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#### Russia’s international ambitions are low now due to space sector failures. AFP 19

AFP 5/28/19 (Agence France-Presse - international news agency headquartered in Paris, “Moscow, we have a problem: theft plagues Russia’s space sector,” https://www.scmp.com/news/world/russia-central-asia/article/3012088/moscow-we-have-problem-theft-plagues-russias-space)

With millions of dollars missing and officials in prison or fleeing the country, Russia’s space sector is at the heart of a staggering embezzlement scheme that has dampened ambitions of recovering its Soviet-era greatness. For years, Moscow has tried to fix the industry that was a source of immense pride in the USSR. While it has bounced back from its post-Soviet collapse and once again become a major world player, the Russian space sector has recently suffered a series of humiliating failures. And now, massive corruption scandals at state space agency Roscosmos have eclipsed its plans to launch new rockets and lunar stations. “Billions (of roubles) are being stolen there, billions,” Alexander Bastrykin, the powerful head of Russia’s Investigative Committee – Russia’s equivalent of the FBI – said in mid-May. Investigations into corruption at Roscosmos have been ongoing “for around five years and there is no end in sight,” he added. In the latest controversy, a senior space official appears to have fled Russia during an audit of the research centre he headed. Yury Yaskin, the director of the Research Institute of Space Instrumentation, left Russia for a European country in April where he announced his resignation, the Kommersant paper reported. He feared the discovery of malpractice during an inspection of the institute, according to the newspaper’s sources. Roscosmos confirmed that Yaskin had resigned but did not clarify why. His Moscow institute is involved in developing the Russian satellite navigation system GLONASS designed to compete with the American GPS system. Corruption has particularly affected Russia’s two most important space projects of the decade: GLONASS and the construction of the country’s showpiece cosmodrome Vostochny, built to relieve Moscow’s dependence on Baikonur in ex-Soviet Kazakhstan. Almost all major companies in the sector, including rocket builders Khrunichev and Progress, have been hit by financial scandals that have sometimes led to prison sentences for large-scale fraud. Russia’s Audit Chamber, a parliamentary body of financial control, estimated that 760 billion roubles (around US$11.7 million) was misappropriated from Roscosmos in 2017, or nearly 40 per cent of the total misappropriated from the entire economy that year. Roscosmos said that “eradicating corruption” is one of its “primary goals”, adding that it regularly cooperates with investigations by the authorities. In mid-April, President Vladimir Putin stressed the need to “progressively resolve the obvious problems that slow down the development of the rocket-space sector.” “The time and financial frameworks to realise space projects are often unjustified,” the Russian leader Rebooting the space sector is a matter of prestige for the Kremlin. It symbolises its renewed pride and ability to be a major global power, especially in the context of increased tensions with the United States.

#### Space cooperation with the U.S. boosts Russia’s diplomatic leverage and international prestige

Juul 19 (Peter - senior policy analyst at the Center for American Progress, “Trump’s Space Force Gets the Final Frontier All Wrong,” 3/20/19, <https://foreignpolicy.com/2019/03/20/trumps-space-force-gets-the-final-frontier-all-wrong/>)

But funding isn’t everything, and in the new geopolitical context, democracy must be seen to work effectively. When it comes to space exploration, that means ratcheting back U.S. space cooperation with Russia as well as forgoing any equally intimate cooperation with China and its secretive space agency. The fact that the head of Russia’s space agency remains under U.S. sanctions for his role in Moscow’s military intervention in Ukraine illustrates the hazards involved in working with autocracies in space. Deep cooperation with autocratic powers in space gives autocracies a major point of diplomatic leverage over the United States, and more generally allows them to poach unearned international prestige by working on goals set and largely carried out by the United States. In today’s world, there’s no reason for the United States to give Russia or China this sort of standing by association.

#### Increased international prestige lays the foundation for Russian territorial expansion and foreign policy aggression

Gurganus 19 (Julia - nonresident scholar with the Russia and Eurasia Program at the Carnegie Endowment for International Peace & Eugene Rumer - senior fellow and the director of Carnegie’s Russia and Eurasia Program, “Russia’s Global Ambitions in Perspective,” 2/20/19, https://carnegieendowment.org/2019/02/20/russia-s-global-ambitions-in-perspective-pub-78067)

