Framing

Pleasure is intrinsically valuable. People consistently regard pleasure and pain as good reasons for action, despite the fact that pleasure doesn't seem to be instrumentally valuable for anything. Moen '16

Moen 16 [(Ole Martin Moen, Research Fellow in Philosophy at University of Oslo) "An Argument for Hedonism," Journal of Value Inquiry (Springer), 50 (2) 2016: 267–281, https://link.springer.com/article/10.1007/s10790-015-9506-9] TDI Ole Martin Moen is a Norwegian philosopher who works primarily with applied ethics and value theory.

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

Extinction outweighs

GPP 17 (Global Priorities Project, Future of Humanity Institute at the University of Oxford, Ministry for Foreign Affairs of Finland, "Existential Risk: Diplomacy and Governance," Global Priorities Project, 2017, https://www.fhi.ox.ac.uk/wp-content/uploads/Existential-Risks-2017-01-23.pdf

1.2. THE ETHICS OF EXISTENTIAL RISK In his book Reasons and Persons, Oxford philosopher Derek Parfit advanced an influential argument about the importance of avoiding extinction: I believe that if we destroy mankind, as we now can, this outcome will be much worse than most people think. Compare three outcomes: (1) Peace. (2) A nuclear war that kills 99% of the world's existing population. (3) A nuclear war that kills 100%. (2) would be worse than (1), and (3) would be worse than (2). Which is the greater of these two differences? Most people believe that the greater difference is between (1) and (2). I believe that the difference between (2) and (3) is very much greater. … The Earth will remain habitable for *at least another billion years.* Civilization began only a few thousand years ago. If we do not destroy mankind, these few thousand years may be only *a tiny fraction* of the whole of civilized human history.

The difference between (2) and (3) may thus be the difference between this tiny fraction and all of the rest of this history. If we compare this possible history to a day, what has occurred so far is only a *fraction of a second*.65 In this argument, it seems that Parfit is assuming that the survivors of a nuclear war that kills 99% of the population would eventually be able to recover civilisation without long-term effect. As we have seen, this may not be a safe assumption – but for the purposes of this thought experiment, the point stands. What makes existential catastrophes especially bad is that they would "*destroy the future*," as another Oxford philosopher, Nick Bostrom, puts it.66 **This future could potentially be extremely long and full of flourishing, and would therefore have extremely large value. In standard risk analysis,** when working out how to respond to risk, we work out the expected value of risk reduction, by weighing the probability that an action will prevent an adverse event against the severity of the event. Because the value of preventing existential catastrophe is so vast, even a tiny probability of prevention has huge expected value.67 Of course, there is persisting reasonable disagreement about ethics and there are a number of ways one might resist this conclusion.68 Therefore, it would be unjustified to be overconfident in Parfit and Bostrom's argument. In some areas, government policy does give significant weight to future generations. **For example, in assessing the risks of nuclear waste storage, governments have considered timeframes of thousands, hundreds of thousands, and even a million years.**69 Justifications for this policy usually appeal to principles of intergenerational equity according to which future generations ought to get as much protection as current generations.70 Similarly, widely accepted norms of sustainable development require development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs.71 **However, when it comes to existential risk, it would seem that we fail to live up to principles of intergenerational equity**. **Existential catastrophe would not only give future generations less than the current generations; *it would give them nothing***. Indeed, reducing existential risk plausibly has a quite low cost for us in comparison with the huge expected value it has for future generations. In spite of this, relatively little is done to reduce existential risk. Unless we give up on norms of intergenerational equity, they give us a strong case for significantly increasing our efforts to reduce existential risks. 1.3. WHY EXISTENTIAL RISKS MAY BE SYSTEMATICALLY UNDERINVESTED IN, AND THE ROLE OF THE INTERNATIONAL COMMUNITY In spite of the importance of existential risk reduction, it probably receives less attention than is warranted. As a result, concerted international cooperation is required if we are to receive adequate protection from existential risks. 1.3.1. Why existential risks are likely to be underinvested in There are several reasons why existential risk reduction is likely to be underinvested in. Firstly, it is a global public good. Economic theory predicts that such goods tend to be underprovided. The benefits of existential risk reduction are widely and indivisibly dispersed around the globe from the countries responsible for taking action. Consequently, a country which reduces existential risk gains only a small portion of the benefits but bears the full brunt of the costs. Countries thus have strong incentives to free ride, receiving the benefits of risk reduction without contributing. As a result, too few do what is in the common interest. Secondly, as already suggested above, existential risk reduction is an intergenerational public good: most of the benefits are enjoyed by future generations who have no say in the political process. For these goods, the problem is temporal free riding: the current generation enjoys the benefits of inaction while future generations bear the costs. Thirdly, many existential risks, such as machine superintelligence, engineered pandemics, and solar geoengineering, pose an unprecedented and uncertain future threat. Consequently, it is hard to develop a satisfactory governance regime for them: there are few existing governance instruments which can be applied to these risks, and it is unclear what shape new instruments should take. In this way, our position with regard to these emerging risks is comparable to the one we faced when nuclear weapons first became available. Cognitive biases also lead people to underestimate existential risks. Since there have not been any catastrophes of this magnitude, these risks are not salient to politicians and the public.72 This is an example of the misapplication of the availability heuristic, a mental shortcut which assumes that something is important only if it can be readily recalled. Another cognitive bias affecting perceptions of existential risk is scope neglect. In a seminal 1992 study, three groups were asked how much they would be willing to pay to save 2,000, 20,000 or 200,000 birds from drowning in uncovered oil ponds. The groups answered $80, $78, and $88, respectively.73 In this case, the size of the benefits had little effect on the scale of the preferred response. People become numbed to the effect of saving lives when the numbers get too large. **74** Scope neglect is a particularly acute problem for existential risk because the numbers at stake are so large. Due to scope neglect, decision-makers are prone to treat existential risks in a similar way to problems which are less severe by many orders of magnitude. A wide range of other cognitive biases

Thus, the framework is consequentialism, and the criterion is maximizing pleasure and minimizing pain.

