told Gizmodo. “But it also sounds a bit pie-in-the-sky,” she said. “A lot of people approach it as thinking we shouldn’t limit ourselves based on practicalities, but I agree, there are a lot of potential negative physiological **consequences**.” Seidler said NASA and other space agencies are currently working very hard to create and test countermeasures for the various negative impacts of living on Mars. For example, astronauts on the ISS, who are subject to tremendous muscle and bone loss, try to counteract the effects by doing strength and aerobic training while up in space. As for treating the resulting negative health impacts, whether caused by long-duration stays on the ISS or from long-term living in the low-gravity environment of Mars, “we’re not there yet,” said Seidler. In his latest book, On the Future: Prospects for Humanity, cosmologist and astrophysicist Martin Rees addressed the issue of colonizing Mars rather succinctly: By 2100 thrill seekers... may have established ‘bases’ independent from the Earth—on Mars, or maybe on asteroids. Elon Musk (born in 1971) of SpaceX says he wants to die on Mars—but not on impact. But don’t ever expect mass **emigration** from Earth. And here I disagree strongly with Musk and with my late Cambridge colleague Stephen Hawking, who enthuse about rapid build-up of large-scale Martian communities. It’s a dangerous delusion to think that space offers an escape from Earth’s problems. We’ve got to solve these problems here. Coping with climate change may seem daunting, but it’s a doddle compared to **terraforming Mars**. No place in our solar system offers an environment even as clement as the Antarctic or the top of Everest. There’s no ‘**Planet B**’ for ordinary risk-averse people. Indeed, there’s the whole terraforming issue to consider. By terraforming, scientists are referring to the hypothetical prospect of **geoengineering** a planet to make it habitable for humans and other life. For Mars, that would mean the injection of **oxygen** and other **gases** into the atmosphere to raise surface temperature and air pressure, among other interventions. A common argument in favor of colonizing Mars is that it’ll allow us to begin the process of transforming the planet to a **habitable state**. This scenario has been tackled by a number of science fiction authors, including Kim Stanley Robinson in his acclaimed Mars Trilogy. But as Friedman told Gizmodo, “that’s thousands of years in the making at least.” Briony Horgan, assistant professor of planetary science at Purdue University, said Martian terraforming is a **pipedream**, a prospect that’s “way beyond any kind of **technology** we’re going to have **any time soon**,” she told Gizmodo. When it comes to terraforming Mars, there’s also the logistics to consider, and the materials available to the geoengineers who would dare to embark upon such a multi-generational project. In their 2018 Nature paper, Bruce Jakosky and Christopher Edwards from the University of Colorado, Boulder sought to understand how much carbon dioxide would be needed to increase the air pressure on Mars to the point where humans could work on the surface without having to wear pressure suits, and to increase temperature such that liquid water could exist and persist on the surface. Jakosky and Edwards concluded that there’s not nearly enough CO2 on Mars required for **terraforming**, and that future geoengineers would have to somehow import the required gases to do so.

#### No continuous supply of materials mean that colonies wont last long term

Levchenko et al. 19 [Professors in the Plasma Sources and Applications Centre/Space Propulsion Centre, NIE, Nanyang Technological University. 2019. “Mars Colonization: Beyond Getting There.” Global Challenges, vol. 3, no. 1.]

Settlement of Mars—is it a dream or a necessity? From scientific publications to public forms, there is certainly little consensus on whether colonization of Mars is necessary or even possible, with a rich diversity of opinions that range from categorical It is a necessity!20 to equally categorical Should Humans Colonize Other Planets? No.21 A strong proponent of the idea, Orwig puts forward five reasons for Mars colonization, implicitly stating that establishing a permanent colony of humans on Mars is no longer an option but a real necessity.20 Specifically, these arguments are: Survival of humans as a species; Exploring the potential of life on Mars to sustain humans; Using space technology to positively contribute to our quality of life, from health to minimizing and reversing negative aspects of anthropogenic activity of humans on Earth; Developing as a species; Gaining political and economic leadership. The first argument captures the essence of what most space colonization proponents feel—our ever growing environmental footprint threatens the survival of human race on Earth. Indeed, a large body of evidence points to human activity as the main cause of extinction of many species, with shrinking biodiversity and depleting resources threatening the very survival of humans on this planet. Colonization of other planets could potentially increase the probability of our survival. While being at the core of such ambitious projects as Mars One, a self‐sustained colony of any size on Mars is hardly feasible in the foreseeable future. Indeed, sustaining even a small number of colonists would require a continuous supply of food, oxygen, water and basic materials. At this stage, it is not clear whether it would be possible to establish a system that would generate these resources locally, or whether it would at least in part rely on the delivery of these resources (or essential components necessary for their local production) from Earth. Beyond the supply of these very basic resources, it would be quite challenging if not impossible for the colonists to independently produce hi‐tech but vitally important assets such as medicines, electronics and robotics systems, or advanced materials that provide us with a decent quality of life. In this case, would their existence become little more than the jogtrot of life, as compared with the standards expected at the Earth?22

#### Radiation, bone loss, and no reproduction---makes space colonies unsustainable and unlivable

**Szocik et al., 18** (Konrad Szocik, University of Information Technology and Management in Rzeszow, Department of Philosophy and Cognitive Science, Rafael E. Marques, Steven Abood, Aleksandra Kedzior, Kateryna Lysenko-Ryba, Dobrochna Minich, June 2018, accessed on 12-19-2021, Futures, "Biological and social challenges of human reproduction in a long-term Mars base", https://www.sciencedirect.com/science/article/abs/pii/S0016328717300137, HBisevac)

Pregnancy is the **sole mean** of human reproduction, and is **key** to long-term colonization of Mars. Unfortunately, pregnancy is **risky** and may pose **serious hazards** to women’s **health**, especially in an **extraterrestrial environment**. Deep-space missions require astronauts to be at **peak physical condition** and **perfect health** (Crucian et al., 2016; Hackney et al., 2015). During travel, astronauts may experience motion sickness, headaches, body pain, diseases and genitourinary problems, among several other pathologies (Ertl et al., 2002; Rummel, Michel, Sawin, & Buderer, 1976). On their return to Earth, astronauts stationed at the ISS presented with muscle and bone loss (Chang et al., 2016), immunosuppression (Mukhopadhyay et al., 2016) and even temporary blindness (Zwart et al., 2016), which required astronauts to recover for months. **Microgravity** has been described as an inducer of **significant changes** in the **cardiovascular system** of astronauts both during and after flight (Otsuka et al., 2016). Changes in the nervous system, hearing and eyesight are also significant and related to the physiological adaptation/stress to microgravity (Cassady et al., 2016; Ertl et al., 2002; Strewe et al., 2012). The life-supporting environment of a Martian colony won’t facilitate astronaut recovery to a necessary healthy status, and is likely to require the most of astronauts’ physical capacities. Mars gravity is 0.38g (Lacquaniti et al., 2017), which indicates that astronauts will remain in hypogravity for the whole mission, or lifetime. Without the opportunity to return to an environment at 1 g (Earth gravity), we assume that most astronauts will **never recover** to a pre-journey healthy state, and may have to adapt to new parameters of health and well-being, as made possible in the Mars colony infrastructures. Moreover, astronauts will have to tolerate **lower oxygen tension** (Fogg 1995) and the risk of chronic exposure to **radiation**. NASA’s human habitats on Mars are being designed to prevent or mitigate most of the health hazards associated with long-duration missions, and are invested with new technologies for health monitoring and diagnostics, in association with exercise systems (NASA’s Journey to Mars – Pioneering Next Steps in Space Exploration, 2015). Other governmental and private enterprises have not detailed their efforts to maintain a healthy environment for astronauts, and have focused on the primordial aspect of transporting the first colonizers to Mars and providing a minimal environment compatible with human life. Overall, it is unknown how pregnancy would be influenced by microgravity symptoms, for better or worse.