. Elsewhere, long-term conflicts, such as those in Afghanistan, Iraq, and Libya, or the unfinished business of post-conflict reconstruction, such as in the Balkans, have presented Russia with opportunities to insert itself and create new facts on the ground. In the United States and Europe, growing political divisions, the proliferation of information providers, and popular frustration with governing elites in the wake of the 2008 global financial crisis have exposed targets for Russian interference. Russian agents did not cause these long-term conflicts or cleavages inside Western societies, but they have used them to advance their goals, which vary depending on the circumstances. In many instances, the Kremlin has relied on a diverse toolkit that creates the appearance of operating one step removed from the Russian government (through a range of actors including state-owned corporations such as Rosatom and Rosneft, private security companies such as the Wagner Group, organized crime syndicates, hackers, and information operation organizations such as the Internet Research Agency). Western perceptions of post-Soviet Russia have been heavily affected by the country’s economic and political implosion and foreign policy retreat during the 1990s. Against that backdrop, the ambition and dynamism of Russian foreign policy since Putin’s 2012 return to the presidency appears to be a relatively new phenomenon. It isn’t. Moscow’s post-2012 foreign policy fits comfortably in the long-standing historical and intellectual tradition of Soviet and even pre-Soviet Russian foreign policy. THE TROIKA OF RUSSIAN FOREIGN POLICY Contemporary Russian foreign policy displays the unmistakable presence of three centuries-old drivers of Moscow’s posture on the world stage. Chief among these drivers is Russia’s quest for strategic depth and secure buffers against external threats, which, considering the country’s geography and absence of natural protective barriers between it and neighboring powers, has guided its geographic expansion. Along with physical insecurity and expansion, the second key driver of Russian foreign policy has been its ambition for recognition as a great power, which the Kremlin has long seen as necessary for legitimizing its geographic conquests and geopolitical ambitions. The third driver, related to the first two, is Russia’s complicated relationship with the West, which combines rivalry with the need for cooperation. These recurrent themes are important. They highlight the degree to which Russian foreign policy in the Putin era is a continuation of many pursuits that are, by turns, decades- and centuries-old and were embraced by previous Russian governments regardless of their political persuasion. The historical record also performs an important legitimizing function for the citizens of the Russian state, which is less than three decades old, cementing the state’s claim to be the heir to a long, illustrious tradition dating back centuries. References to this tradition thus legitimize the Putin government’s ambitious overseas pursuits and present them as a matter of historical continuity and as an integral part of what Russia is. GEOGRAPHY AND STRATEGIC DEPTH It is hard to overestimate the role of geography as a driver behind Russia’s foreign policy. The Russian state and its security policy have been shaped by the absence of natural geographic barriers—oceans, rivers, or mountains.2 Geography has shaped Russian identity and its rulers’ understanding of security throughout the entire existence of the Russian state. Throughout the centuries, contemporary Russia, the Soviet Union, imperial Russia, and the principality of Muscovy have all faced the challenge of securing a vast stretch of territory from neighbors perceived to be hostile to the west, south, and east. To secure its territory, the Russian state acquired more territory, which, in turn, had to be secured from ever-present external threats of one kind or another. In the words of historian Stephen Kotkin, “Whatever the original causes behind early Russian expansionism—much of which was unplanned—many in the country’s political class came to believe over time that only further expansion could secure the earlier acquisitions. Russian security has thus traditionally been partly predicated on moving outward, in the name of preempting external attack.”3 The loss of territory, as was the case after the two great dislocations Russia experienced in the twentieth century—first after the 1917 revolution and the 1918 Brest-Litovsk Treaty, and later after the 1991 breakup of the Soviet Union—resulted in a profound sense of Russian insecurity and a renewed quest to regain strategic depth. Regaining that depth was the key task of the Soviet government as soon as the country began to recover from the trauma of the revolution and the civil war, and again after Moscow regained a measure of strength after the collapse of the 1990s. GREAT POWER AMBITIONS The quest for recognition as a great power has been both the result of Russia’s geographic expansion and its driver. Geographic expanse was and is, in the eyes of Russian leaders, central to their claim to recognition as a great power. Such recognition, in turn, has been needed to lend a veneer of legitimacy to territorial conquests. Perhaps precisely because they have had to struggle repeatedly for such recognition, Russia’s rulers have been particularly sensitive to any suggestion that Russia does not belong in the ranks of major powers. In the mid-nineteenth century, Russian historian and writer Nikolay Danilevsky complained about Russia’s unfair treatment by Europe, which had turned a blind eye to Prussian and Austrian aggression against Denmark following the annexation of two Danish provinces yet criticized Russia’s efforts to protect the rights of its coreligionists in “barbaric” Turkey.4 Danilevsky’s complaint was, in effect, a precursor of Putin’s lament about the West’s double standards in dealing with Russia’s annexation of Crimea and the severing of Kosovo from Serbia.5 For the leaders of the independent Russia that emerged from the Soviet collapse, the Soviet and Russian imperial legacy appeared to serve as both an inspiration and a justification for their claim to great power status. They found ample philosophical rationales for their claim. In the words of noted Russian political philosopher Nikolai Berdyaev, empire and great power status constitute the essence of Russian identity even when the country is experiencing challenges and setbacks, in large part because of its spiritual and material wealth.6 As early as 1993, the official Foreign Policy Concept of the Russian Federation included, among other foreign policy priorities, the objectives of “furthering integration of the Commonwealth of Independent States” and ensuring Russia’s active role on the world stage as a “great power.”7 With Primakov’s rise to the helm of the Russian foreign policy establishment in 1996, great power ambitions again became the Kremlin’s driving force. In his first news conference as foreign minister, Primakov said, “Despite the present difficulties, Russia was and is a great power and its foreign policy should correspond with that.”8 Putin embraced this vision when he became president in 2000, and it has served as a cornerstone of his leadership ever since. Of particular importance to the Putin government has been the military record of the Russian state and its numerous conquests. Putin issued a presidential order in 2012 reconstituting the Russian Military-Historical Society.9 Long-serving Russian Culture Minister Vladimir Medinsky has been an active patron of the society as well. The expansion of the Russian state by force of arms—including numerous victories over Poland, Sweden, the Ottoman Empire, and Central Asia—make up an integral part of the foundational narrative of the contemporary Russian state. This narrative is reinforced by a sprawling state propaganda apparatus, official government activities, and educational curricula. Several historical events are featured prominently in this narrative. Russia’s defeat of Napoleon has been treated as a uniquely important event because of its significance to the European order in the nineteenth century, as well as for being an accomplishment that cemented Russia’s status as a great power. The victory over Nazi Germany in World War II is treated as the crowning achievement of the Soviet state, which saved not just the Soviet Union and Europe but the whole world from fascism. This triumph presently makes up the most important part of Russia’s national narrative. As a whole, this legacy provides both the justification and the motivation for Russia to pursue its ambitions not just around its vast periphery but well beyond its shores. UNEASY RELATIONS WITH THE WEST Moscow’s uneasy relationship with the West for centuries has been one of the most prominent features of its foreign policy. On the one hand—from Peter the Great’s founding of the new Russian capital on the Baltic shores to Catherine the Great’s engagement with leading European Enlightenment thinkers of the day, Czar Alexander I’s securing Russia’s place in the circle of major European powers to Joseph Stalin’s consolidation of the Soviet Union’s hold on Eastern Europe—Russia long has been an integral part of Europe and its political and security fabric. On the other hand, throughout Russian history since the time of Peter the Great, Russian elites, political thinkers, and cultural figures have questioned Russia’s European choice and relationship with Europe. In a more recent and very telling sign of that ambivalence, Foreign Minister Lavrov wrote in 2016 that, over the centuries, Russia has seen itself as part of Europe and the West, as better than the West, as different and unique from the West, and as representing a crucial link between the East and the West.10 The biggest obstacle that has kept Russia from having a closer and more stable relationship with Europe, according to Lavrov, has been Europe’s inability or unwillingness to simply let Russia be Russia, and its insistence on having Moscow conform to European norms—something that no Russian leader or the people of Russia would ever accept. Moscow’s claim to great power status has derived from its victories in the West, against Napoleon and Hitler. But Russia’s biggest setbacks too have been delivered by the West—in the Crimean War and in the Cold War—and these setbacks remain the biggest drivers of Moscow’s security and defense policy.11 As was the case during the Cold War, Russian policy toward the West has long had an important ideological dimension. During the Soviet era, the ideological competition was between Soviet communism and democratic capitalism. After a relatively brief period when Russia attempted to join the West, Moscow has embraced an overtly anti-Western ideology. Communism has been replaced by a mix of nationalist, authoritarian, and state-capitalist ideas as an alternative to the West’s notion of liberal democratic capitalism. The concept of Russia as a besieged fortress facing hostile Western designs and influences is a key tool the regime uses to mobilize the political support of Russian elites and ordinary citizens alike. OLD HABITS DON’T DIE In addition to a legacy of complicated geopolitics, great power ambitions, and a difficult relationship with the West, the new Russian state has inherited from its Soviet predecessor a time-tested foreign policy toolkit. While some elements of this toolkit fell into disuse early in the post-Soviet period when Russia was struggling with a series of domestic crises, these tools have been taken up again by the country’s foreign policy and national security establishment as Moscow has returned to the world stage as an increasingly assertive actor. George Kennan wrote in “The Sources of Soviet Conduct”: . . . the Kremlin is under no ideological compulsion to accomplish its purposes in a hurry . . . and it can afford to be patient. These precepts are fortified by the lessons of Russian history: of centuries of obscure battles between nomadic forces over the stretches of a vast unfortified plain. Here caution, circumspection, flexibility and deception are the valuable qualities . . . Its [the Soviet Union’s] political action is a fluid stream which moves constantly, wherever it is permitted to move, toward a given goal. . . . The main thing is that there should always be pressure, unceasing constant pressure, toward the desired goal. There is no trace of any feeling in Soviet psychology that that goal must be reached at any given time.12 Russian foreign policy in the Putin era fits Kennan’s description from more than half a century ago. The Kremlin’s approach has involved the relatively low-cost, limited use of military force in combination with other nonmilitary instruments of national power. Information operations, propaganda and disinformation, cyber operations, trade embargoes, and a vast array of other tools have been integrated into what has become commonly known as hybrid warfare. The current policy discussions in Western capitals often create the impression that Moscow has come up with a fundamentally new toolkit. In reality, an extensive reliance on such tools has long been a feature of Russian domestic politics and foreign policy.

#### Russian territorial expansion causes nuclear war with the U.S. and NATO

O’Hanlon 19 (Michael – PhD from Princeton in Public and International Affairs and currently a senior fellow at the Brookings Institute, “The Senkaku Paradox: Risking Great Power War Over Small Stakes,” p. 34-37, 4/30/19, Dartmouth Libraries)

As such, the United States and NATO partners would undoubtedly feel intense pressure, at the first sign of visible preparations for attack by Russia, to disable Russia’s surveillance and command and control capabilities and to preempt any missiles or aircraft or submarines before they could get within range of the target. That could, of course, entail direct attacks against airfields, ports, and other facilities on Russian soil, not just those that happened to be directly involved in the Baltic state occupation. In other words, NATO might strike first, rather than leave itself vulnerable to ambush. In light of the alliance’s consensus decision-making procedures, that possibility seems unlikely—but it must also be remembered that this scenario is premised on a situation in which Russian forces occupy at least a small swath of NATO territory, so certain thresholds would already have been crossed by enemy action. Regardless, the stage would be set for an extremely dangerous dynamic. If any initial conventional engagements went against its interests, Russia might also consider limited nuclear employment options. Indeed, some of its strategists currently entertain an “escalate to de-escalate” concept that would attempt to intimidate NATO allies into reversing their plans. Russia might detonate a nuclear weapon high in the atmosphere to create a powerful nuclear-induced electromagnetic pulse (EMP) that could prove lethal to air defense radars, military communications systems, and much civilian infrastructure over a region many hundreds of kilometers in radius. A Russian EMP burst using a high-altitude nuclear weapon would be an extremely provocative and risky move, to be sure.57 But some Russian leaders could argue that it was not strictly speaking a nuclear attack, since no humans would be killed by the direct explosive effects of such a weapon—and thus might delude themselves into thinking it was a relatively low-risk option. In fact, the risks could be very high. Some types of EMP attacks (or even cyberattacks) by Russia could disable large chunks of the U.S. or European electricity grids for many months.58 A severe attack of this type might even lead to a U.S. nuclear response, in light of the new nuclear doctrine of the Trump administration.59 Beyond the EMP option, Russia could use nuclear weapons directly against ships that carried military equipment, missile defense radars, or other capabilities. Indeed, it threatened to target nuclear missiles at any Danish ships joining the U.S.-led missile defense effort in 2015. Again, the provocation would be enormous—but the direct human stakes might be fairly limited, since only dozens of sailors, or at most a couple hundred, might be on a given naval vessel.60 Moscow might, perhaps delusionally, think the risks were acceptable. Of course, there would be enormous significance and risk to crossing the nuclear threshold in any way. But if weapons were used against isolated military targets (as both sides contemplated in various ways during the Cold War), Moscow again might convince itself, rightly or wrongly, that escalation risks could be tolerated and managed. That might be particularly true for attacks limited to the kinds of target sets that posed disproportionate vulnerability and dependence for NATO. These could include cargo ships at sea, rail marshaling yards where train tracks change gauge (necessitating unloading and reloading) at the Poland-Lithuania border, or particularly weak bridges without nearby alternative routes.61 If Russia could limit NATO fatalities to hundreds of sailors and not itself present any target sets that were characterized by a similar combination of relatively high military importance and relatively great separation from vulnerable civilian populations, NATO might not have a good recourse. Moscow might hope as much, at least—and so elect to roll the dice. Such a decision would be reckless and foolish, but perhaps not beyond the pale of how human beings have behaved historically in wars they felt they were otherwise likely to lose. The Outcome of the Scenario: Toward a Net Assessment With all these factors in motion, how would this kind of conflict likely play out? A NATO military response to the postulated Russian aggression seems very likely. Perhaps evidence of its preparations to move forces into position to defend its ally and liberate its territory from Russian occupation would be enough to catalyze a diplomatic resolution of the crisis. If not, however, the stage would be set for the possible eruption of World War III. Russia might try to impede a deployment through cyber-, space, and other such attacks, which would likely only slow the deployment, not stop it. Thus escalation could easily result.62 Once shots were fired, NATO would be unlikely to back down. Not every nation would necessarily send significant military forces, to be sure, but some key countries would probably remain resolute. Much more likely than acceptance of defeat would be a redoubled commitment to complete the mission—and, if Russian nuclear weapons had been used by that point, even in a limited attack, to respond in kind. Put differently, if Russia did choose to try to physically prevent the deployment of large forces into eastern NATO territory in likely preparation for a counterattack, there would be two possibilities. If that attempt failed, a showdown in the east on land would still loom. If it succeeded, NATO would then face a momentous decision: accept defeat, or reinforce dramatically with conventional forces (perhaps after a period of repairing damage and building more equipment and weaponry, depending on how many losses it had already suffered), or escalate to the nuclear level. In situations of this sort, the parties to the conflict might find themselves living scenarios like those that nuclear theorists pondered throughout the Cold War. They could be engaged in behavior that Thomas Schelling might have described as “the threat that leaves something to chance” or that Herman Kahn might have placed on the lower rungs of a nuclear escalation ladder that reached potentially to all-out war.63 American planners saw these kinds of escalatory ladders and options as ideas that might serve U.S. interests; thus it would not be too surprising to see Russian planners invoke them now.64 And whatever the dangers during the deployment phase, they would snowball during any actual maneuver warfare in eastern Europe. For example, it is entirely imaginable that an operation designed to liberate a Baltic state from a Russian occupation would trespass onto Russian territory to cut off supply lines and possible reinforcements.65 Moscow may or may not simply take NATO’s word that it has no designs on the country’s government. In other words, it might even fear that NATO’s counteroffensive could aspire to regime change in Russia. It may or may not have a clear picture of the kind of attack it is experiencing, as command and control systems would be compromised in the course of conventional battle, quite possibly including those systems commonly used for nuclear weapons.66 I conclude that, for a hypothetical conflict occurring sometime in the near future, enough uncertainties exist to make the outcome of the war somewhat unpredictable. One cannot simply assert that NATO’s numerous advantages guarantee a victory. The Baltics’ exposed geographic location, NATO’s limited means of deploying reinforcements to the region reliably, Russia’s options in domains ranging from cyberspace to outer space, and the possible use of nuclear weapons even in just a limited, tactical role make it uncertain that NATO could confidently expect victory despite collectively outspending Russia by more than ten to one in the military arena. For example, it is not clear that the United States could safely send most of its major ocean transport vessels to ports of debarkation and unload supplies there in the face of a conventional military threat. And if it lost a substantial fraction of its top-line supplies and ships to Russian attacks in its first attempt, the United States might need time to prepare for a second effort, which might then have to begin further west in Europe where disembarking and marshaling of forces could be carried out more safely, before those forces gradually made their way eastward. NATO would probably win such a conventional war, but it could take many months or even years. And even then, the deep uncertainties associated with possible nuclear escalation make it unclear whether victory could even be meaningful. Few would say that a few thousand square kilometers of Baltic territory logically warrant nuclear risks. But human beings are not always logical. Nuclear brinkmanship over a limited-war scenario in eastern Europe would not be unthinkable, based on what we know of history and human nature. And if nuclear weapons were ever used, even in small numbers at first, all bets are off as to where and how the conflict would end.