Prefer:

I'll define appropriation the same way the Outer Space Treaty does

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Based on the premise of '*res communis*', the magna carta of space law, the OST, illustrates outer space as "the province of all mankind".[I] Under Article I, States are free to explore and use outer space and to access all celestial bodies "on the basis of equality and in accordance with international law."[I[i]] Although the OST does not explicitly mention "mining" activities, under Article II, outer space including the Moon and other celestial bodies are "not subject to national appropriation by claim of sovereignty" **through use, occupation or any other means.**[lii] Furthermore, the Moon Agreement, 1979, not only defines outer space as "common heritage of mankind" but also proscribes commercial exploitation of planets and asteroids by States unless an international regime is established to govern such activities for "rational management," "equitable sharing" and "expansion of opportunities" in the use of these resources.[liii]

Advantage: Cybersecurity

Cybersecurity in space isn't sufficient - commercialization is a target of cyber attacks. Fidler '18

Fidler, D. P. (2018, April 3). *Cybersecurity and the New Era of Space Activities*. Council on Foreign Relations. Retrieved December 26, 2021, from https://www.cfr.org/report/cybersecurity-and-new-era-space-activities#chapter-title-0-1 David P. Fidler is senior fellow for global health and cybersecurity at the Council on Foreign Relations. He is an expert in international law, cybersecurity, national security, terrorism, counterinsurgency, international trade, biosecurity, and global health.

Outer space has been a national security priority for spacefaring nations since the 1950s. Governments started space programs for intelligence, military, political, and scientific purposes and developed countermeasures against space-based threats from rivals, such as anti-satellite capabilities. Countries managed security competition by banning weapons of mass destruction in space and cooperating on peaceful uses of space. Government programs catalyzed private-sector adaptation of dual-use technologies to provide satellite communication services.

Despite the importance of satellites, the U.S. General Accounting Office concluded [PDF] in 2002 that efforts on critical infrastructure protection did not include the satellite industry, but should do so. Similarly, cybersecurity has not been a priority in government and private-sector space endeavors. One leading analysis [PDF] asserted that cybersecurity discussions often overlook space activities' vulnerability to cyberattack. For example, neither the UN governmental group of experts (GGE) on outer space nor the UN GGE on cyberspace addressed the convergence of their respective agendas.

Governments, critical infrastructure, and economies rely on space-dependent services—for example, the Global Positioning System (GPS)—that are vulnerable to hostile cyber operations. Geopolitical competition fuels the militarization of space, which heightens state incentives to devise cyber espionage, interference, and attack strategies against rivals' space operations. The United States suspects that China has engaged in cyber operations against U.S. satellites. Chinese military writings emphasize [PDF] the need to target satellites to "blind and deafen the enemy." The then commander of Air Force Space Command, General John E. Hyten, told Congress in 2016 that "adversaries are developing . . . cyber tools to deny, degrade, and destroy" [PDF] U.S. space capabilities that support war fighting, critical infrastructure, and economic activity. Other countries likely believe the United States is preparing to conduct cyber espionage, disruption, and attack operations against the space assets of rival states.

The commercialization of space heightens cybersecurity concerns for many reasons, including market incentives to lower costs and innovate quickly, often at the expense of software and hardware security. Entrepreneurial activities—dubbed the New Space sector—are underway in space transport, space tourism, asteroid mining, lunar operations, and missions to Mars. A small-satellite ("smallsat") revolution involving spacecraft far smaller than traditional satellites is unfolding. Networks of linked smallsats can provide internet access, communications, data storage and transmission, imaging, and remote sensing. This next generation of satellites harnesses innovations in computing, electronics, miniaturization, imaging, sensors, big data, and artificial intelligence. Satellite services for Earth observations from space are growing. They support many policy

and commercial purposes and contribute to agricultural productivity, transportation efficiency, and environmental monitoring. Commercial space activities use cutting-edge technologies and produce valuable data and are, thus, targets for cyber espionage, including economic cyber espionage, and cybercrime.

Challenges

Space agencies, the satellite industry, cybersecurity researchers, nongovernmental bodies, and intergovernmental satellite organizations show increasing awareness of the space cybersecurity challenge. Nevertheless, experts are worried. NASA's then chief information security officer, Jeanette Hanna-Ruiz, warned that "it's a matter of time before someone hacks into something in space." Chatham House's David Livingstone asserted that "people are just shuffling . . . paper around" and suggested that only "a disaster" might catalyze serious action. Josh Hartman, a former senior Pentagon official and Air Force officer, argued before the satellite industry's first cybersecurity summit held in 2017 that, on cybersecurity, "most of the space community . . . has their heads in the sand." The "attack surface" of space activities is expanding, but governments and industry are not taking adequate action.

Protecting space activities requires understanding the particular cyber vulnerabilities that arise in various space operations. For example, satellite cybersecurity encompasses the satellite itself, transmissions to and from Earth, and ground stations. U.S. military and intelligence satellite systems are vulnerable to kinetic and cyberattacks. Civilian smallsat systems might also prove insecure, given the lack of cybersecurity in their design, their use of commercial off-the-shelf components, and the vulnerabilities potentially created by connecting satellites to operate as complex, orbiting networks.

Neither international law nor diplomacy has grappled effectively with space cybersecurity. Multiple bodies of international law are relevant, but controversies about whether and how international law applies to cyberspace have adversely affected cyber diplomacy. Such travails have elevated the prominence of nongovernmental efforts to clarify international law's application in cyberspace, such as the *Tallinn Manual 2.0 on the International Law Applicable to Cyber Operations*. However, states continue to conduct cyber operations that violate international law. For example, the UN International Telecommunication Union prohibits interference with satellite transmissions, yet such interference frequently occurs.