The aspects of Martian life that could influence the process of reproduction are **many** (Urbaniak & Reid, 2016). For instance, it is not known if **reduced gravity** would affect the **production of reproductive cells** in both males or females, or the **success rate of fertilization** (Jones, Jennings, Pietryzk, Ciftcioglu, & Stepaniak, 2005). The effects of reduced gravity on the embryonic development and delivery are also unknown (Urbaniak & Reid, 2016). **Radiation** is known to be **deleterious** for adults and especially for **reproductive cells**, **developing embryos** and **fetuses**, and is already considered a **major health hazard** to astronauts (Northum, Guetersloh, Braby, & Ford, 2015; Shirazi-Fard, Alwood, Schreurs, Castillo, & Globus, 2015).

#### Scenario One---*X Risks*

#### Trying for spacecol causes extinction---locks-in dozens of new X-risks

**Deudney, 20** [Daniel Deudney, is Associate Professor of Political Science, Johns Hopkins University, 2020, accessed on 12-18-2021, Oxford University Press, "Dark Skies: Space Expansionism, Planetary Geopolitics, and the Ends of Humanity" 362-62, https://oxford.universitypressscholarship.com/view/10.1093/oso/9780190903343.001.0001/oso-9780190903343]HBisevac

This **dark scenario** of solar **space expansion** produced by the application of **geopolitical theory** has profound implications for the argument that colonization of other bodies in the solar system is necessary to **alleviate** or escape the **formidable catastrophic** and **existential risks** facing **Earth-bound humanity**. Both riskologists and space expansionists strongly believe, with Hawking, that “once we establish independent colonies, our entire future will be safe.”25 If all humanity’s eggs are in one fraying and vulnerable basket, then it stands to reason that spreading viable colonies of humans to other celestial bodies will help ensure the survival of the human species. While the role of existing space capabilities in amplifying the (p.357) dangers of the great technogenic threat of nuclear war belies the astro-optimism of space advocates, what of their cherished larger vision of making humanity a multiworld species? While space advocates propose a variety of ways space expansion might alleviate or escape existing risks, they give almost no attention to whether expansion might generate **new risks** or help **re-activate already regulated ones**. The list of major threats facing humanity is dauntingly long, and the expansionist agenda for solar space has many parts, making assessment a complex undertaking. But there are **six major ways** in which the realization of the space expansionist agenda for solar orbital space is likely to **generate** or activate **catastrophic and existential risks**. Taken in combination these arguments provide a strong basis for putting ambitious space expansion on the list of megathreats potentially confronting humanity, and for making every effort to relinquish it. Large-scale space expansion must be viewed as something akin to a full-scale **nuclear war** and assiduously avoided. Unlike many of the other threats humanity faces, addressing those created by ambitious space expansion is now extremely simple: **just say no**. Large-scale solar space expansion will produce a radically novel political and material landscape that is extremely inauspicious for **security**, freedom, and **human survival**, a perfect storm of unfavorable possibilities and tendencies. With a new word for a new phenomenon, borrowed from astrology for a conjunction of negatives, solar space patterns can be characterized as geopolitically malefic. Just as the space environment creates terrestrially inconceivable extremes of frigid and torrid temperatures on opposite sides of the same object, so too the prospective solar landscape combines geopolitical extremes in ways unknown to terrestrial experience. Most ominously, solar space geopolitics combines the extreme diversities and high effective distances experienced on Archipelago Earth with system-wide levels of intense violence interdependence found on Planetary Earth. Polities will be extremely different and spatiotemporally remote but will be capable of readily inflicting **massive levels of destruction** on one another. Add shifting distribution, wide accessibility, and low distinctiveness, and the contours of the violence-material landscape becomes **even more prone** to **large-scale destruction**. With system-wide common government and mutual restraints very difficult to **create** and **sustain**, solar space comes close to being **maximally suboptimal for positive outcomes**, a nightmarish worst of all possible worlds in **geopolitical conjunction**. Extensive mutual restraints will be vitally necessary, but they will be nearly impossible to realize. While humanity’s (p.358) eggs might be scattered among many baskets, egg-smashing with large rocks will be easy—and likely. Facing this extensive list of major factors disposing the system toward large-scale violent conflict in solar space will require humanity’s transmutation into Tsiolkovskian angels to avoid catastrophic and existentially threatening warfare. Perhaps the only saving grace of this key conclusion of geopolitical analysis is that the demons loosened by opening the Pandora’s box of space colonization might start to wreak their damage early enough to throttle the colonial enterprise before it gets too fatally under way. A second way in which colonizing solar space poses catastrophic and existential threats is through **natural threat amplification**. Because **asteroids** and **comets** collide with the Earth, and the **total energy** contained within the population of near-Earth objects **vastly exceeds** that contained in all **nuclear arsenals**, they pose the inevitable prospect of **terrestrial calamities**. The rate at which these objects strike the Earth is now solely a function of natural forces. Space expansionists advance human movement into space to **avert** this threat and promote their (p.359) solution to this problem as a principal space contribution to **reducing** catastrophic and existential threats. But because the technologies to divert away from the Earth are essentially identical to those needed to direct objects toward the Earth, the rate at which these objects strike the Earth could **increase** if they become **instruments of interstate rivalry** and become **weaponized** as **planetoid bombs**. This prospect leads Sagan to recommend delaying the full mapping of asteroid orbits and development of diversion techniques until after some form of effective world government has been established on Earth. But with the spread of colonies across the solar system, the writ of any government on Earth will be severely limited. The same anarchical political configurations that Sagan views as incompatible with security from intentional asteroid bombardment on Earth will almost certainly be reproduced on a vastly larger, and more severe, scale in the Solar Archipelago. If, as seems extremely likely, systemic anarchy returns with the diaspora of humans across the solar system, then militarized rivalries are very likely to ensue, producing asteroidal weaponization. If this happens, a natural threat will have been amplified, enlarging the potential for the occurrence of a catastrophic event. The third way in which ambitious space expansion could increase the catastrophic and existential risks confronting humanity is through **restraint reversal**. Barring civilizational collapse, the cornucopia of technological innovation will continue to **pour forth** its prodigies. If the monstrosities and menaces of the ever-widening technological cone of possibility can be thwarted only by staying within a narrow path of human preservation and enhancement, then space expansion must be assessed for its effects on the reversals, regulations, and relinquishments constituting the barriers of restraint. The record with nuclear weapons demonstrates that institutional architectures of restraint are not easy to erect and sustain on Earth. If space expansion makes the creation and preservation of restraints even more difficult, the probability of otherwise unrelated catastrophic and existential outcomes will rise, making it a potent **catalyst for multisided disaster**. Instead of mitigating the effects of multiple catastrophic and existential risks, large-scale space expansion promises to **multiply them**. There are many reasons to anticipate that restraints established on Earth will be reversed if space colonization occurs. Restraints are **unlikely to survive** transplantation into diverse and demanding off-world environments. If humans are living on multiple worlds subject to different governments, regulation and relinquishment will be more difficult to establish, there will be more places for potential