## 2

#### CP text: space faring nations should establish an international governing body that:

1. **Regulates commercial operations in outer space and**
2. **Establishes a Space Resource Fund**

#### CP solves - Creating a legal regime ensures everyone benefits from mining creates sustainable mining while avoiding conflict & promoting competition

Morgan **Saletta 16,** PhD, History and Philosophy of Science, The University of Melbourne, “All of humanity should share in the space mining boom,” Conversation, 4-17-2016, https://theconversation.com/all-of-humanity-should-share-in-the-space-mining-boom-57740

One solitary asteroid might be worth trillions of dollars in platinum and other metals. Exploiting these resources could lead to a global boom in wealth, which could raise living standards worldwide and potentially benefit all of humanity. There are already companies, such as Planetary Resources, hoping to make mining in space a reality. Peter Diamondis, co-founder of Planetary Resources and founder of the XPrize Grand Challenges, believes that the benefits to humanity give us a moral imperative to explore and utilise space. He has also declared “there are twenty-trillion-dollar checks up there, waiting to be cashed!” However, behind the utopian rhetoric and dazzling dreams of riches lie some very real problems. Ownership and the Outer Space Treaty The framework of international space law is given by the Outer Space Treaty (OST), which entered into force in 1967. Among its main principals, the OST includes these statements: the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind and, outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means Because the OST is generally interpreted as preventing anything like private fee-simple ownership, it is sometimes claimed to be an obstacle to commercial ventures in space. But such claims simply do not hold water. There are numerous terrestrial examples where resources are profitably exploited in the absence of fee-simple ownership. Governments routinely licence companies to engage in timber extraction, mining, offshore oil exploration and other activities, receiving royalties payments on production. In the United States, revenues from such royalties totalled some US$13.5 billion dollars in 2014 from federally owned or managed lands alone. Nevertheless, some proponents of mining in outer space argue for serious modification or an end to the Outer Space Treaty and claim, against the evidence, that without fee-simple ownership, there is no incentive for commercial exploitation. The Unites States’ Space Act of 2015 was just one volley – and a deliberately vague one at that – in this ongoing international debate. A balanced approach? The riches exist, but how will humanity benefit from mining in outer space, or for that matter, **other global commons such as the deep sea floor?** Behind the lofty rhetoric of benefits to humanity, there is a dark shadow of voodoo economics, the shambling, walking dead figure of trickle down economics– and the possibility of a world where a few trillionaires enjoy the view from space while others barely eke a living on its surface. Yet we do suggest that commercial interests and profit seeking can be a healthy part of the exploration of outer space. Yet outer space is not the Wild West frontier of Frederick Jackson Turner, nor do we live in the Gold Rush days of Jack London’s tale of greed and death. In the common heritage of space, with multiple state and private actors engaging in exploration and potentially exploitation, **international cooperation and oversight will benefit all.** The Alaskan model There is a balanced, pragmatic approach that will promote commercial and profit driven activities, while also producing tangible benefits to all of humanity. Importantly, this pragmatic approach has a well established precedent that has existed for nearly 40 years. And this comes not from a social democracy or left-wing ideology, but was the brainchild of a libertarian, Republican governor of Alaska, Jay Hammond. That model is the Alaska Permanent Fund Corporation (APFC) created in 1976, and its unique “citizen’s dividend”. The APF is a resource wealth fund, which derives its revenue primarily from leases on oil fields. In 1977, Hammond suggested that “rather than permitting government to spend all public monies earned through the exploitation of the public’s resources for what government thinks best, let’s grant shares to Alaskans.” The first dividend payment was made in 1982, and in 2015 that payment amounted to US$2,072. Linking a citizen’s dividend to a sovereign wealth fund was unique, but the idea of a citizen’s dividend has a long and venerable tradition. One of the earliest advocates was no less than the political theorist and American Revolutionary, Thomas Paine. International body How would this work for outer space? We need an international body similar to the International Seabed Authority, which was established by the United Nations Convention on the Law of the Sea, or the International Telecommunications Union, which allocates satellite orbits. **This would provide the stable business and investment environment that entrepreneurs seek by ensuring international law and obligations are met**. This body could license outer space resources and levy a royalty on production, which is part of standard business practice between petroleum and other mining companies and governments here on Earth. In turn, these revenues, or a significant portion thereof, would be deposited in a Space Resource Fund, possibly under the aegis of the World Bank. And every single citizen on Earth, say aged 18 or above, would receive a dividend on a yearly basis as their rightful share as owners of the common province of humankind. Crucially, we are not suggesting redistribution, which has been an obstacle to the International Seabed Authority and the Moon Treaty in the past, but a fair share dividend of wealth that truly belongs to everyone. Our model doesn’t provide a handout, or a welfare cheque, or charity from a trillionaire philanthopist; it pays **every owner in a global commons a share of what is rightfully theirs.** Even tiny dividends by the standards of the world’s wealthy nations would make a difference for some developing world farmers. **If there truly are trillions of dollars out there, then this might be something fundamentally world changing.** We accept that Larry Page and Sir Richard Branson – founding investors and advisors in Planetary Resources – and its founders Eric Anderson and Peter Diamandis, truly want humanity to benefit from outer space, and that they truly believe in corporate social responsibility and a sustainable future. We would encourage them to embrace the idea that the sky really does belong to all of us, as the common “province of all mankind”. By paying rent for the right to exploit resources in space and royalties on production, the same way oil companies pay to exploit oil in the Gulf of Mexico, they’ll be engaging in business as usual. They will have bought the right to make a potentially enormous profit and prove they really are responsible global citizens. And they’d get a citizen’s dividend cheque too.