It's especially bad in Low earth orbit (LEO)

> Verco, E. (2021). *Anu jolt vol 2 issue 2 - LS 20211207*. https://anujolt.org/article/30203.pdf. Retrieved February 4, 2022, from https://anujolt.org/article/30203.pdf EDWARD VERCO is a law graduate of the University of Adelaide and a lawyer admitted to practice in the Supreme Court of South Australia. He is currently employed as a Contracts Management Associate at Lockheed Martin Australia, and his research areas of interest include regulation in the space and cybersecurity sectors, as well as the defence industry in general.

The cybersecurity of satellites requires significant improvement. Smallsats and CubeSats present particular vulnerabilities to cyberattacks, predominantly due to their minimal construction costs for

commercial entities. The deployment of thousands of satellites in constellations overcrowds low Earth orbit, which, coalesced with the presence of military satellites, provides attractive opportunities for malicious actors. Compromising a satellite could result in substantial economic disaster, as well as loss of life. Private corporations have failed to engage with cybersecurity, potentially due to a lack of awareness. This is compounded by the cost of adequately securing their satellites against cyberattacks and the absence of regulation. This is an immediate practical problem that requires urgent action. Employment of further encryption, such as quantum encryption, will significantly harden the cybersecurity of satellites against these risks. Alternative solutions include the development of laser-based communication and concerted focus on strengthening both intrusion detection systems (IDS) and intrusion prevention systems (IPS). Enforcement of such measures is required, and hence, improvement to the regulatory regime regarding the cybersecurity of satellites must urgently be enacted. Current international space law does not adequately address issues of cybersecurity and does not protect satellites from cyberthreats. An international multilateral space cybersecurity regime should be developed, which could be implemented by initially engaging existing intergovernmental organisations. Australia can demonstrate its value as a global leader in space cybersecurity regulation by developing its own comprehensive domestic system, requiring a minimal level of cybersecurity for all satellites. Australia's capabilities in high-technology cybersecurity position the nation favourably to develop a sophisticated regime of cybersecurity regulation for satellites.

The time to act is now - space privatization makes cyber attacks more dangerous and likely. Khalili 9/18/21

> Khalili, J. (2021, September 18). *Kamikaze satellites and Shuttles Adrift: Why Cyberattacks are a major threat to humanity's ambitions in space*. TechRadar. Retrieved December 26, 2021, from https://www.techradar.com/news/kamikaze-satellites-and-shuttles-adrift-why-cyberattacks-are-a-major-threat-to-our-ambitions-in-space

No matter how well space infrastructure is protected, however, criminals will find a way to launch attacks. The question then becomes: who and why?

Only a matter of time

At the moment, the incentives for cyber actors to launch attacks against space infrastructure are relatively few. With little opportunity to generate revenue, only a minority of hackers are likely to be interested.

The current space cybercrime landscape is dominated by state-sponsored actors, Yamout told us. These individuals or groups are not in it for money, but rather information that might accelerate domestic space research or provide an intelligence advantage over a rival nation. At a stretch, cyber mercenaries employed by private businesses may also be involved in intelligence gathering activities at this stage.

However, as the number of private businesses operating in space increases (think space mining and telecommunications, as well as tourism), the door will open to a variety of different kinds of attack, from a wider range of actors.

"Cybercriminals are only really interested in making money," explained Yamout. "Once space is commercialized and technology becomes sophisticated enough to install malware, criminals will be able to deploy ransomware against critical infrastructure, for example."

"This is a big deal, because infrastructure in space costs a lot of money and is not easy to replace, so criminals will have significant leverage in negotiations."

The fundamental principles of cybercrime are the same in space as they are on earth. As money floods into the sector, it's likely that some of it will flow into the pockets of cybercriminals too.

It's even likely, he says, that hacktivists and script kiddies (amateur hackers looking to hone their craft) could cause problems, launching nuisance attacks that bypass the basic levels of protection, if only to prove that it's possible.

Cyberattacks spiral to all-out nuclear conflict.

Klare 19 [Michael; November 2019; Professor emeritus of peace and world security studies at Hampshire College; "Cyber Battles, Nuclear Outcomes? Dangerous New Pathways to Escalation," Arms Control Association, https://www.armscontrol.org/act/2019-11/features/cyber-battles-nuclear-outcomes-dangerous-new-pathways-escalation]

Yet another pathway to escalation could arise from a cascading series of cyberstrikes and counterstrikes against vital national infrastructure rather than on military targets. All major powers, along with Iran and North Korea, have developed and deployed cyberweapons designed to disrupt and destroy major elements of an adversary's key economic systems, such as power grids, financial systems, and transportation networks. As noted, Russia has infiltrated the U.S. electrical grid, and it is widely believed that the United States has done the same in Russia.12 The Pentagon has also devised a plan known as "Nitro Zeus," intended to immobilize the entire Iranian economy and so force it to capitulate to U.S. demands or, if that approach failed, to pave the way for a crippling air and missile attack.13 The danger here is that economic attacks of this sort, if undertaken during a period of tension and crisis, could lead to an escalating series of tit-for-tat attacks against ever more vital elements of an adversary's critical infrastructure, producing widespread chaos and harm and eventually leading one side to initiate kinetic attacks on critical military targets, risking the slippery slope to nuclear conflict. For example, a Russian cyberattack on the U.S. power grid could trigger U.S. attacks on Russian energy and financial systems, causing widespread disorder in both countries and generating an impulse for even more devastating attacks. At some point, such attacks "could lead to major conflict and possibly nuclear war."14

Nuke war causes extinction AND outweighs *other* existential risks

PND 16. internally citing Zbigniew Brzezinski, Council of Foreign Relations and former national security adviser to President Carter, Toon and Robock's 2012 study on nuclear winter in the Bulletin of Atomic Scientists, Gareth Evans' International Commission on Nuclear Non-proliferation and Disarmament Report, Congressional EMP studies, studies on nuclear winter by Seth Baum of the Global Catastrophic Risk Institute and Martin Hellman of Stanford University, and U.S. and Russian former Defense Secretaries and former heads of nuclear missile forces, brief submitted to the United Nations General Assembly, Open-Ended Working Group on nuclear risks. A/AC.286/NGO/13. 05-03-2016.
http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/OEWG/2016/Documents/NGO13.pdf