breakdowns, and verification of compliance will be **vastly more difficult**. If, as seems extremely likely, the many different worlds in the Solar Archipelago in systemic anarchy have violently hostile relations, establishing and sustaining restraints will become nearly impossible. Surveillance in the vast reaches of solar space will be vastly difficult. And if the human species radiates into multiple (p.360) species, the barriers to regulation and relinquishment will become even more formidable. A particularly **dangerous case** of restraint reversal may be technologies leading to **a**rtificial super**i**ntelligence, a particularly potent technogenic threat. Space activities are already heavily dependent on advanced **computing** and robotic technologies, and peoples living in space are likely to be far more cyber-dependent than those on Earth. Living in harshly inhospitable environments, spacekind will have strong incentives to push the development of **cybernetic capabilities**. If a robust regime for the restraint and relinquishment of ASI is not established, human extinction might occur before significant space colonization occurs. If an effective ASI-restraint regime is developed on Earth before extensive space colonization takes place, it seems unlikely that such restraints would survive the expansion of humanity across the solar system. It might be objected that the breakout of an ASI in some remote world in solar space would not pose a general existential threat to humanity once all of humanity’s eggs are no longer in one basket. If, however, we take seriously the standard scenarios of what an ASI would do once it emerges, the dispersion of humanity across multiple worlds would afford **no protection** whatsoever because an **uncontrolled A**S**I**, it is widely anticipated, will in short order expand not just on the planet of its origins but **across the solar system**, indeed the galaxy.[26](https://oxford-universitypressscholarship-com.offcampus.lib.washington.edu/view/10.1093/oso/9780190903343.001.0001/oso-9780190903343-chapter-10#oso-9780190903343-miscMatter-9-note-818) To the extent uncontrolled ASI is deemed something to avoid at all costs, large-scale space expansion must be viewed similarly. Terrestrial arrangements to restrain **nuclear, genetic, and nanotech**nologies are also likely to be **reversed** as humanity expands to other worlds. The prospects of interworld and interspecies wars will provide large incentives for maintaining weaponized nuclear capabilities and for pursuing research into military genetic and nanotechnology applications. Any restraint regime for genetic technologies is unlikely to survive extensive human expansion into space, given the attractiveness of directed and **accelerated species alteration** in off-worlds. Solar space contains a vast number of islands for potential Doctors Moreau to work their alchemy, as memorably envisioned in Robinson’s 2312. If self-replicating nanomachines are possible and built on Earth, human existence will be threatened. But if a relinquishment regime is established on Earth, it is unlikely to survive in a solar diaspora. While interplanetary distances will afford a buffer from runaway replicators on other celestial bodies, this is unlikely to be permanently effective, thus delaying rather than foreclosing the gray-gooization of the Earth. Fourth, **solar expansion** poses catastrophic and existential risks to humanity through **hierarchy enablement**. The emergence of totalitarian world government, nearly universally viewed as deeply undesirable, is reasonably judged a catastrophic threat to humanity. As we have seen, space expansion is likely to (p.361) produce hierarchies in several significant ways. Many space advocates view large-scale space expansion as freedom insurance and anticipate that various forms of freedom and plurality deemed in jeopardy on Earth can be recovered and preserved in space. But anticipations of a freedom dividend from space expansion are largely illusory because large-scale space expansion into Earth orbital space is very likely to enable the erection of a highly hierarchical world government, either from one-state military dominance of the entire planet or from the control of a major infrastructure for resources or energy. The further large-scale expansion of human activity into solar space is likely to facilitate the emergence of a highly hierarchical world government on Island Earth that could then be prone to become **totalitarian**. The fifth way in which ambitious space expansion poses catastrophic and existential risks is through **alien generation**. The human species radiation anticipated by expansionists will generate significantly different forms of **intelligent life** suited to other worlds. If these anticipations are realized, there will be multiple intelligent species, all descendants from terrestrial Homo sapiens, in this solar system and eventually across the galaxy. While space expansionists celebrate this as an expansion of life, they rarely dwell on its implications for the future of human life. If ascentionist assumptions about moral improvement resulting from vertical expansion are true, humanity and its descendant species will live in harmony. But if ascentionist assumptions are unfounded, then the generation of alien intelligent species in this solar system should be viewed as a catastrophic and existential threat to humanity. As the cyber visionary Hans Moravec observes, “biological species almost never survive encounters with superior competitors.”[27](https://oxford-universitypressscholarship-com.offcampus.lib.washington.edu/view/10.1093/oso/9780190903343.001.0001/oso-9780190903343-chapter-10#oso-9780190903343-miscMatter-9-note-819) While habitat space expansionists embrace the Darwinian proposition that life inevitably expands, they do not seem to have thought through the implications of the corollary proposition that life forms often lethally compete. The mechanisms for the annihilation of humans by advanced forms of extraterrestrial life, long a staple of dystopian SF, are easy enough to imagine. While it might be possible for humanity, mobilized and directed by a centralized world government devoted to planetary and species defense, to survive for a while, eventually the sheer number and variety of alien species with advanced technology is sure to prevail. Fictional accounts of alien threats to humanity are typically about life forms originating on other planets, and their eventual defeat commonly results from improbable expedients and heroics. The more realistic threat is probably from humanity’s descendants, and this threat can simply be prevented from arising by relinquishing space colonization. The sixth way in which ambitious space expansion is related to catastrophic and existential risk is through **monster multiplication**. The number of “monsters,” threats that are unknown, has, we are told by riskologists, been steadily growing (p.362) with the development of powerful new technologies. Some monsters are in principle knowable, but others may be unknowable to humans. Ambitious space expansion will clearly entail the development of **powerful new tech**nologies, and the actors developing these technologies will be spread in multiple worlds across the solar system. Therefore it stands to reason that the number of monsters posing potential **terminal threats** will inevitably increase as ambitious space expansionist projects are realized. Taken together, these six ways in which the realization of the space expansionist program for solar space pose catastrophic and existential threats demolish the core proposition of space advocates that large-scale expansion is desirable. Space expansionists start with the persuasive proposition that technological capabilities for destruction are rapidly enlarging, while the Earth remains spatially finite. They then reason that expanding the spatial range of human activities through expansion into outer space will dilute dangers and bring the ratios between the powers of destruction and the spatial domain of human activity into safer proportions. But they fail to recognize or acknowledge that the potency of the destructive potentials inherent in space expansion also increases, and these capabilities can potentially be brought to bear on the finite and fragile Earth and its human populations, thus making the survival problem, at least for the Earth and humanity, much greater. If humans, or their alien progeny, occupying this vaster spatial realm behave in the same manner as they have on Earth, all that will have changed is that the magnitude of the threats will have been enlarged. For large-scale space expansion, there is no plausible human path of preservation bypassing its many very likely menaces and monstrosities. For humanity in space, there is only darkness at the end of the tunnel.