## Case

### FW

#### Extinction first.

#### Extinction outweighs -- value to life is inevitable, so subjective it can’t be the basis for impact calculus, and discussing extinction is good even if we don’t solve it

Khan 18 [Risalat, activist and entrepreneur from Bangladesh passionate about addressing climate change, biodiversity loss, and other existential challenges. He was featured by The Guardian as one of the “young climate campaigners to watch” (2015). As a campaigner with the global civic movement Avaaz (2014-17), Risalat was part of a small core team that spearheaded the largest climate marches in history with a turnout of over 800,000 across 2,000 cities. After fighting for the Paris Agreement, Risalat led a campaign joined by over a million people to stop the Rampal coal plant in Bangladesh to protect the Sundarbans World Heritage forest, and elicited criticism of the plant from Crédit Agricolé through targeted advocacy. Currently, Risalat is pursuing an MPA in Environmental Science and Policy at Columbia University as a SIPA Environmental Fellow, “5 reasons why we need to start talking about existential risks,” https://www.weforum.org/agenda/2018/01/5-reasons-start-talking-existential-risks-extinction-moriori/]

Infinite future possibilities I find the story of the Moriori profound. It teaches me two lessons. Firstly, that human culture is far from immutable. That we can struggle against our baser instincts. That we can master them and rise to unprecedented challenges. Secondly, that even this does not make us masters of our own destiny. We can make visionary choices, but the future can still surprise us. This is a humbling realization. Because faced with an uncertain future, the only wise thing we can do is prepare for possibilities. Standing at the launch pad of the Fourth Industrial Revolution, the possibilities seem endless. They range from an era of abundance to the end of humanity, and everything in between. How do we navigate such a wide and divergent spectrum? I am an optimist. From my bubble of privilege, life feels like a rollercoaster ride full of ever more impressive wonders, even as I try to fight the many social injustices that still blight us. However, the accelerating pace of change amid uncertainty elicits one fundamental observation. Among the infinite future possibilities, only one outcome is truly irreversible: extinction. Concerns about extinction are often dismissed as apocalyptic alarmism. Sometimes, they are. But repeating that mankind is still here after 70 years of existential warning about nuclear warfare is a straw man argument. The fact that a 1000-year flood has not happened does not negate its possibility. And there have been far too many nuclear near-misses to rest easy. As the World Economic Forum’s Annual Meeting in Davos discusses how to create a shared future in a fractured world, here are five reasons why the possibility of existential risks should raise the stakes of conversation: 1. Extinction is the rule, not the exception More than 99.9% of all the species that ever existed are gone. Deep time is unfathomable to the human brain. But if one cares to take a tour of the billions of years of life’s history, we find a litany of forgotten species. And we have only discovered a mere fraction of the extinct species that once roamed the planet. In the speck of time since the first humans evolved, more than 99.9% of all the distinct human cultures that have ever existed are extinct. Each hunter-gatherer tribe had its own mythologies, traditions and norms. They wiped each other out, or coalesced into larger formations following the agricultural revolution. However, as major civilizations emerged, even those that reached incredible heights, such as the Egyptians and the Romans, eventually collapsed. It is only in the very recent past that we became a truly global civilization. Our interconnectedness continues to grow rapidly. “Stand or fall, we are the last civilization”, as Ricken Patel, the founder of the global civic movement Avaaz, put it. 2. Environmental pressures can drive extinction More than 15,000 scientists just issued a ‘warning to humanity’. They called on us to reduce our impact on the biosphere, 25 years after their first such appeal. The warning notes that we are far outstripping the capacity of our planet in all but one measure of ozone depletion, including emissions, biodiversity, freshwater availability and more. The scientists, not a crowd known to overstate facts, conclude: “soon it will be too late to shift course away from our failing trajectory, and time is running out”. In his 2005 book Collapse, Jared Diamond charts the history of past societies. He makes the case that overpopulation and resource use beyond the carrying capacity have often been important, if not the only, drivers of collapse. Even though we are making important incremental progress in battles such as climate change, we must still achieve tremendous step changes in our response to several major environmental crises. We must do this even while the world’s population continues to grow. These pressures are bound to exert great stress on our global civilization. 3. Superintelligence: unplanned obsolescence? Imagine a monkey society that foresaw the ascendance of humans. Fearing a loss of status and power, it decided to kill the proverbial Adam and Eve. It crafted the most ingenious plan it could: starve the humans by taking away all their bananas. Foolproof plan, right? This story describes the fundamental difficulty with superintelligence. A superintelligent being may always do something entirely different from what we, with our mere mortal intelligence, can foresee. In his 2014 book Superintelligence, Swedish philosopher Nick Bostrom presents the challenge in thought-provoking detail, and advises caution. Bostrom cites a survey of industry experts that projected a 50% chance of the development of artificial superintelligence by 2050, and a 90% chance by 2075. The latter date is within the life expectancy of many alive today. Visionaries like Stephen Hawking and Elon Musk have warned of the existential risks from artificial superintelligence. Their opposite camp includes Larry Page and Mark Zuckerberg. But on an issue that concerns the future of humanity, is it really wise to ignore the guy who explained the nature of space to us and another guy who just put a reusable rocket in it? 4. Technology: known knowns and unknown unknowns Many fundamentally disruptive technologies are coming of age, from bioengineering to quantum computing, 3-D printing, robotics, nanotechnology and more. Lord Martin Rees describes potential existential challenges from some of these technologies, such as a bioengineered pandemic, in his book Our Final Century. Imagine if North Korea, feeling secure in its isolation, could release a virulent strain of Ebola, engineered to be airborne. Would it do it? Would ISIS? Projecting decades forward, we will likely develop capabilities that are unthinkable even now. The unknown unknowns of our technological path are profoundly humbling. 5. 'The Trump Factor' Despite our scientific ingenuity, we are still a confused and confusing species. Think back to two years ago, and how you thought the world worked then. Has that not been upended by the election of Donald Trump as US President, and everything that has happened since? The mix of billions of messy humans will forever be unpredictable. When the combustible forces described above are added to this melee, we find ourselves on a tightrope. What choices must we now make now to create a shared future, in which we are not at perpetual risk of destroying ourselves? Common enemy to common cause Throughout history, we have rallied against the ‘other’. Tribes have overpowered tribes, empires have conquered rivals. Even today, our fiercest displays of unity typically happen at wartime. We give our lives for our motherland and defend nationalistic pride like a wounded lion. But like the early Morioris, we 21st-century citizens find ourselves on an increasingly unstable island. We may have a violent past, but we have no more dangerous enemy than ourselves. Our task is to find our own Nunuku’s Law. Our own shared contract, based on equity, would help us navigate safely. It would ensure a future that unleashes the full potential of our still-budding human civilization, in all its diversity. We cannot do this unless we are humbly grounded in the possibility of our own destruction. Survival is life’s primal instinct. In the absence of a common enemy, we must find common cause in survival. Our future may depend on whether we realize this.

### Solvency

#### T/L: The aff is horrible.

#### 1) Vote neg on presumption – the aff does nothing. Indicating outer space as recognized as a global commmons does nothing to actually rectify the material conditions of outer space because recognition isn’t the same thing as actually banning/regulating mining.

#### 2) Who recognizes the aff? How is it enforced? Who’s the actor? Without any explanation of this the aff can’t solve since it just can’t magically be enforced

#### 3) Here’s their Goehring ev that indicates that viewing space as a global commons is bad for the purpose of decisionmaking – link turns their scenarios. Harker reads green

1AC Goehring 6/3 - John S. Goehring [B.A., University of California, Berkeley; J.D., Tulane Law School; LL.M., McGill University, Institute of Air and Space Law) is a space and international law attorney for the Department of Defense and a judge advocate in the United States Air Force Reserve], “Why Isn’t Outer Space a Global Commons?” *Journal of National Security Law and Policy*. Vol. 11:573. (June 3, 2021).<https://jnslp.com/wp-content/uploads/2021/09/Why\_Isnt\_Outer\_Space\_a\_Global\_Commons\_2.pdf> JB