Consequences human survival 12. Even if the 'other' side does NOT launch in response the smoke from 'their' burning cities (incinerated by 'us') will still make 'our' country (and the rest of the world) uninhabitable, potentially inducing global famine lasting up to decades. Toon and Robock note in 'Self Assured Destruction', in the Bulletin of Atomic Scientists 68/5, 2012, that: 13. "A nuclear war between Russia and the United States, even after the arsenal reductions planned under New START, could produce a nuclear winter. Hence, an attack by either side could be suicidal, resulting in self assured destruction. Even a 'small' nuclear war between India and Pakistan, with each country detonating 50 Hiroshima-size atom bombs--only about 0.03 percent of the global nuclear arsenal's explosive power--as air bursts in urban areas, could produce so much smoke that temperatures would fall below those of the Little Ice Age of the fourteenth to nineteenth centuries, shortening the growing season around the world and threatening the global food supply. Furthermore, there would be massive ozone depletion, allowing more ultraviolet radiation to reach Earth's surface. Recent studies predict that agricultural production in parts of the United States and China would decline by about 20 percent for four years, and by 10 percent for a decade." 14. A conflagration involving USA/NATO forces and those of Russian federation would most likely cause the deaths of most/nearly all/all humans (and severely impact/extinguish other species) as well as destroying the delicate interwoven techno-structure on which latter-day 'civilization' has come to depend. Temperatures would drop to below those of the last ice-age for up to 30 years as a result of the lofting of up to 180 million tonnes of very black soot into the stratosphere where it would remain for decades. 15. Though human ingenuity and resilience shouldn't be underestimated, human survival itself is arguably problematic, to put it mildly, under a 2000+ warhead USA/Russian federation scenario. 16. The Joint Statement on Catastrophic Humanitarian Consequences signed October 2013 by 146 governments mentioned 'Human Survival' no less than 5 times. The most recent (December 2014) one gives it a highly prominent place. Gareth Evans' ICNND (International Commission on Nuclear Non-proliferation and Disarmament) Report made it clear that it saw the threat posed by nuclear weapons use as one that at least threatens what we now call 'civilization' and that potentially threatens human survival with an immediacy that even climate change does not, though we can see the results of climate change here and now and of course the immediate post-nuclear results for Hiroshima and Nagasaki as well.

Advantage: Ozone

Starlink sends sats into LEO

> Loren Grush is a science reporter who specializes in all things space—from distant stars and planets to human space flight and the commercial space race. She is also the host of Space Craft, an original online video series that examines what it takes to send people to space. Loren published stories in Popular Science, The New York Times, Nautilus Magazine, Digital Trends, Fox News, and ABC News.
>
> Grush, L. (2021, November 11). *SpaceX's Starlink reveals new smaller, rectangular user dish to connect to satellites*. The Verge. Retrieved January 30, 2022, from https://www.theverge.com/2021/11/11/22776563/spacex-starlink-rectangular-dish-router-mounting-internet-satellites#:~:text=Starlink%20is%20SpaceX's%20satellite%20internet,traditional%20internet%20infrastructure%20is%20lacking.

SpaceX's internet-from-space initiative Starlink has unveiled a new rectangular dish that interested customers can buy to tap into the company's growing satellite constellation in low Earth orbit. It's a thinner and lighter weight option than the circular dish that Starlink beta users have been testing over the last year.

Starlink is SpaceX's satellite internet project, which aims to launch nearly 12,000 satellites into low Earth orbit where they can provide broadband internet coverage to people on the ground — notably those in remote and rural areas where traditional internet infrastructure is lacking. With so many satellites in low orbit at once, the idea is to have at least one satellite in view over every patch of the Earth, providing near continuous internet coverage to users. In order to tap into the system, users need to mount a dish somewhere near their home, like the roof, where they can get a clear view of the sky (free of trees) at all times.

SpaceX launched the beta version of Starlink in October 2020, allowing users in certain geographical areas of the US to purchase the company's starter kit, which included a 23-inch-wide circular user terminal — or dish — mounting equipment, a Wi-Fi router, and all the cables one would need. The buy-in cost was $499 for the kit and then $99 a month for coverage. Now, users have the option to buy this new rectangular dish instead, which is just 12 inches wide and 19 inches long. At 9.2 pounds, it's nearly half the weight of the original 16-pound dish. However, the price to buy the rectangular option appears unchanged.

Starlink won't solve internet

> Howard, A. (2021, October 2). *Starlink is not the lone solution to the digital divide*. Allconnect. Retrieved January 30, 2022, from https://www.allconnect.com/blog/elon-musks-starlink-is-not-the-lone-solution-to-the-digital-divide

Pricing is a roadblock

As of 2020, Microsoft reported there are over 157 million Americans who lack access to high-speed internet (internet speeds of at least 25/3 (download/upload) Mbps). Since access to broadband speeds is such a major issue in the U.S., many believe that Starlink could be the ideal solution for those who lack any fixed broadband options in their area.

The major issue, however, is that the average American living in a rural area simply cannot afford the cost of Starlink. Although pricing may change, Starlink currently charges $99/mo. for its service and a one-time fee of $499 to cover equipment and installation.

According to the Economic Research Service, the average rural American made $42,993 in 2019. For many, paying a $99/mo. service fee and a $499 equipment fee, therefore, may just not be realistic. The average American is currently paying around $64/mo. for internet service and that's already too high for many.

In fact, the number one reason why millions of Americans lack internet access is not because they lack access to broadband service but because they cannot afford the cost of internet.