#### Scenario Two---*Earth Threats*

#### Climate change is on the brink of being unstoppable

Makowski 21[Michael Makowski, Progressive Media Project (Tns), 7-28-2021, "Planet burns while billionaires soar," Newsday, https://www.newsday.com/opinion/commentary/global-warming-billionaires-space-race-c74790]/ISEE

While record-breaking wildfires burned across the Western United States, Amazon executive chairman and billionaire Jeff Bezos stepped out of his space capsule to a crowd of cheering fans. His company Blue Origin’s first launch into space was a success. Bezos became the second billionaire to reach space and cement his stature as a leading private space industry figure. The three billionaires building the private space industry so far are: Richard Branson with Virgin Galactic, Elon Musk with SpaceX and Bezos with Blue Origin. Musk has yet to make the trip to space himself. "If we can do this," exclaimed Branson, who preceded Bezos’ space trip by about a week, "just imagine what you can do." With a billion dollars, he should have added. These billionaires see themselves as virtuous trailblazers of a new space age. While Branson has the more docile plan of business expansion and commercial space travel (think space tourism), Bezos envisions settlements on the moon. Musk, famously, locates humanity’s future in the colonization of Mars. Besides their money, eccentricities and desire to float in space, these three men share a dislike for paying taxes. Branson has moved billions between tax havens to avoid paying in his home country of England. For a number of years, Bezos and Musk, the two richest men in the world, paid no federal income taxes. Behind their space ambitions is a recognition of the more **earthly** challenges to our future: the depletion of resources, population growth and, most importantly, climate change. In his post-launch briefing, Bezos even spoke of the Earth’s fragility and the need to protect it. "As we move about the Earth, we damage it," he said. In a separate interview, he stressed the need to keep Earth "as this beautiful gem of a planet that it is." Admissions like this demonstrate a **willful** ignorance of the billionaires’ own complicity in these existential crises. Bezos’ Amazon is responsible for a carbon footprint that rivals that of some countries. At the same time, Bezos and his company fund a leading climate-change-denial think tank and reject grassroots employee demands for greater climate action. Amazon has created the Amazon Climate Pledge to reach net zero emission by 2040, and Bezos has pledged $10 billion toward the new Bezos Earth Fund. One year after creating the pledge, however, the company’s carbon emissions increased by 19%, and Bezos has only given a fraction of his pledge. Climate change is an immediate crisis that, at this point, we are in a stage of harm management and not prevention. Proponents of the Green New Deal argue that to salvage our planet and its inhabitants requires a warlike scale of mobilization. Estimates of the cost of reconstructing a new, green economy usually amount to trillions of dollars of government spending. In short, $10 billion isn’t going to cut it. Upon his return from the sky, Bezos made it a point to thank Amazon workers, who "paid for all this." This rhetorical thanks is a stark contrast to the working conditions in Amazon warehouses and the union-busting efforts pushed by Amazon around the country. It’s important to remember how these billionaires made their money and what their space race really means while so many issues persist at home. While they continue their **privatized** space race, the rest of humanity is **imperiled**. The planet will continue to burn, and inequality will worsen until massive action and investment is taken, which means billionaires finally paying their fair share. Billionaires would do best to put their space race on pause and focus more of their **attention** on this planet.

#### Space col trades off with earth focus and damns climate change reversal

Singh 02/03 [Samantha. “Billionaire Space Race Avoids Facing Consequences.” The Spectrum, 3 Feb. 2022, www.blakespectrum.org/blog/2022/02/03/billionaire-space-race-avoids-facing-consequences/]

On December 19th, 2021, the Falcon 9 rocket, a private vehicle owned by SpaceX, was launched, alleviating sustainability concerns regarding space exploration with the end goal of colonizing Mars. Suddenly, the idea of space exploration has become startlingly close, and less of a trope from a sci-fi movie. However, the romanticism surrounding the terraformation of Mars, and the space tourism industry as a whole, is not only idealistic–it’s incredibly dangerous. Space capitalists like Elon Musk, owner and founder of SpaceX, have released concerning statements that acknowledge Mars as having “no Earth-based government” that carries “authority or sovereignty over Martian activities” and that ‘“SpaceX will move to impose our own legal regime” to provide authority over Mars. This capitalist trick to curtail government involvement is particularly concerning, as the US government has no agency to instill any pre-existing labor or human rights protections on the planet. SpaceX is known for prioritizing profit over the well-being of their workers– many infamous lawsuits have detailed a toxic work culture rampant with sexual harassment and lack of workplace safety regulations, all swept under the rug by the company. There is no doubt that they will enforce similar exploitative labor practices on Mars. Mars colonization and similar endeavors are simply a way for the bourgeoisie to maximize profit while escaping government regulations needed to maintain healthy working conditions. The reality of space travel is ugly in more ways than one. For one, space exploration propagates Western colonization and imperialism. Institutions of oppression are inevitably bound to seep into space endeavors, specifically when it comes to claims over natural resources. The entitlement American private enterprises possess when it comes to exploring the frontier of space skirts dangerously into Manifest Destiny ideology, that we have the obligation to colonize space despite the ruthless exploitation of land and minority groups that will inevitably follow. This harmful ideology, a main motivating factor for space exploration, spins stories of ultra-nationalistic white men justifying exploitation to secure existence for the future generations, a notable white nationalistic dogwhistle. Manifest Destiny during early American history did guarantee existence for future generations, however they were exclusively white generations. To make matters worse, the rise in space tourism–an industry that sends civilians to space for leisurely reasons–holds deadly consequences for the environment. Wildfires, record heat waves, increased floods, among other rapid shifts in weather conditions, are just a few of the many climate disasters currently endangering all life on Earth. As flights to space double and triple in numbers in the next decade, in addition to the rockets, so too will carbon emissions and burning fuels, advancing the destruction of the ozone layer. The irony is not lost on anyone; billionaires push space-age Manifest Destiny and utopian daydreams on Mars as a way to escape the climate change that they largely accelerated, while continuing to fund the destruction of the atmosphere. However, many climate scientists acknowledge that it is not too late to rectify the situation on Earth. The facts are simple: Mars colonization is a form of utopianism, providing an escape for the bourgeoisie rather than a haven for all people. Conversely, climate change is a very real and devastating threat that requires immediate attention. Instead of shuttling money and precious resources into inhospitable planets like Mars, billionaires should reinvest in the Earth to ensure the safety of future generations. As countless climate activists and organizations have echoed throughout the years, there is no Planet B.