B. How “**Global Commons” as a** Constraining **Concept is Ill-Suited to Outer Space.** The constraining concept can have two distinct meanings and both face difficulty when applied to outer space. The observation in EO 13914 that outer space is a “physically unique domain” alludes to the meaning of commons as a category of resources.69 This uniqueness is apparent in its immense scale and the sheer variety of physical attributes. Hence, **to say that outer space is a global commons**, meaning a commons in the sense of an open access economic resource, “**would be a sweeping generalization and . . . utterly meaningless**.”70 **Outer space is extraordinarily vast with myriad resources** and benefits. **As such**, outer space **defies any attempt to generalize the entirety as a singular** common **resource**. **Void space, galaxies, planets, stars, moons, asteroids, different Earth orbits, moon orbits, Lagrange points, the various benefits that all these may provide – these cannot be lumped together and thought of as a single common resource, let alone a common resource that ought to be governed by the inhabitants of planet Earth.** In this sense, **thinking of space as a global commons would indeed be more distracting than helpful**. Moreover, the **physical uniqueness** of outer space **is such that any** conclusions about **governance** **based on analogies** to other domains **should be viewed with skepticism**. Nevertheless, although it may be nonsensical to think of outer space as a singular resource, this does not necessarily preclude particular resources in outer space from being considered a commons. A recently completed report by the National Academy of Public Administration (NAPA) takes this view. Commissioned by Congress to evaluate which federal agency should take on the space traffic management (STM) mission, the NAPA report observes it may be “useful to think of some regions of orbital space as a common pool resource (CPR)” because “one actor’s use of the shared resource does subtract from what is available to others” (emphasis original).72 It goes on to say “the heavily used regions of low Earth orbit (LEO) and geosynchronous orbit (GEO) are both rivalrous and congestible and can be thought of as CPRs.”73 The NAPA report categorizes certain resources in space without attributing a particular legal construct for owning those resources. With regard to ownership under international space law, the legality of the recovery and of resources in outer space, commercial or otherwise, is fundamentally a question of whether such recovery constitutes a permissible use under Article I of the Outer Space Treaty or, instead, a prohibited appropriation under Article II. Article I reads: The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind. Outer Space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies. There shall be freedom of scientific investigation in outer space, including the moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation.74 All States, including the United States, are free to use outer space. However, this freedom does not include the ability of States or commercial entities to appropriate outer space.75 Article II reads: Outer space, including the moon and celestial bodies, is not subject to national appropriation by claim of sovereignty by means of use or occupation or by any other means.76 This non-appropriation principle prohibits claims to real property (territory) on the Moon or celestial bodies, whether by private entities or States.77 As Professor Cheng explains, “[t]he concept of non-appropriation embodied in Article II is the same as that which has been traditionally applied to the high seas. It simply means that as among contracting States, none will be entitled to exercise territorial jurisdiction”.78 “However, separate from the problem of appropriating parts of outer space and celestial bodies,” Cheng observes, “is that of appropriating resources of outer space and celestial bodies.”79 This distinction is key. **Space resources are not necessarily regarded as equivalent to territory when it comes to interpreting the nonappropriation principle**. To repeat, the question of whether international law permits the recovery and exploitation of resources in outer space, commercial or otherwise, is fundamentally a question of whether such recovery and exploitation constitute a permissible use under Article I or, instead, a prohibited appropriation under Article II. With regard to the resources themselves, the United States has long held the position that Article II prohibits ownership over space resources “in place” but does not prohibit ownership by States or private entities over resources that have been removed from their place on or below the surface of the moon or celestial bodies, and that such removal is a form of use permitted under Article I. More recently, the 2015 Commercial Space Launch Competitiveness Act implicitly reaffirms this interpretation and implements it as a matter of domestic law.81 The Artemis Accords further reinforce this position. Hence, the United States does not interpret the Outer Space Treaty as supporting the notion that outer space is a global commons when the term is used a constraining concept. The separate question of whether the Outer Space Treaty permits the semi-permanent occupation of a site on the moon for resource extraction remains unresolved.82 This issue is also best framed as a question of whether the occupation of a territory would be considered a use consistent with Article I or, in the alternative, an appropriation of the site prohibited under Article II. It could be argued that stations on the Moon cannot be installed in a manner which impede free access by other States to all areas.83 Alternatively, it could be argued that the problem is analogous to the norms that have developed with regard to the use of geosynchronous orbital slots. Although use of geosynchronous orbital slots is exclusive, State practice has shown that exclusive use is not regarded as an unlawful appropriation. These norms have arisen in part due to the technological requirement that orbital slots in geostationary orbit must be exclusive if satellites are to operate without interference.84 It bears noting, however, that an international organization, the International Telecommunications Union (ITU), is responsible for reconciling these technological requirements with the legal principles in the Outer Space Treaty.85 Importantly, also, the infrastructure and equipment on the moon is distinct from the site it may occupy. Article VIII of the Outer Space Treaty makes clear that States retain jurisdiction and control of their space objects, which would include all equipment and infrastructure.86 Both Article II and Article VIII are informed by Article XII which, as previously noted, expressly contemplates occupation of territory on the Moon under certain circumstances while also affording the right of free access to such installations on the basis of reciprocity.87 Hence, we have seen how the enabling concept finds support in the Outer Space Treaty while the constraining concept’s legal notions of common ownership do not – at least, not according to the legitimate and longstanding interpretation of the United States. The question of whether outer space is a global commons, therefore, demands a somewhat complicated answer. EO 13914, however, does not account for this complexity, nor do some of the justifications offered in its defense. For instance, when asked why EO 13914 refutes that space is a global commons, Dr. Pace explained, **“[s]ome view all shared domains beyond national sovereign jurisdiction and control as constituting a ‘global commons . . . [h]owever, this does not have a firm foundation in international space law, given that the concept of a ‘global commons’ is not part of the Outer Space Treaty**.” This rationale, in which **the premise assumes the truth of the conclusion rather than supports the conclusion**, does not account for the various legitimate meanings of global commons. Similarly, former White House Space Policy Director Peter Marquez has asserted that EO 13914 rejects the term “global commons” because “the DoD has errantly described space as a global commons despite legal guidance given by the White House and the State Department.”8 Mr. Marquez further explains: Previous Administrations have also rejected the concept of space as a global commons . . . then a few years ago the Department of Defense started stating that space was a global commons . . . the EO clearly states the USG [United States Government] position on this matter and hopefully will end the confusion about the USG’s true position on the matter . . . The world made its decision on these matters when only 18 nations decided to sign the Moon Agreement.90 This rationale appears to equate the rejection of the Moon Agreement with the rejection of the notion of outer space as a global commons. This is not necessarily accurate, however, unless one associates the meaning of “global commons” with the concept of the common heritage of mankind, because that is what was rejected along with the Moon Agreement.

#### 4) Silverstein and Panda aren’t about commons but rather managing a current politic of doing so – it doesn’t apply + 0 risk

#### 5) Second silverstein and panda card just indicates states can have the authority to legislate on things like air pollution, but that doesn’t prove they can for outer space – means the aff gets circumvented and fails

### Adv. 1

#### Don’t vote on an advantage with no real extinction impact justified by just nebulous internal links

#### 1) Wood is like 7 words long, lacks a real warrant, and also proves an alt cause because it acknowledges that there are about half that are not for commercial purposes so non-private appropriation like from states’ circumvents

#### 2) MunOz-Patchen is incorrect – this is in the context of small debris but their evidence misses an internal link between debris writ large and extremely tiny ones

#### 3) Creator of the Kessler syndrome admits that it’s way too far off to matter - Harker reads green

Chelsea **1AC MuñOz-Patchen, 19** - ("Regulating the Space Commons: Treating Space Debris as Abandoned Property in Violation of the Outer Space Treaty," University of Chicago, 2019, 12-6-2021, https://cjil.uchicago.edu/publication/regulating-space-commons-treating-space-debris-abandoned-property-violation-outer-space)//AW

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

#### 4) Johnson also doesn’t indicate that there is an external impact to any of these scenarios – means they don’t escalate and reading new terminals would be new in the 1AR just like reading an add-on—none of the warrants in the card are contextualized to nukes.

#### 5) Alt causes to Johnson they can’t solve – Harker reads green

Les 1AC Johnson 13, Deputy Manager for NASA's Advanced Concepts Office at the Marshall Space Flight Center, Co-Investigator for the JAXA T-Rex Space Tether Experiment and PI of NASA's ProSEDS Experiment, Master's Degree in Physics from Vanderbilt University, Popular Science Writer, and NASA Technologist, Frequent Contributor to the Journal of the British Interplanetary Sodety and Member of the American Institute of Aeronautics and Astronautics, National Space Society, the World Future Society, and MENSA, Sky Alert!: When Satellites Fail, p. 9-12 [language modified]

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

#### 6) The aff’s scenario is about the Kessler syndrome in the context of states so they don’t solve those either

#### 7) No debris cascades, but even a worst case is confined to low LEO with no impact

Daniel Von Fange 17, Web Application Engineer, Founder and Owner of LeanCoder, Full Stack, Polyglot Web Developer, “Kessler Syndrome is Over Hyped”, 5/21/2017, http://braino.org/essays/kessler\_syndrome\_is\_over\_hyped/

Kessler Syndrome is overhyped. A chorus of online commenters great any news of upcoming low earth orbit satellites with worry that humanity will to lose access to space. I now think they are wrong.

What is Kessler Syndrome?

Here’s the popular view on Kessler Syndrome. Every once in a while, a piece of junk in space hits a satellite. This single impact destroys the satellite, and breaks off several thousand additional pieces. These new pieces now fly around space looking for other satellites to hit, and so exponentially multiply themselves over time, like a nuclear reaction, until a sphere of man-made debris surrounds the earth, and humanity no longer has access to space nor the benefits of satellites.

It is a dark picture.

Is Kessler Syndrome likely to happen?

I had to stop everything and spend an afternoon doing back-of-the-napkin math to know how big the threat is. To estimate, we need to know where the stuff in space is, how much mass is there, and how long it would take to deorbit.

The orbital area around earth can be broken down into four regions.

Low LEO - Up to about 400km. Things that orbit here burn up in the earth’s atmosphere quickly - between a few months to two years. The space station operates at the high end of this range. It loses about a kilometer of altitude a month and if not pushed higher every few months, would soon burn up. For all practical purposes, Low LEO doesn’t matter for Kessler Syndrome. If Low LEO was ever full of space junk, we’d just wait a year and a half, and the problem would be over.

High LEO - 400km to 2000km. This where most heavy satellites and most space junk orbits. The air is thin enough here that satellites only go down slowly, and they have a much farther distance to fall. It can take 50 years for stuff here to get down. This is where Kessler Syndrome could be an issue.

Mid Orbit - GPS satellites and other navigation satellites travel here in lonely, long lives. The volume of space is so huge, and the number of satellites so few, that we don’t need to worry about Kessler here.

GEO - If you put a satellite far enough out from earth, the speed that the satellite travels around the earth will match the speed of the surface of the earth rotating under it. From the ground, the satellite will appear to hang motionless. Usually the geostationary orbit is used by big weather satellites and big TV broadcasting satellites. (This apparent motionlessness is why satellite TV dishes can be mounted pointing in a fixed direction. You can find approximate south just by looking around at the dishes in your northern hemisphere neighborhood.) For Kessler purposes, GEO orbit is roughly a ring 384,400 km around. However, all the satellites here are moving the same direction at the same speed - debris doesn’t get free velocity from the speed of the satellites. Also, it’s quite expensive to get a satellite here, and so there aren’t many, only about one satellite per 1000km of the ring. Kessler is not a problem here.