Starlink generates aluminum oxide - that causes a new hole in the ozone

Delbert 21, Caroline Delbert is a writer, book editor, researcher, and avid reader. "All the Satellites in Space Could Crack Open the Ozone Layer", https://www.popularmechanics.com/space/satellites/a36651845/satellite-pollution-starlink-ozone/, JUN 17, 2021, accessed 12/1/21,

The hole in the ozone layer, Earth's protective chemical shield that absorbs most of the sun's ultraviolet rays, has slowly healed over the last few decades since the global ban of chlorofluorocarbons (CFCs). But scientists are now raising the alarm about puncturing a new hole in the ozone layer—this time without any noticeable CGCs in sight. Instead, the surprising cause is deterioration of the aluminum in megaconstellation satellites like SpaceX's Starlink network. For our purposes, a satellite is a human-made object put into low-Earth orbit (LEO) for a planned lifespan. There are about 5,000 active and defunct satellite sin LEO, with over 40,000 Starlink sats planned in the future, plus satellite projects from national space agencies and private companies around the world, researchers from the University of British Columbia say in their new Scientific Reports study. The human-made distinction may seem obvious, but it hasn't always been. That's because, as Space.com reports, scientists spent decades favorably comparing satellite "junk" to the amount of material deposited and burned up in our atmosphere by meteorites. As long as meteorites were so much more of the material by volume while doing almost no harm to the planet, how bad could human-made satellites be? Well, as it turns out, it's a matter of quality rather than quantity. That's because meteorites are made of a different constellation of minerals and elements than our custom-manufactured sky robots. "We have 54 tonnes (60 tons) of meteoroid material coming in every day," lead study author Aaron Boley told Space.com. "With the first generation of Starlink, we can expect about 2 tonnes (2.2 tons) of dead satellites reentering Earth's

atmosphere daily. But meteoroids are mostly rock, which is made of oxygen, magnesium and silicon. These satellites are mostly aluminum, which the meteoroids contain only in a very small amount, about 1 [percent].” Aluminum is key to everything at stake here. First, it burns into reflective aluminum oxide, or alumina, which could turn into an unwitting geoengineering experiment that could alter Earth’s climate. And second, aluminum oxide could damage and even rip a new hole in the ozone layer. Let’s look at each threat separately and try to figure it out. Misadventures in Geoengineering Geoengineering is the umbrella term for technologies that seek to alter the climate or other physical realities about the planet. The major meaning that most people associate with the word is solar geoengineering, an experimental idea to fight climate change. Yes, this includes launching reflective aerosols that will “block the sun” back into space and ostensibly cool the planet, which is what Bill Gates eventually wants to try. But we just don’t know how large-scale geoengineering could affect the planet’s climate. (In the sci-fi flick Snowpiercer, geoengineering has turned Earth into a lifeless iceball whose only survivors must crowd aboard an unceasing train. That’s probably our worst-case scenario.) Aluminum oxide scatters more light than glass, with a refractive index of about 1.76 compared with just 1.52 for glass and about 1.37 for plain aluminum. The researchers write: “Anthropogenic deposition of aluminum in the atmosphere has long been proposed in the context of geoengineering as a way to alter Earth’s albedo. These proposals have been scientifically controversial and controlled experiments encountered substantial opposition. Mega-constellations [of satellites] will begin this process as an uncontrolled experiment.” Another Hole in the Ozone? What, then, of the ozone layer? Once again, aluminum oxide comes to the forefront. As aluminum burns, it can chemically react with ozone in the air to form aluminum oxide, thereby depleting the naturally protective supply of ozone in the atmosphere. The atmosphere can absorb a small amount of these chemicals without ill effect, but with tens of thousands of satellites in play, the quantities will naturally go up. That’s in addition to the ozone damage done by each rocket launch to put satellites into LEO. “Rockets threaten the ozone layer by depositing radicals directly into the stratosphere, with solid-fueled rockets causing the most damage because of the hydrogen chloride and alumina they contain,” the researchers write. While satellites typically dissolve above the stratosphere where most ozone is contained, the particulate can drift down into the stratosphere in order to react there with ozone, scientist Gerhard Drolshagen, an expert on meteoroid material, told Space.com. Aluminum oxide will sink to that level and subsequently cause losses.

Ozone depletion causes extinction

Southampton University ‘20 [University of Southampton; a public research university; 05-27-2020; “Erosion of ozone layer responsible for mass extinction event”; ScienceDaily; https://www.sciencedaily.com/releases/2020/05/200527150158.htm; Accessed 12-03-2021] AK

Now, scientists have found evidence showing it was high levels of UV radiation which collapsed forest ecosystems and killed off many species of fish and tetrapods (our four limbed ancestors) at the end of the Devonian geological period, 359 million years ago. This damaging burst of UV radiation occurred as part of one of the Earth's climate cycles, rather than being caused by a huge volcanic eruption.

The ozone collapse occurred as the climate rapidly warmed following an intense ice age and the researchers suggest that the Earth today could reach comparable temperatures, possibly triggering a similar event. Their findings are published in the journal Science Advances.

The team collected rock samples during expeditions to mountainous polar-regions in East Greenland, which once formed a huge ancient lake bed in the arid interior of the Old Red Sandstone Continent, made up of Europe and North America. This lake was situated in the Earth's southern hemisphere and would have been similar in nature to modern day Lake Chad on the edge of the Sahara Desert.

Other rocks were collected from the Andean Mountains above Lake Titicaca in Bolivia. These South American samples were from the southern continent of Gondwana, which was closer to the Devonian South Pole. They held clues as to what was happening at the edge of the melting Devonian ice sheet, allowing a comparison between the extinction event close to the pole and close to the equator.

Back in the lab, the rocks were dissolved in hydrofluoric acid, releasing microscopic plant spores (like pollen, but from fern like plants that didn't have seeds or flowers) which had lain preserved for hundreds of millions of years. On microscopic examination, the scientists found many of the spores had bizarrely formed spines on their surface -- a response to UV radiation damaging their DNA. Also, many spores had dark pigmented walls, thought to be a kind of protective 'tan', due to increased and damaging UV levels.