#### Climate Change is existential

Ng ’19 [Yew-Kwang; May 2019; Professor of Economics at Nanyang Technology University, Fellow of the Academy of Social Sciences in Australia and Member of the Advisory Board at the Global Priorities Institute at Oxford University, Ph.D. in Economics from Sydney University; Global Policy, “Keynote: Global Extinction and Animal Welfare: Two Priorities for Effective Altruism,” vol. 10, no. 2, p. 258-266; RP]

Catastrophic climate change Though by no means certain, CCC causing global extinction is possible due to interrelated factors of non‐linearity, cascading effects, positive feedbacks, multiplicative factors, critical thresholds and tipping points (e.g. Barnosky and Hadly, [2016](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0005); Belaia et al., [2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0008); Buldyrev et al., [2010](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0016); Grainger, [2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0027); Hansen and Sato, [2012](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0029); IPCC [2014](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0031); Kareiva and Carranza, [2018](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0033); Osmond and Klausmeier, [2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0056); Rothman, [2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0066); Schuur et al., [2015](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0069); Sims and Finnoff, [2016](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0072); Van Aalst, [2006](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0079)).[7](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-note-1009_67) A possibly imminent tipping point could be in the form of ‘an abrupt ice sheet collapse [that] could cause a rapid sea level rise’ (Baum et al., [2011](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0006), p. 399). There are many avenues for positive feedback in global warming, including: the replacement of an ice sea by a liquid ocean surface from melting reduces the reflection and increases the absorption of sunlight, leading to faster warming; the drying of forests from warming increases forest fires and the release of more carbon; and higher ocean temperatures may lead to the release of methane trapped under the ocean floor, producing runaway global warming. Though there are also avenues for negative feedback, the scientific consensus is for an overall net positive feedback (Roe and Baker, [2007](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0065)). Thus, the Global Challenges Foundation ([2017](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0026), p. 25) concludes, ‘The world is currently completely unprepared to envisage, and even less deal with, the consequences of CCC’. The threat of sea‐level rising from global warming is well known, but there are also other likely and more imminent threats to the survivability of mankind and other living things. For example, Sherwood and Huber ([2010](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0071)) emphasize the adaptability limit to climate change due to heat stress from high environmental wet‐bulb temperature. They show that ‘even modest global warming could … expose large fractions of the [world] population to unprecedented heat stress’ p. 9552 and that with substantial global warming, ‘the area of land rendered uninhabitable by heat stress would dwarf that affected by rising sea level’ p. 9555, making extinction much more likely and the relatively moderate damages estimated by most integrated assessment models unreliably low. While imminent extinction is very unlikely and may not come for a long time even under business as usual, the main point is that we cannot rule it out. Annan and Hargreaves ([2011](https://onlinelibrary-wiley-com.proxy.lib.umich.edu/doi/full/10.1111/1758-5899.12647#gpol12647-bib-0004), pp. 434–435) may be right that there is ‘an upper 95 per cent probability limit for S [temperature increase] … to lie close to 4°C, and certainly well below 6°C’. However, probabilities of 5 per cent, 0.5 per cent, 0.05 per cent or even 0.005 per cent of excessive warming and the resulting extinction probabilities cannot be ruled out and are unacceptable. Even if there is only a 1 per cent probability that there is a time bomb in the airplane, you probably want to change your flight. Extinction of the whole world is more important to avoid by literally a trillion times.

#### AND autonomous outsourcing---extinction

**Klare & Perry ’21** — Michael Klare, Five College, professor emeritus of peace and world security studies, and director of the Five College Program in Peace and World Security Studies, B.A. and M.A. from Columbia University and a Ph.D. from the Graduate School of the Union Institute, serves on the board of the Arms Control Association and advises other organizations; Lucas Perry, interviewer; (July 30th 2021; “Michael Klare on the Pentagon’s view of Climate Change and the Risks of State Collapse”; *Future of Life Institute*; <https://futureoflife.org/2021/07/30/michael-klare-on-the-pentagons-view-of-climate-change-and-the-risks-of-state-collapse/?cn-reloaded=1>; //LFS—JCM)

Lucas Perry: So, some sense of lethal autonomous weapons is potentially exacerbating or catalyzing the speed at which the ladder of escalation is moved through.

Michael Klare: No question about it. Many factors are contributing to that. The speed of weaponry, the introduction of hypersonic missiles, which cuts down flight time from 30 minutes to five minutes, the fact that wars are being conducted in what they call multiple domains simultaneously: cyber, space, air, sea, and ground, that no commander can know what’s happening in all of those domains and make decisions. So, you have to have what they want to create, a super brain called the Joint All-Domain Command and Control System, the JADC2 system, which will collect data from sensors all over the planet and compress it into simplified assessments of what’s happening, and then tell commanders, here are your choices, one, two, and three, and you have five seconds to choose, and if not, we’ll pick the best one and we’ll be linked directly to the firers to launch weapons. This is what the future will look like, and they’re testing this now. It’s called Project Convergence.

Lucas Perry: So, how do you see all of this affecting the risks of human extinction and of existential risks?

Michael Klare: I’m deeply concerned about this inclination to rely more on machines to make decisions of life and death for the planet. I think everybody should be worried about this, and I don’t think enough attention is being paid to these dangers of automating life and death decision-making, but this is moving ahead very rapidly and I think it does pose enormous risks. The reason that I’m so worried is that I think the computer assisted decision-making will have a bias towards military actions.