#### 8) It takes centuries and adaptation solves

Ted Muelhaupt 19, Associate Principal Director of the Systems Analysis and Simulation Subdivision (SASS) and Manager of the Center for Orbital and Reentry Debris Studies at The Aerospace Corporation, M.S., B.S. Aerospace and Aeronautical Engineering & Mechanics, University of Minnesota - Twin Cities, Senior Member of the American Institute of Aeronautics and Astronautics, “How Quickly Would It Take For the Kessler Syndrome To Destroy All The Satellites In LEO? And Could You See This Happening From Earth?”, Quora, 2/28/2019, https://www.quora.com/How-quickly-would-it-take-for-the-Kessler-Syndrome-to-destroy-all-the-satellites-in-LEO-And-could-you-see-this-happening-from-Earth

The dynamics of the Kessler Syndrome are real, and most people studying it agree on the concept: if there is sufficient density of objects and mass, a chain reaction of debris breaking up objects and creating more debris can occur. But the timescale of this process takes decades and centuries. There are many assumptions that go into these models. Though there is still argument about this, many people in the field think that the process is already underway in low earth orbit. But others, including myself, think we can stop it if we take action. This is a slow motion disaster that we can prevent.

But in spite of hype to the contrary, we will never “lose access to space”. Certain missions may become impractical or too expensive, and we may decide that some orbits are too risky for humans. Even that depends on the tolerance for the risk. But robots don’t have mothers, and if we feel it is worthwhile we will take the risk and fly the satellites where we need to.

To the specifics of the question, it will take many decades. It will not destroy all satellites in LEO. You won’t be able to see it from the ground unless you were extraordinarily lucky, and you happened to see a flash from a collision in the instant you were looking, with just the right lighting.

#### 9: “appropriation” includes “large-scale extraction of space resources.” Comprehensive analysis proves—development requires appropriation.

Leon 18 [Amanda, JD from UVA] “Mining for Meaning: An Examination of the Legality of Property Rights in Space Resources” Vol. 104:497, Virginia Law Review, <https://www.capdale.com/files/24323_leon_final_note.pdf>, 2018 RE

Employing the treaty interpretation tools of ordinary meaning, preparatory materials, historical context, state practice, and state interpretation offers many possible understandings of the obligations imparted by Articles I and II of the OST. For example, while the ordinary meaning of “use” could reasonably include the exploitation of materials, the meeting summaries of the Fifth Session of the U.N. Committee on the Peaceful Uses of Outer Space Legal Sub-Committee make clear that no consensus was ever reached regarding whether “use” includes large-scale exploitation of space resources, let alone fee-simple ownership and the ability to sell commercially. State practice dealing with extraterrestrial samples also sheds little light on the confusion, as the examples cited all deal instead with scientific samples of limited quantity. The international community’s rejection of the Moon Agreement also fails to bring clarity. While on the one hand the rejection could be read as a rejection of the idea that the OST prohibits private property rights, it could also be read as a rejection of the common heritage of mankind doctrine. Finally, the prospect of private venture space mining and extraterrestrial resource extraction remained far off and futuristic at the time of the Treaty’s negotiation, making drawing legal conclusions about the legality of these revolutionary activities extremely difficult.

Overall, however, the Treaty’s structure and its purposes (preserving peace and avoiding international conflict in outer space) ultimately indicate that private property rights in space resources are prohibited by Article II’s non-appropriation principle, at least until future international delegation determines otherwise (like in the Antarctic). The Treaty’s structure confirms this interpretation. Article I lays down a general rule for activity in space. Subsequent articles of the Treaty then lay out more specific requirements of and qualifications to this general rule. Much like Article IV restricts the use of nuclear weapons in space, Article II restricts the use of space in ways that might result in potentially controversial property claims. Historically, claims to mineral rights have resulted in just as contentious conflict as those over sovereign lands. Treaty efforts to avoid conflicts in Antarctica and the high seas reflect similar sentiments. The Soviet Union’s representative even hinted at this structural relationship between Articles I and II during Treaty negotiations.232 In light of the imminent need to ease Cold War tensions, the potential for conflict over property, and the final structure of the Treaty, this Note concludes that the large-scale extraction of space resources is incompatible with the non-appropriation principle of Article II of the OST.233 As a result, the United States’ provision of property rights to its citizens to possess, own, transport, use, and sell space and asteroid resources extracted through the SREU Act contravenes its international obligations established by the OST.

### Adv. 2

#### They don’t solve their own impacts – cap exists outside of space.

#### If the only thing sustaining cap is space appropriation, then the gov would fill in. They don’t articulate why private appropriation is worse.

#### Space resource fund cp solves inequality.

#### Replicating imperialism is just a metaphor – there aren’t people in space and the aff doesn’t solves colonialism.

#### Cap good

#### Cap is sustainable – innovation is key to solve the climate and the alt can’t solve

Karlsson 21 – Associate Professor in political science at Umea University (Rasmus, "Learning in the Anthropocene" Soc. Sci. 10, no. 6: 233. <https://doi.org/10.3390/socsci10060233> 18 June 2021)