The scientists concluded that, during a time of rapid global warming, the ozone layer collapsed for a short period, exposing life on Earth to harmful levels of UV radiation and triggering a mass extinction event on land and in shallow water at the Devonian-Carboniferous boundary.

Advantage: Debris

Starlink is responsible for HALF of all dangerous space near-collisions – full megaconstellations make collisions ten times more likely and debris avoidance software doesn’t check.

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Space News and served as a maternity cover science editor at the European Space Agency. “SpaceX Starlink satellites responsible for over half of close encounters in orbit, scientist says”, August 18, 2021, https://www.space.com/spacex-starlink-satellite-collision-alerts-on-the-rise, accessed 12/1/21,

Operators of satellite constellations are constantly forced to move their satellites because of encounters with other spacecraft and pieces of space junk. And, thanks to SpaceX's Starlink satellites, the number of such dangerous approaches will continue to grow, according to estimates based on available data. SpaceX's Starlink satellites alone are involved in about 1,600 close encounters between two spacecraft every week, that's about 50 % of all such incidents, according to Hugh Lewis, the head of the Astronautics Research Group at the University of Southampton, U.K. These encounters include situations when two spacecraft pass within a distance of 0.6 miles (1 kilometer) from each other. Lewis, Europe's leading expert on space debris, makes regular estimates of the situation in orbit based on data from the Socrates (Satellite Orbital Conjunction Reports Assessing Threatening Encounters in Space) database. This tool, managed by Celestrack, provides information about satellite orbits and models their trajectories into the future to assess collision risk. Lewis publishes regular updates on Twitter and has seen a worrying trend in the data that reflects the fast deployment of the Starlink constellation. "I have looked at the data going back to May 2019 when Starlink was first launched to understand the burden of these megaconstellations," Lewis told Space.com. "Since then, the number of encounters picked up by the Socrates database has more than doubled and now we are in a situation where Starlink accounts for half of all encounters." The current 1,600 close passes include those between two Starlink satellites. Excluding these encounters, Starlink satellites approach other operators’ spacecraft 500 times every week. In comparison, Starlink's competitor OneWeb, currently flying over 250 satellites, is involved in 80 close passes with other operators' satellites every week, according to Lewis' data. And the situation is bound to get worse. Only 1,700 satellites of an expected constellation of tens of thousands have been placed into orbit so far. Once SpaceX launches all 12,000 satellites of its first generation constellation, Starlink satellites will be involved in 90% of all close approaches, Lewis’ calculations suggest. The risk of collision Siemak Hesar, CEO and co-founder of Boulder, Colorado, based Kayhan Space, confirms the trend. His company, which develops a commercial autonomous space traffic management system, estimates that on average, an operator managing about 50 satellites will receive up to 300 official conjunction alerts a week. These alerts include encounters with other satellites as well as pieces of debris. Out of these 300 alerts, up to ten might require operators to perform avoidance maneuvers, Hesar told Space.com. Kayhan Space bases their estimates on data provided by the U.S. Space Surveillance Network. This network of radars and telescopes, managed by the U.S. Space Force, closely monitors about 30,000 live and defunct satellites and pieces of debris down to the size of 4 inches (10 centimeters) and provides the most accurate location data of the orbiting objects. The size of this catalog is expected to increase ten times in the near future, Hesar added, partly due to the growth of megaconstellations, such as Starlink, and partly as sensors improve and enable detection of even smaller objects. The more objects in the catalog mean more dangerously close encounters. "This problem is really getting out of control," Hesar said. "The processes that are currently in place are very manual, not scalable, and there is not enough information sharing between parties that might be affected if a collision happens." Hesar compared the problem to driving on a highway and not knowing that there has been an accident a few miles ahead of you. If two spacecraft collide in orbit, the cloud of debris the crash generates would threaten other satellites travelling through the same area. "You want to have that situational awareness for the other actors that are flying in the neighbourhood," Hesar said. Bad decisions

Despite the concerns, only three confirmed orbital collisions have happened so far. Earlier this week, astrophysicist and satellite tracker Jonathan McDowell, who's based at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, found evidence in Space-Track data that the Chinese meteorological satellite Yunhai 1-02, which disintegrated in March this year, was actually hit by a piece of space debris. The worst known space collision in history took place in February 2009 when the U.S. telecommunication satellite Iridium 33 and Russia's defunct military satellite Kosmos-2251 crashed at the altitude of 490 miles (789 kilometres). The incident spawned over 1,000 pieces of debris larger than 4 inches (10 cm). Many of these fragments were then involved in further orbital incidents. Lewis is concerned that with the number of close passes growing, the risk of operators at some point making a wrong decision will grow as well. Avoidance maneuvers cost fuel, time and effort. Operators, therefore, always carefully evaluate such risks. A decision not to make an avoidance maneuver following an alert, such as that made by Iridium

in 2009, could, however, clutter the orbital environment for years and decades. "In a situation when you are receiving alerts on a daily basis, you can't maneuver for everything," Lewis said. "The maneuvers use propellant, the satellite cannot provide service. So there must be some threshold. But that means you are accepting a certain amount of risk. The problem is that at some point, you are likely to make a wrong decision." Hesar said that uncertainties in the positions of satellites and pieces of debris are still considerable. In case of operational satellites, the error could be up to 330 feet (100 meters) large. When it comes to a piece of debris, the uncertainty about its exact position might be in the order of a mile or more. "This object can be anywhere in this bubble of multiple kilometres," Hesar said. "At this point, and for the foreseeable future, avoidance is our best recourse. People that say 'I'm going to take the risk', in my humble opinion, that's an irresponsible thing to do." Starlink monopoly Lewis is concerned about the growing influence of a single actor — Starlink — on the safety of orbital operations. Especially, he says, as the spaceflight company has entered the satellite operations world only recently. "We place trust in a single company, to do the right thing," Lewis said. "We are in a situation where most of the maneuvers we see will involve Starlink. They were a launch provider before, now they are the world's biggest satellite operator, but they have only been doing that for two years so there is a certain amount of inexperience." SpaceX relies on an autonomous collision avoidance system to keep its fleet away from other spacecraft. That, however, could sometimes introduce further problems. The automatic orbital adjustments change the forecasted trajectory and therefore make collision predictions more complicated, according to Lewis. "Starlink doesn't publicize all the maneuvers that they're making, but it is believed that they are making a lot of small corrections and adjustments all the time," Lewis said. "But that causes problems for everybody else because no one knows where the satellite is going to be and what it is going to do in the next few days."