Humans are imperfect and sometimes we make mistakes. Sometimes we get angry and we go in the direction of being more violent and brutal. There’s no question about that, but we also have a capacity to say, stop, wait a minute, there’s something wrong here and maybe we should think twice and hold back. And, that’s saved us on a number of occasions from nuclear extinction. I recommend the book Gambling with Armageddon by Martin Sherwin, a new account of the Cuban Missile Crisis day by day, hour by hour account, and which it was clear that the US and Russia came very close, extremely close to starting a nuclear war in 1962, and somebody said, “Wait a minute, let’s just think about this. Let’s not rush into this. Let’s give it another 24 hours to see if we can come up with a solution.”

Adlai Stevenson apparently played a key role in this. I fear that the machines we designed are not going to have that kind of thinking built into them, that kind of hesitancy, that second thinking. I think the machines are going to be designed… The algorithms that inhabit them are going to reflect the most aggressive possible outcomes, and that’s why I fear that we move closer to human extinction in a crisis than before, and because of the time of decision-making is going to be so compressed that humans are going to have very little chance to think about this.

Lucas Perry: So, how do you view the interplay of climate change and autonomous weapons as affecting existential risk?

Michael Klare: Climate change is just going to make everything on the planet more stressful in general. It’s going to create a lot of stress, a lot of catastrophes occurring simultaneously and creating a lot of risk events happening that people are going to have to be dealing with, and they’re going to create a lot of hard, difficult choices. Let’s say you’re the president, you’re the commander in chief, and you have multiple hurricanes striking and fires striking the United States, that’s hardly an unlikely outcome, at the same time that there’s a crisis with China and Russia occurring where war would be a possible outcome. There’s a naval clash at sea in the South China Sea or something happening on the Ukraine border, and meanwhile, Nigeria is breaking apart and India and Pakistan are at the verge of war.

These are very likely situations in another 10 to 20 years if climate change proceeds the way it is. So, just the complexity of the environment, the stress that people will be under, the decisions they’re going to have to make swiftly between do we save Miami, or do we save Tokyo? Do we save Los Angeles, or do we save New York, or do we save London? We only have so many resources. In these conditions, I think the inclination is going to be to rely more on machines to make decisions and to carry out actions, and that I think has inherent dangers in it.

Lucas Perry: Do you and/or the Pentagon have a timeline for… How much and how fast is the instability from climate change coming?

Michael Klare: This is a progression. We’re on that path, so there’s no point at which you could say we’ve reached that level. It’s just an ever increasing level of stress.

Lucas Perry: How do you see the world in five or 10 years given the path that we’re currently on?

Michael Klare: I’m pessimistic about this, and the reason I am pessimistic is because if you go back and read the very first reports of the Intergovernmental Panel on Climate Change, the IPCC, their very first reports, and they would give a series of projections based on their estimates of the pace of greenhouse gas emissions. If they go this high, then you have these projections. If they go higher, then these projections out to 2030, 2040, 2050, we’ve all seen these charts.

So, if you go back to the first ones, basically we’re living in 2021 what they said were the worst case projections for 2040 to 2050 by and large. So, we’re moving into the danger zone. So, what I’m saying is we’re moving into the danger zone much, much faster than the most worst case scenarios that scientists were talking about 10 years ago, or 20 years ago, and if that’s the case, then we should be very, very worried about the pace at which this is occurring because we’re off the charts now from those earlier predictions of how rapidly sea level rise was occurring, desertification was occurring, heat waves. We’re living in a 2050 world now. So, where are we going to be in a 2030? We’re going to be in a 2075 world and that world was a pretty damn scary world.

#### Scenario Three---Disease

#### Space causes bacterial resistance to antibiotics which greatly increases infection and spread

Minhas 20 [Vikrant. Vikrant Minhas is a co-founder of the space research company ResearchSat “As If Space Wasn't Dangerous Enough, Bacteria Become More Deadly in Microgravity.” The Conversation, 23 July 2020, theconversation.com/as-if-space-wasnt-dangerous-enough-bacteria-become-more-deadly-in-microgravity-141053]

Worryingly, research from space flight missions has shown bacteria become more deadly and resilient when exposed to microgravity (when only tiny gravitational forces are present). In space, bacteria seem to become more resistant to antibiotics and more lethal. They also stay this way for a short time after returning to Earth, compared with bacteria that never left Earth. Adding to that, bacteria also seem to mutate quicker in space. However, these mutations are predominately for the bacteria to adapt to the new environment – not to become super deadly. More research is needed to examine whether such adaptations do, in fact, allow the bacteria to cause more disease. Read more: Bacteria found to thrive better in space than on Earth Bacterial team work is bad news for space stations Research has shown space’s microgravity promotes biofilm formation of bacteria. Biofilms are densely-packed cell colonies that produce a matrix of polymeric substances allowing bacteria to stick to each other, and to stationary surfaces. Biofilms increase bacteria’s resistance to antibiotics, promote their survival and improve their ability to cause infection. We have seen biofilms grow and attach to equipment on space stations, causing it to biodegrade. For example, biofilms have affected the Mir space station’s navigation window, air conditioning, oxygen electrolysis block, water recycling unit and thermal control system. The prolonged exposure of such equipment to biofilms can lead to malfunction, which can have devastating effects. Microorganisms that form biofilms include bacteria, fungi and protists. Shutterstock Another affect of microgravity on bacteria involves their structural distortion. Certain bacteria have shown reductions in cell size and increases in cell numbers when grown in microgravity. In the case of the former, bacterial cells with smaller surface area have fewer molecule-cell interactions, and this reduces the effectiveness of antibiotics against them. Moreover, the absence of effects produced by gravity, such as sedimentation and buoyancy, could alter the way bacteria take in nutrients or drugs intended to attack them. This could result in the increased drug resistance and infectiousness of bacteria in space. All of this has serious implications, especially when it comes to long-haul space flights where gravity would not be present. Experiencing a bacterial infection that cannot be treated in these circumstances would be catastrophic. The benefits of performing research in space On the other hand, the effects of space also result in a unique environment that can be positive for life on Earth. For example, molecular crystals in space’s microgravity grow much larger and more symmetrically than on Earth. Having more uniform crystals allows the formulation of more effective drugs and treatments to combat various diseases including cancers and Parkinson’s disease. Also, the crystallisation of molecules helps determine their precise structures. Many molecules that cannot be crystallised on Earth can be in space. So, the structure of such molecules could be determined with the help of space research. This, too, would aid the development of higher quality drugs. Optical fibre cables can also be made to a much better standard in space, due to the optimal formation of crystals. This greatly increases data transmission capacity, making networking and telecommunications faster. As humans spend more time in space, an environment riddled with known and unknown dangers, further research will help us thoroughly examine the risks – and the potential benefits – of space’s unique environment.