Unpacking this argument, it is perhaps useful to first recognize that, stable as the Holocene may have seemed from a human perspective, life was always vulnerable to a number of cosmic risks, such as bolide collisions, risks that only advanced technologies can mitigate. Similarly, the Black Death of the 14th century should serve as a powerful reminder of the extreme vulnerability of pre-industrial societies at a microbiological level. Nevertheless, it is reasonable to think of the Holocene as providing a relatively stable baseline against which the ecological effects of technological interventions could hypothetically be evaluated. With most human activities being distinctively local, nature would for the most part “bounce back” (even if the deforestation of the Mediterranean basin during the Roman period is an example of that not always being the case) while larger geophysical processes, such as the carbon cycle, remained entirely beyond human intentional control. Even if there has been some debate about what influence human activities had on the preindustrial climate (Ruddiman 2007), anthropogenic forcing was in any case both marginal and gradual. All this changed with the onset of the Great Acceleration by which humans came to overwhelm the great forces of nature, causing untold damage to fragile ecosystems and habitats everywhere, forever altering the trajectory of life on the planet (Steffen et al. 2011b). In a grander perspective, humanity may one day become an interplanetary species and thus instrumental in safeguarding the long-term existence of biological life, but for the moment, its impact is ethically dubious at best as the glaciers melt, the oceans fill up with plastics, and vast number of species are driven to extinction. Faced with these grim realities, it is of course not surprising that the first impulse is to seek to restore some kind primordial harmony and restrain human activities. Yet, it is important to acknowledge that, even if their aggregate impact may have been within the pattern of Holocene variability, pre-modern Western agricultural societies were hardly “sustainable” in any meaningful sense. Experiencing permanent scarcity, violent conflict was endemic (Gat 2013), and as much as some contemporary academics like to attribute all evils to “capitalism” (Malm 2016), pre-capitalist societies exhibited no shortage of religious intolerance and other forms of social domination. It is thus not surprising that some have argued the need to reverse the civilizational arc further yet and return to a preliterate hunter-gather existence (Zerzan 2008) even if this, obviously, has very little to do with existing political realities and social formations. Under Holocene conditions, the short-term human tragedy may have been the same, but it did not undermine the long-term ability of the planet to support life. In a world of eight billion people, already accumulated emissions in the atmosphere have committed the planet to significant warming under the coming centuries, with an increasing probability that committed warming already exceeds the 1.5-degree target of the Paris Agreement even if all fossil-fuel emissions were to stop today (Mauritsen and Pincus 2017). This means that sustained negative emissions, presumably in combination with SRM, will most likely be needed just to stabilize global temperatures, not to mentioning countering the flow of future emissions. According to the Intergovernmental Panel on Climate Change (IPCC), assuming that all the pledges submitted under the Paris Agreement are fulfilled, limiting warming to 1.5 degrees will still require negative emissions in the range of 100—1000 gigatons of CO2 (Hilaire et al. 2019, p. 190). The removal of carbon dioxide at gigaton scales from the atmosphere will presumably require the existence of an advanced industrial society since low-tech options, such as afforestation, will be of limited use (Gundersen et al. 2021; Seddon et al. 2020), especially in a future of competing land-uses. It is against this backdrop of worsening climate harms that the limits of “precaution”, at least as conventionally understood, become apparent. While degrowth advocates tend to insist that behavioral change, even explicitly betting on a “social miracle” (Kallis 2019, p. 195), is always preferable to any technological risk-taking (Heikkurinen 2018), that overlooks both the scope of the sustainability challenge and the lack of public consent to any sufficiently radical political project (Buch-Hansen 2018). While there may be growing willingness to pay for, say, an electric vehicle (Hulshof and Mulder 2020), giving up private automobile use altogether is obviously a different animal, to say nothing about a more fundamental rematerialization of the economy (Hausknost 2020). Again, the problem is one in which change either (a) remains marginal yet ecologically insufficient or (b) becomes sufficiently radical yet provokes a strong political counterreaction. A similar dynamic can be expected to play out at the international level where countries that remain committed to growth would quickly gain a military advantage. To make matters worse, there is also a temporal element to this dynamic since any regime of frugality and localism would have to be policed indefinitely in order to prevent new unsustainable patterns of development from re-emerging later on. All this begs the obvious question, if the political and economic enforcement of the planetary boundaries are fraught with such political and social difficulties, would it not be better to instead try to transcend them through technological innovation? Surprisingly, any high-energy future would most likely be subject to many of the same motivational and psychological constraints that hinder a low-energy future. While history shows that existing nuclear technologies could in theory displace all fossil fuels and meet the most stringent climate targets (Qvist and Brook 2015), it seems extremely unlikely, to put it mildly, that thousands of new reactors will be built over the course of the coming decades in response to climate change. Outside the world of abstract computer modelling, real world psychological and cultural inertia tends to ensure that political decision-making, at least for the most part, gravitates to what is considered “reasonable” and “common sense”—such as medium emissions electricity grids in which wind and solar are backed by biomass and gas—rather than what any utilitarian optimization scenario may suggest. Even if the global benefits of climate stabilization would be immense, the standards by which local nuclear risks are assessed, as clearly illustrated by the Fukushima accident which led to a worldwide retreat from nuclear energy despite only causing one confirmed death (which, though obviously regrettable, has to be put in relation to the hundred and thousands of people dying every year from the use of fossil fuels), underscores the uneven distribution of perceived local risks versus global benefits and the associated problem of socio-political learning across spatial scales. Almost two decades ago, Ingolfur Blühdorn identified “simulative eco-politics” as a key strategy by which liberal democracies reconcile an ever-heightened rhetoric of environmental crisis with their simultaneous defense of the core principles of consumer capitalism (Blühdorn 2007). Since then, declarations that we only have “ten years to save the planet” have proliferated, and so have seemingly bold investments in renewable energy, most recently in the form of US President Joseph Biden’s USD 2.25 trillion climate and infrastructure plan. Still, without a meaningful commitment to either radical innovation or effective degrowth, it is difficult to see how the deployment of yet more wind turbines or the building of new highways will in any way be qualitatively different from what Blühdorn pertinently described as sustaining “what is known to be unsustainable” (Blühdorn 2007, p. 253). However, all is not lost in lieu of more authentic forms of eco-politics. Independent of political interventions, accelerating technological change, in particular with regard to computing and intelligent machine labor, may one day make large-scale precision manipulation of the physical world possible in ways that may solve many problems that today seem intractable (Dorr 2016). Similarly, breakthroughs in synthetic biology may hold the key to environmentally benign biofuels and carbon utilization technologies. Yet, all such progress remains hypothetical and uncertain for now. Given what is at stake, there is an obvious danger in submitting to naïve technological optimism. What is less commonly recognized is that naïve optimism with regard to the prospects of behavioral change may be equally dangerous. While late-capitalist affluence has enabled many postmaterial identities and behaviors, such as bicycling, hobby farming, and other forms of emancipatory self-expression, a collapsing economy could quickly lead to a reversal back to survivalist values, traditional hierarchical forms of domination, and violence (Quilley 2011, p. 77). As such, it is far from obvious what actions would actually take the world as a whole closer to long-term sustainability. If sustainability could be achieved by a relatively modest reduction in consumption rates or behavioral changes, such as a ban on all leisure flights, then there would be a strong moral case for embracing degrowth. Yet, recognizing how farreaching measures in terms of population control and consumption restrictions that would be needed, the case quickly becomes more ambiguous. While traditional environmentalism may suggest that retreating from the global economy and adopting a low-tech lifestyle would increase resilience (Alexander and Yacoumis 2018), it may do very much the opposite by further fragmenting global efforts and slowing the pace of technological innovation. Without an orderly and functioning world trade system, local resources scarcities would be exacerbated, as seen most recently with the different disruptions to vaccine supply chains. In essence, given the lack of a stable Holocene baseline to revert to, it becomes more difficult to distinguish proactionary “risk-taking” from “precaution”, especially as many ecosystems have already been damaged beyond natural recovery. In this context, it is noteworthy that many of the technologies that can be expected to be most crucial for managing a period of prolonged overshoot (such as next-generation nuclear, engineering biology, large-scale carbon capture and SRM) are also ones that traditional environmentalism is most strongly opposed to. 3. Finding Indicators From the vantage point of the far-future, at least the kind depicted in the fictional universe of Star Trek, human evolution is a fairly straightforward affair along an Enlightenment trajectory by which ever greater instrumental capacity is matched by similar leaps in psychological maturity and expanding circles of moral concern. With the risk of sounding Panglossian, one may argue that the waning of interstate war in general and the fact that there has not been any major nuclear exchange in particular, does vindicate such an optimistic reading of history. While there will always be ups and downs, as long as the most disastrous outcomes are avoided, there will still be room for learning and gradual political accommodation. Taking such a longer view, it would nevertheless be strange if development was simply linear, that former oppressors would just accept moral responsibility or that calls for gender or racial justice would not lead to self-reinforcing cycles of conservative backlash and increasingly polarizing claims. Still, over the last couple of centuries, there is little doubt that human civilization has advanced significantly, both technologically and ethically (Pinker 2011), at least from a liberal and secular perspective. However, unless one subscribes to teleology, there is nothing inexorable with this development and, it may be that the ecological, social, and political obstacles are simply too great to ever allow for the creation of a Wellsian borderless world (Pedersen 2015) that would allow everyone to live a life free from material want and political domination. On the other hand, much environmental discourse tends to rush ahead in the opposite direction and treat the c limate crisis as ultimate evidence of humanity’s fallen nature when the counter-factual case, that it would be possible for a technological civilization to emerge without at some point endangering its biophysical foundations, would presumably be much less plausible. From an astrobiological perspective, it is easy to imagine how the atmospheric chemistry of a different planet would be more volatile and thus more vulnerable to the effects of industrial processes (Haqq-Misra and Baum 2009), leaving a shorter time window for mitigation. Nick Bostrom has explored this possibility of greater climate sensitivity further in his “vulnerable world hypothesis” (Bostrom 2019) and it begs to reason that mitigation efforts would be more focused in such a world. However, since climate response times are longer and sensitivity less pronounced, climate mitigation policies have become mired in culture and media politics (Newman et al. 2018) but also a statist logic (Karlsson 2018) by which it has become more important for states to focus on their own marginal emission reductions in the present rather than asking what technologies would be needed to stabilize the climate in a future where all people can live a modern life.

#### Warming causes extinction

Klein 14[(Naomi Klein, award-winning journalist, syndicated columnist, former Miliband Fellow at the London School of Economics, member of the board of directors of 350.org), *This Changes Everything: Capitalism vs. the Climate*, pp. 12-14]

In a 2012 report, the World Bank laid out the gamble implied by that target. “As global warming approaches and exceeds 2-degrees Celsius, there is a risk of triggering nonlinear tipping elements. Examples include the disintegration of the West Antarctic ice sheet leading to more rapid sea-level rise, or large-scale Amazon dieback drastically affecting ecosystems, rivers, agriculture, energy production, and livelihoods. This would further add to 21st-century global warming and impact entire continents.” In other words, once we allow temperatures to climb past a certain point, where the mercury stops is not in our control.¶ But the bigger problem—and the reason Copenhagen caused such great despair—is that because governments did not agree to binding targets, they are free to pretty much ignore their commitments. Which is precisely what is happening. Indeed, emissions are rising so rapidly that unless something radical changes within our economic structure, 2 degrees now looks like a utopian dream. And it’s not just environmentalists who are raising the alarm. The World Bank also warned when it released its report that “we’re on track to a 4-C warmer world [by century’s end] marked by extreme heat waves, declining global food stocks, loss of ecosystems and biodiversity, and life-threatening sea level rise.” And the report cautioned that, “there is also no certainty that adaptation to a 4-C world is possible.” Kevin Anderson, former director (now deputy director) of the Tyndall Centre for Climate Change, which has quickly established itself as one of the U.K’s premier climate research institutions, is even blunter; he says 4 degrees Celsius warming—7.2 degrees Fahrenheit—is “incompatible with an organized, equitable, and civilized global community.”¶ We don’t know exactly what a 4 degree Celsius world would look like, but even the best-case scenario is likely to be calamitous. Four degrees of warming could raise global sea levels by 1 or possibly even 2 meters by 2100 (and would lock in at least a few additional meters over future centuries). This would drown some island nations such as the Maldives and Tuvalu, and inundate many coastal areas from Ecuador and Brazil to the Netherlands to much of California and the northeastern United States as well as huge swaths of South and Southeast Asia. Major cities likely in jeopardy include Boston, New York, greater Los Angeles, Vancouver, London, Mumbai, Hong Kong, and Shanghai.¶ Meanwhile, brutal heat waves that can kill tens of thousands of people, even in wealthy countries, would become entirely unremarkable summer events on every continent but Antarctica. The heat would also cause staple crops to suffer dramatic yield losses across the globe (it is possible that Indian wheat and U.S. could plummet by as much as 60 percent), this at a time when demand will be surging due to population growth and a growing demand for meat. And since crops will be facing not just heat stress but also extreme events such as wide-ranging droughts, flooding, or pest outbreaks, the losses could easily turn out to be more severe than the models have predicted. When you add ruinous hurricanes, raging wildfires, fisheries collapses, widespread disruptions to water supplies, extinctions, and globe-trotting diseases to the mix, it indeed becomes difficult to imagine that a peaceful, ordered society could be sustained (that is, where such a thing exists in the first place).¶ And keep in mind that these are the optimistic scenarios in which warming is more or less stabilized at 4 degrees Celsius and does not trigger tipping points beyond which runaway warming would occur. Based on the latest modeling, it is becoming safer to assume that 4 degrees could bring about a number of extremely dangerous feedback loops—an Arctic that is regularly ice-free in September, for instance, or, according to one recent study, global vegetation that is too saturated to act as a reliable “sink”, leading to more carbon being emitted rather than stored. Once this happens, any hope of predicting impacts pretty much goes out the window. And this process may be starting sooner than anyone predicted. In May 2014, NASA and the University of California, Irvine scientists revealed that glacier melt in a section of West Antarctica roughly the size of France now “appears unstoppable.” This likely spells down for the entire West Antarctic ice sheet, which according to lead study author Eric Rignot “comes with a sea level rise between three and five metres. Such an event will displace millions of people worldwide.” The disintegration, however, could unfold over centuries and there is still time for emission reductions to slow down the process and prevent the worst. ¶ Much more frightening than any of this is the fact that plenty of mainstream analysts think that on our current emissions trajectory, we are headed for even more than 4 degrees of warming. In 2011, the usually staid International Energy Agency (IEA) issued a report predicting that we are actually on track for 6 degrees Celsius—10.8 degrees Fahrenheit—of warming. And as the IEA’s chief economist put it: “Everybody, even the school children, knows that this will have catastrophic implications for all of us.” (The evidence indicates that 6 degrees of warming is likely to set in motion several major tipping points—not only slower ones such as the aforementioned breakdown of the West Antarctic ice sheet, but possibly more abrupt ones, like massive releases of methane from Arctic permafrost.) The accounting giant PricewaterhouseCoopers as also published a report warning businesses that we are headed for “4-C , or even 6-C” of warming.¶ These various projections are the equivalent of every alarm in your house going off simultaneously. And then every alarm on your street going off as well, one by one by one. They mean, quite simply, that climate change has become an existential crisis for the human species. The only historical precedent for a crisis of this depth and scale was the Cold War fear that we were headed toward nuclear holocaust, which would have made much of the planet uninhabitable. But that was (and remains) a threat; a slim possibility, should geopolitics spiral out of control. The vast majority of nuclear scientists never told us that we were almost certainly going to put our civilization in peril if we kept going about our daily lives as usual, doing exactly what we were already going, which is what climate scientists have been telling us for years. ¶ As the Ohio State University climatologist Lonnie G. Thompson, a world-renowned specialist on glacier melt, explained in 2010, “Climatologists, like other scientists, tend to be a stolid group. We are not given to theatrical rantings about falling skies. Most of us are far more comfortable in our laboratories or gathering data in the field than we are giving interviews to journalists or speaking before Congressional committees. When then are climatologists speaking out about the dangers of global warming? The answer is that virtually all of us are now convinced that global warming poses a clear and present danger to civilization.”