LEO collisions eliminate military sats

Wong 19 "Congested Outer Space: Increased Deployment of Small Satellite Constellations Could Hamper Military Space Operations" 2019 Arthur Wong [Strategic Development of Forces Division, SHAPE. Prior to working at SHAPE he has worked at NATO HQ, within the Defence Investment Division on interoperability for NATO's multinational battlegroups.] https://www.japcc.org/congested-outer-space/ SM

Space Debris Threat Increases in the LEO

The usage of cube satellite has provided positive impacts in various fields, ranging from environmental studies to offering worldwide internet access in rural areas through communication constellations. However, the current space environment is becoming congested. Hundreds of satellites have already been scheduled to launch each year before the construction of the constellation programme by OneWeb, SpaceX and Amazon. To further worsen the space debris situation in the LEO, direct-ascent Anti-Satellite Testing (ASAT) was conducted in recent years and more debris will be created through such testing. During the Chinese ASAT in 2007, some debris from the collision was blasted outward away from the Earth, causing a potential threat to satellites above the altitude where the ASAT testing occurred.14 Nine years after the incident happened, there are still more than 3,000 traceable pieces in orbit.

In 2009, two satellites collided at a speed of 10 km/s at an altitude of 800 km. This was the first time a collision had happened between two satellites. The incident created more than 1,000 pieces of debris larger than 10 cm. Such activity could initiate a chain reaction, creating more collisions from the initial impact. This phenomenon is known as the Kessler Syndrome.15

From early 2019, there were approximately 34,000 pieces of debris larger than 10 cm (similar to the size of a cube satellite) and more than 900,000 pieces of debris ranging from one cm to 10 cm in size. Objects that are smaller than one cm in size are expected to be more than 100 million within the LEO.16 Despite the small size of the space debris, they are travelling at a speed of more than seven km/s. At this speed, tiny objects could harm any large satellite orbiting in the LEO. While satellites can increase their physical hardening to protect the on-board instruments from impact, some satellites cannot be hardened due to the size and dimensional constraints. Furthermore, hardened materials would also increase the overall cost of the satellite.

Constellation in the Making Could Impact Space-Based Military Assets

The previous examples revealed the congestion of the LEO. With companies continuing to launch thousands of small satellites, the chances of a collision in space will continue to increase. This will hinder space-based Intelligence, Surveillance and Reconnaissance (ISR) support to provide valuable information to military operations. A majority of the ISR assets are orbiting in the LEO. NATO relies on space-based assets to assist its operations. Increasing the number of spacecraft in the LEO could raise problems and threats to military assets as well as access to space assets to support operations. If the orbital path of these smaller objects were not tracked by the Space Operation Centre regularly, larger satellites or manned-space stations could be penetrated by the non-propulsion satellites, making them a potential kinetic kill vehicle.

Most satellites within the 600 km region of the LEO are affected by the atmospheric drag, which is helping to bring down some of the obsolete satellites. However, satellites orbiting above 800 km are less likely to be affected by the atmospheric drag, making cube satellites or small satellites without propulsion systems difficult to deorbit once they have reached the EOL.17, 18 The altitude for some of the OneWeb, Starlink and Kuiper constellations is planned to be above the atmospheric drag region. Despite this, Starlink satellites will have propulsion system for orbital manoeuvre and EOL deorbiting, tracking the full constellation with 12,000 satellites could be challenging for the company and the Combined Space Operations Center (CSpOC).19 Additionally, there is the possibility of losing contact with satellites before they reach their EOL. Envisat, an 8,210 kg satellite that is currently drifting at an altitude of 785 km, poses a collision threat with other satellites. Envisat was expected to decommission in 2014 but the European Space Agency (ESA) lost contact with the satellite in 2012.20 If no interaction will be made with the Envisat, it is expected to stay in orbit for the next 150 years.21

Debris causes war - international military crises, lack of services, lack of liability

Breen 18 (Nicole, Lieutenant, United States Navy, Master of Science in Space Systems Operations, Marshall Kaplan, an orbital debris expert within the Space Department at the John Hopkins Applied Physics Laboratory, Vitaly Adushkin, from the Russian Academy of Sciences, "CAN THE OUTER SPACE TREATY PREVENT CONFLICTS IN ORBIT IN THE 21ST CENTURY?", https://apps.dtic.mil/dtic/tr/fulltext/u2/1059769.pdf, June 2018, Ak.)