#### AND missions to colonize cause spacial microbes---extinction.

Kiona Smith-Strickland 15 [Kiona Smith-Strickland is a freelance science and technology journalist, 6/22/15, accessed 1/1/21, “Why Scientists Have Been Scared of Space Germs for Almost 50 Years”, [https://gizmodo.com/why-scientists-have-been-scared-of-space-germs-for-almo-1712562498]AGabay](https://gizmodo.com/why-scientists-have-been-scared-of-space-germs-for-almo-1712562498)AGabay)

If we find life on another world (assuming it’s not sentient and well-armed), we’re going to want to bring samples back to Earth. And we’re going to want to bring them back alive. So we’ve got to have a way of preventing back contamination, or the act of bringing extraterrestrial micro-organisms back to Earth, or into human colonies in space. Our typical ways of preventing contamination aren’t going to work — we can’t leave the life behind, and we can’t sterilize everything.

So we’d opt for heavy-duty containment.

When the Apollo missions returned with rock and dust samples from the Moon, back contamination was a major concern. At the time, scientists didn’t know whether there would be life on the Moon, but they felt it was better to be safe than sorry. To that end, according to NASA’s history of the quarantine program, “The existence of hazardous, replicating microorganisms on the moon would be assumed.”

During the missions, the Apollo crews were careful not to track materials from the lunar surface into the Command Module which would return to Earth. That sounds like “wash your hands and wipe your feet,” but it’s more complicated when you’re wearing a bulky spacesuit in an environment that’s full of dust.

Once they returned to Earth, the crews went into immediate quarantine. First they lived in a mobile isolation unit on the aircraft carrier that recovered the landing capsule, then in an aircraft set up for isolation, and finally in a special quarantine unit at the Johnson Space Center in Houston, Texas. They stayed there for three weeks, while NASA doctors performed tests and watched for any signs of illness that might indicate an alien infection.

Apollo 11 crew in quarantine. Image credit: NASA.

Meanwhile, the lunar samples went to the Lunar Receiving Lab at Johnson Space Center, where they could be studied in careful quarantine. Once the samples were proven to be devoid of life, some were released to other research facilities.

NASA’s plan for bringing Martian samples home is a bit more advanced. The agency’s Planetary Protection Subcommittee recently laid out its proposal for preventing back contamination. It includes a requirement that any samples brought back to Earth must be either sterilized or packed in a sealed container before being brought aboard the spacecraft. That containment system must also have a redundant failsafe as a backup. They’re not playing around.

The proposal also says, “The mission and the spacecraft design must provide a method to ‘break the chain of contact’ with Mars. No uncontained hardware that contacted Mars, directly or indirectly, shall be returned to Earth.” Sorry, Curiosity Rover: you can never come home.

Once on Earth, the samples would, according to NASA’s proposal, go straight to a Sample Return Facility, where they would be subjected to a battery of tests for potential biohazards. Once they’re deemed clean, they will be distributed to other research facilities. NASA’s proposed Sample Return Facility would include Biosafety Level 4 labs (the same types of facilities where viruses like Ebola are studied today), as well as cleanrooms to prevent the Martian samples from picking up any stray Earth germs.

Unfortunately, “such an integrated facility is not currently available,” NASA notes.

What Could Go Wrong?

So, what happens in the unlikely event that those measures fail, and the first crewed mission to Mars sets **alien microbes** loose on Earth? We don’t know, and that’s what makes containment so important. The whole thing could play out like a microscopic version of H.G. Wells’ War of the Worlds, where terrifying Martian invaders are killed off by Earth viruses. If extraterrestrial microbes escape from containment, they might not last long out in the world, where they have to compete with Earth’s own battalions of bacteria and viruses. Of course we might see the opposite scenario. Extraterrestrial microbes might thrive in Earth’s environment, and they might **out-compete** many Earth **microbes**, just like today’s terrestrial **invasive species** — which are problematic enough without help from other worlds. Humans would have no natural **immunity** to **Martian pathogens**, and our whole species might be **wiped** **out**. So you might think of extraterrestrial microbes as the potential next version of Ebola, which explains the Biohazard Level 4 recommendation. But humans aren’t the only ones in danger. Extraterrestrial microbes could rapidly **wipe out** Earth’s other **animal species**, **plants**, and **microbes**. That might actually be a more horrific scenario: humanity survives, but all the animals and plants we depend on for sustenance **die off**, or all the microbes that play such a vital role in our environment are displaced by alien microbes that don’t fill the same roles. There’s probably an excellent post-apocalyptic novel waiting to be built around that scenario.

### 1AC---Framing

#### 1---Actor spec—

#### a. governments have to aggregate since all collective actions incur tradeoffs that help some and hurt other, means based side constraints freeze action.

#### b. no act omission distinction for governments since policies create permissions and prohibitions so authorizing action cannot be an omission since the state assumes culpability in regulating the public domain, ie voting against something is still acting.

#### c. no intent foresight distinction— governments can’t have intent since they’re made up of multiple actors with separate motivations, ie some congress people might vote for something to gain votes while other actually think the bill is good.

#### Takes out and turns calc indicts, consequentialism might be hard but it’s not impossible, and the alternative is no action which is worse; and actor spec outweighs since different actors have different ethical standings.

#### 2--- Substitutability— only consequentialism explains necessary enablers.

Sinnott-Armstrong 92— Walter Sinnott-Armstrong, [Professor of practical ethics] 1992, “An Argument for Consequentialism” Dartmouth College Philosophical Perspectives