## 3

#### Strong commercial space catalyzes tech innovation – progress at the margins and spinoff tech change global information networks

Joshua Hampson 2017, Security Studies Fellow at the Niskanen Center, 1-25-2017, “The Future of Space Commercialization”, Niskanen Center, https://republicans-science.house.gov/sites/republicans.science.house.gov/files/documents/TheFutureofSpaceCommercializationFinal.pdf

Innovation is generally hard to predict; some new technologies seem to come out of nowhere and others only take off when paired with a new application. It is difficult to predict the future, but it is reasonable to expect that a growing space economy would open opportunities for technological and organizational innovation. In terms of technology, the difficult environment of outer space helps incentivize progress along the margins. Because each object launched into orbit costs a significant amount of money—at the moment between $27,000 and $43,000 per pound, though that will likely drop in the future —each 19 reduction in payload size saves money or means more can be launched. At the same time, the ability to fit more capability into a smaller satellite opens outer space to actors that previously were priced out of the market. This is one of the reasons why small, affordable satellites are increasingly pursued by companies or organizations that cannot afford to launch larger traditional satellites. These small 20 satellites also provide non-traditional launchers, such as engineering students or prototypers, the opportunity to learn about satellite production and test new technologies before working on a full-sized satellite. That expansion of developers, experimenters, and testers cannot but help increase innovation opportunities. Technological developments from outer space have been applied to terrestrial life

since the earliest days of space exploration. The National Aeronautics and Space Administration (NASA) maintains a website that lists technologies that have spun off from such research projects. Lightweight 21 nanotubes, useful in protecting astronauts during space exploration, are now being tested for applications in emergency response gear and electrical insulation. The need for certainty about the resiliency of materials used in space led to the development of an analytics tool useful across a range of industries. Temper foam, the material used in memory-foam pillows, was developed for NASA for seat covers. As more companies pursue their own space goals, more innovations will likely come from the commercial sector. Outer space is not just a catalyst for technological development. Satellite constellations and their unique line-of-sight vantage point can provide new perspectives to old industries. Deploying satellites into low-Earth orbit, as Facebook wants to do, can connect large, previously-unreached swathes of 22 humanity to the Internet. Remote sensing technology could change how whole industries operate, such as crop monitoring, herd management, crisis response, and land evaluation, among others. 23 While satellites cannot provide all essential information for some of these industries, they can fill in some useful gaps and work as part of a wider system of tools. Space infrastructure, in helping to change how people connect and perceive Earth, could help spark innovations on the ground as well. These innovations, changes to global networks, and new opportunities could lead to wider economic growth.

#### Tech innovation solves every existential threat – cumulative extinction events outweigh the aff

Dylan **Matthews 18**. Co-founder of Vox, citing Nick Beckstead @ Rutgers University. 10-26-2018. "How to help people millions of years from now." Vox. https://www.vox.com/future-perfect/2018/10/26/18023366/far-future-effective-altruism-existential-risk-doing-good

If you care about improving human lives, you should overwhelmingly care about those quadrillions of lives rather than the comparatively small number of people alive today. The 7.6 billion people now living, after all, amount to less than 0.003 percent of the population that will live in the future. It’s reasonable to suggest that those quadrillions of future people have, accordingly, hundreds of thousands of times more moral weight than those of us living here today do. That’s the basic argument behind Nick Beckstead’s 2013 Rutgers philosophy dissertation, “On the overwhelming importance of shaping the far future.” It’s a glorious mindfuck of a thesis, not least because Beckstead shows very convincingly that this is a conclusion any plausible moral view would reach. It’s not just something that weird utilitarians have to deal with. And Beckstead, to his considerable credit, walks the walk on this. He works at the Open Philanthropy Project on grants relating to the far future and runs a charitable fund for donors who want to prioritize the far future. And arguments from him and others have turned “long-termism” into a very vibrant, important strand of the effective altruism community. But what does prioritizing the far future even mean? The most literal thing it could mean is preventing human extinction, to ensure that the species persists as long as possible. For the long-term-focused effective altruists I know, that typically means identifying concrete threats to humanity’s continued existence — like unfriendly artificial intelligence, or a pandemic, or global warming/out of control geoengineering — and engaging in activities to prevent that specific eventuality. But in a set of slides he made in 2013, Beckstead makes a compelling case that while that’s certainly part of what caring about the far future entails, approaches that address specific threats to humanity (which he calls “targeted” approaches to the far future) have to complement “broad” approaches, where instead of trying to predict what’s going to kill us all, you just generally try to keep civilization running as best it can, so that it is, as a whole, well-equipped to deal with potential extinction events in the future, not just in 2030 or 2040 but in 3500 or 95000 or even 37 million. In other words, caring about the far future doesn’t mean just paying attention to low-probability risks of total annihilation; it also means acting on pressing needs now. For example: We’re going to be better prepared to prevent extinction from AI or a supervirus or global warming if society as a whole makes a lot of scientific progress. And a significant bottleneck there is that the vast majority of humanity doesn’t get high-enough-quality education to engage in scientific research, if they want to, which reduces the odds that we have enough trained scientists to come up with the breakthroughs we need as a civilization to survive and thrive. So maybe one of the best things we can do for the far future is to improve school systems — here and now — to harness the group economist Raj Chetty calls “lost Einsteins” (potential innovators who are thwarted by poverty and inequality in rich countries) and, more importantly, the hundreds of millions of kids in developing countries dealing with even worse education systems than those in depressed communities in the rich world. What if living ethically for the far future means living ethically now? Beckstead mentions some other broad, or very broad, ideas (these are all his descriptions): Help make computers faster so that people everywhere can work more efficiently Change intellectual property law so that technological innovation can happen more quickly Advocate for open borders so that people from poorly governed countries can move to better-governed countries and be more productive Meta-research: improve incentives and norms in academic work to better advance human knowledge Improve education Advocate for political party X to make future people have values more like political party X ”If you look at these areas (economic growth and technological progress, access to information, individual capability, social coordination, motives) a lot of everyday good works contribute,” Beckstead writes. “An implication of this is that a lot of everyday good works are good from a broad perspective, even though hardly anyone thinks explicitly in terms of far future standards.” Look at those examples again: It’s just a list of what normal altruistically motivated people, not effective altruism folks, generally do. Charities in the US love talking about the lost opportunities for innovation that poverty creates. Lots of smart people who want to make a difference become scientists, or try to work as teachers or on improving education policy, and lord knows there are plenty of people who become political party operatives out of a conviction that the moral consequences of the party’s platform are good. All of which is to say: Maybe effective altruists aren’t that special, or at least maybe we don’t have access to that many specific and weird conclusions about how best to help the world. If the far future is what matters, and generally trying to make the world work better is among the best ways to help the far future, then effective altruism just becomes plain ol’ do-goodery.\*