A moral reason to do an act is consequential if and only if the reason depends only on the consequences of either doing the act or not doing the act. For example, a moral reason not to hit someone is that this will hurt her or him. A moral reason to turn your car to the left might be that, if you do not do so, you will run over and kill someone. A moral reason to feed a starving child is that the child will lose important mental or physical abilities if you do not feed it. All such reasons are consequential reasons. All other moral reasons are non-consequential. Thus, a moral reason to do an act is non-consequential if and only if the reason depends even partly on some property that the act has independently of its consequences. For example, an act can be a lie regardless of what happens as a result of the lie (since some lies are not believed), and some moral theories claim that that property of being a lie provides amoral reason not to tell a lie regardless of the consequences of this lie. Similarly, the fact that an act fulfills a promise is often seen as a moral reason to do the act, even though the act has that property of fulfilling a promise independently ofits consequences. All such moral reasons are non-consequential. In order to avoid so many negations, I will also call them 'deontological'. This distinction would not make sense if we did not restrict the notion of consequences. If I promise to mow the lawn, then one consequence of my mowing might seem to be that my promise is fulfilled. One way to avoid this problem is to specify that the consequences of an act must be distinct from the act itself. My act of fulfilling my promise and my act of mowing are not distinct, because they are done by the same bodily movements.10 Thus, my fulfilling my promise is not a consequence of my mowing. A consequence of an act need not be later in time than the act, since causation can be simultaneous, but the consequence must at least be different from the act. Even with this clarification, it is still hard to classify some moral reasons as consequential or deontological,11 but I will stick to examples that are clear. In accordance with this distinction between kinds of moral reasons, I can now distinguish different kinds of moral theories. I will say that a moral theory is consequentialist if and only if it implies that all basic moral reasons are consequential. A moral theory is then non-consequentialist or deontological if it includes any basic moral reasons which are not consequential. 5. Against Deontology So defined, the class of deontological moral theories is very large and diverse. This makes it hard to say anything in general about it. Nonetheless, I will argue that no deontological moral theory can explain why moral substitutability holds. My argument applies to all deontological theories because it depends only on what is common to them all, namely, the claim that some basic moral reasons are not consequential. Some deontological theories allow very many weighty moral reasons that are consequential, and these theories might be able to explain why moral substitutability holds for some of their moral reasons: the consequential ones. But even these theories cannot explain why moral substitutability holds for all moral reasons, including the non-consequential reasons that make the theory deontological. The failure of deontological moral theories to explain moral substitutability in the very cases that make them deontological is a reason to reject all deontological moral theories. I cannot discuss every deontological moral theory, so I will discuss only a few paradigm examples and show why they cannot explain moral substitutability. After this, I will argue that similar problems are bound to arise for all other deontological theories by their very nature. The simplest deontological theory is the pluralistic intuitionism of Prichard and Ross. Ross writes that, when someone promises to do something, 'This we consider obligatory in its own nature, just because it is a fulfillment of a promise, and not because of its consequences.'12 Such deontologists claim in effect that, if I promise to mow the grass, there is a moral reason for me to mow the grass, and this moral reason is constituted by the fact that mowing the grass fulfills my promise. This reason exists regardless of the consequences of mowing the grass, even though it might be overridden by certain bad consequences. However, if this is why I have a moral reason to mow the grass, then, even if I cannot mow the grass without starting my mower, and starting the mower would enable me to mow the grass, it still would not follow that I have any moral reason to start my mower, since I did not promise to start my mower, and starting my mower does not fulfill my promise. Thus, a moral theory cannot explain moral substitutability if it claims that properties like this provide moral reasons.

#### 3--- Weighability— only consequentialism explains degrees of wrongness— you can only explain why breaking a promise to take a dying person to the hospital is worse than breaking a promise to meet for lunch by appealing to consequences.

#### 4--- Use epistemic modesty— that’s the probability of the framework being true times the magnitude of an impact under it.

#### a. substantively true: maximizes the probability of the most moral value; arguments against a framework mitigate offense under it but that mitigation is contingent, half the debate shouldn’t be thrown out just since someone’s 1% ahead on fwk.

#### b. clash: discourages debaters from ignoring contention level debate which means we get education about phil and the topic— topical ed outweighs since we only have 2 months for each topic; this is drop the arg.

#### 5---Evaluate consequences – not doing so is morally bankrupt

Daase and Friesendorf 10 (Daase; Christopher Daase; professor at the Goethe University Frankfurt and head of the program area International Organizations and International Law at the Peace Research Institute Frankfurt; Friesendorf; Cornelius Friesendorf; lecturer at the Goethe University Frankfurt and research fellow at the Peace Research Institute Frankfurt; “Rethinking Security Governance: the problem of unintended consequences”; Routledge; 2010; pp 205-207; <http://202.166.170.213:8080/xmlui/bitstream/handle/123456789/1343/Rethinking%20Security%20Governance%20The%20problem%20of%20unintended%20consequences%20by%20Christopher%20Daase.pdf?sequence=1&isAllowed=y#page=99>) [DTD]

Avoiding negative unintended consequences of security governance This book largely reflects an analytical understanding of security governance, not a normative one. Scholars like Anne-Marie Slaughter laud security governance as the most viable way of dealing with today’s problems (Slaughter 2004). This book, in contrast, started off from an agnostic point of view, describing security governance as a new mode of problem-solving and leaving open the question as to whether security governance efforts fulfill or frustrate policy objectives, and whether unintended consequences are positive or negative. But now, with the empirical results at hand, we move from the analytical to the normative. The chapters of this book have shown that many unintended consequences are negative, undermining the security of states, groups, and individuals (while at the same time creating new winners). This section briefly explores ways of avoiding negative unintended consequences of security governance. Not doing so would be the equivalent of researching climate change, nuclear technology, tourism, and many other issues that have negative consequences, without discussing opportunities for improvement. Offering clues is not the same as prescribing magic pills. For the issues discussed in this book, and for many other pressing contemporary problems, no magic pills are available, unfortunately. If traditional foreign policy causes negative unintended consequences (one example is the security dilemma during the Cold War), so does security governance. The chapters of this book may make sobering reading for anyone espousing security governance as the best contemporary policy mode. Even refined security governance tools such as targeted sanctions are not immune to unintended consequences, as Mikael Eriksson shows. There are many obstacles to avoiding costly unintended consequences of security governance. As the double effect phenomenon illustrates, unintended consequences are often the result of trade-offs. Also, analysts of unintended consequences have the benefit of hindsight; it is always easy to criticize afterwards. In contrast, policymakers must take decisions under conditions of insufficient and/or contradictory information and time pressure. Adding to these difficulties, there are political constraints, including public opinion, campaigns of opposition parties and transnational activist coalitions, and diverging interests among security governance stakeholders. Not doing anything may sometimes be better than doing something. But policymakers cannot be completely passive in the face of pressing problems, even if they wanted to. Also, one cannot do nothing: not intervening in an ongoing war has numerous political, economic, humanitarian, and normative unintended consequences. The “do no harm” principle should inform not only development work, but security governance as well (Aoi et al. 2007b: 274–275). But translating this mantra into practice is anything but easy. Complacency is another problem. Future generations in affluent countries will feel the effects of climate change, and poor people in poor countries are doing so already. Yet, most governments and ordinary citizens are unwilling to take drastic measures, such as change their lifestyles, in order to help slow down climate change. Hence, the “tragedy of the commons” will continue to haunt humanity (Hardin 1968). Short-term thinking and acting is not only, and not even primarily, a problem in “underdeveloped” countries. The short life cycle of democratically elected governments provides incentives to prioritize short-term gains over long-term costs – and many unintended consequences are visible only in the long run. As this book shows, international interventions to reduce the risk of violence, whether through sanctions, financial instruments, or the deployment of international security forces, yield unintended consequences. To avoid such consequences, preventing conflict in the first place would be the most logical approach. However, democratic systems provide few incentives for systematic conflict prevention (Schnabel 2002). The same mistakes are therefore repeated time and again (on the failure to learn from experience from past international rule of law efforts, see Carothers 2006