According to scientists, quoted by Ian Sample, Science Editor for the Guardian news, "the steady rise in space junk that is floating around the planet could provoke a political row and even armed conflict." 419 During the Space Foundation's 27th National Symposium in 2011, Commander of U.S. Air Force Command at the time, General William Shelton, said it best when he said "the traffic is increasing. We've now got over 50 nations that are participants in the space environment." 420Additionally, the space environment is no longer just nation states or government agencies, the commercial and private sectors have entered into the domain adding a new area of concern if space debris are not addressed on a more serious arena.421 This section will consider the potential conflicts that could occur regarding space debris separated by those that are most likely or most dangerous. Additionally, hypothetical scenarios will be discussed to emphasize the reality of future conflict regarding space debris. 1. Most Likely Marshall Kaplan, an orbital debris expert within the Space

Department at the John Hopkins Applied Physics Laboratory, states "the buildup of debris is not a naturally reversible process. If we are to clean up space, it will certainly be complex and very expensive." 422 The major question is who is going to pay for it? As mentioned above, there are over 50 nations in space423; is it realistic to think that each space-faring nation will contribute to the clean-up in space? Or will one or two countries take on much of the cost? Even Kaplan suggests that "it is unlikely space-faring nations are going to do anything significant about cleaning up space; as any cleanup would be too expensive." 424 Additionally, Kaplan addresses the lack of technology available to economically cleanup space, and with increased technology comes added costs.425 And, if the capability exists to remove space objects from outer space, this could then potentially become a more dangerous concern. What if that technology could also be used as a space weapon to pluck adversary satellites from the sky? That could potentially cause conflicts that would reach both political and military arenas. Furthermore, space debris increase the risk of collisions occurring in outer space, which, in turn, raise costs of operating satellites.426 Operators have to consider in the design phase "greater expenditures of fuel and interruptions of missions from space debris avoidance maneuvers." 427 These rising costs could potentially "make it financially unviable to perform certain types of space missions in the future, leading to loss of social benefits." 428 The goal is to preserve space for all to use safely without worry from space debris, but these questions and concerns proposed suggest that cost is one of the most likely international disputes or disagreements that will be faced in the future. If not addressed, it could lead to more alarming conflicts. Let us imagine a hypothetical scenario: A proposed international agreement suggests creating an international agency that is solely dedicated to developing space debris mitigation technology. This agency is different than IADC, as it is specifically dedicated to the research and development of technology, only to be used for space debris mitigation and clean-up. In this proposed agreement, it suggests that representatives from each spacefaring nations and additional countries that have signed the OST be sent to this agency and that the budget for these developing technologies and inventions be split among the spacefaring nations governments. What happens if Russia or the United States decide not to contribute? Will one country carry the burden of all the costs? What if a space-faring nation do not have the means to afford it? Do they not get to participate in space? These scenarios could occur in the future if space debris is not addressed on an international level. An additional likely conflict deals with the issue of liability and attribution; what is the solution to damage caused by space debris that is unattributable "to a certain space object and thereby to a certain nation state?" 429 Although Articles VI and VII of the OST could provide guidelines for a collision that can be attributed, realistically, they are too generic to address all the various scenarios that could occur regarding space debris.430 Let us imagine two hypothetical scenarios. First, a U.S. satellite is struck by space debris that can be attributed to the 2007 Chinese ASAT test, causing severe damage; and, second, an essential U.S. military satellite is struck by unattributed space debris, causing severe damage as well as disrupting U.S. military operations. These two scenarios could very well happen. The first scenario has the likelihood to cause political instability, which could lead to a military confrontation. If it were a commercial U.S. Satellite, then the U.S. could demand compensation for damages through the Liability Convention. But what if the Chinese refuse to admit guilt or refuse to pay? That is going to cause some political tensions between the United States and China. Now, if the satellite hit were a strategic U.S. military satellite, then this could cause a little more strife within the military community. This scenario would not likely lead to war, but it does have the potential to create tension between the U.S. military and the Chinese government. The second scenario causes even more concern because the collision cannot be attributed and, therefore, the U.S. military must operate without a certain capability and must bear the costs to fix it. Military service operators could be in danger for a period of time, while that satellite is non-operational. Additionally, it does not have to be a U.S. satellite, what if the International Space Station were struck? Commercial companies are also promoting space tourism as well. The potential for innocent lives to be lost raises the level of conflict to a higher level, especially if that debris can be attributed to another country. The scenarios and concerns presented above suggest that liability and attribution are two of the more likely issues that could create political instabilities or even military disputes. 2. Most Dangerous One of the more dangerous concerns is the idea that the world will reach "a point of no return in space" 431 meaning there will be so much space junk that the ability to operate ceases to exist.432 In Marshall Kaplan's view, "space-faring nations have already passed the point of no return, with the accumulation of debris objects in LEO steadily building over the past 50 years." 433 As discussed earlier, NASA's Kessler, established a similar concept called the Kessler Syndrome, which stated "when debris reaches a critical

density in particular orbit, it can set off a chain reaction of collisions that create more debris, eventually making the orbit unusable." 434 The importance of this statement is with the word "eventually," because Kessler understood that this process could take decades.435 But, he wanted the world, especially the U.S., "to understand that if we don't actively start removing five to ten objects per year for the next 100 years, we'll have an unstable environment." 436 Unstable environments have the potential to lead to political and military crisis. For example, imagine a hypothetical future scenario where LEO has been banned for satellite usage due to the immense amount of traffic, which no longer allows satellites to orbit safely without being hit by debris. Also, the satellites left in LEO are colliding with one another, creating even more debris and, additionally, making it difficult to launch satellites into higher orbits. This becomes a global conflict; militaries lose capabilities, and civilians lose basic luxuries that commercial space offers such as Internet connectivity, satellite television broadcasts, and other communications. The scenario presented above could result in an international crisis, creating the potential for more dangerous political and military disputes and disagreements. If space were unusable, the world might then become unstable, since we now depend on a variety of data from space for society, national militaries, and the international economy to function. The loss of satellites, specifically military assets, to space debris could incite armed conflict between space-faring nations.437 Armed conflict or even war in space would be the most dangerous possibility resulting from space debris collisions. Vitaly Adushkin, from the Russian Academy of Sciences, says that there can only be two likelihoods when a military defense satellite suddenly fails: "an unregistered collision with space debris or an aggressive action by an adversary." 438 Both of those possibilities deal with a sensitivity that has the potential to become a politically or militarily dangerous conflict.439 F. CONCLUSION The amount of space debris is increasing apace; as it continues to increase, so does the risk of collisions to both government and commercial space assets.

War causes extinction, even without nukes

Dvorsky '12 (George Dvorsky; George P. Dvorsky (born May 11, 1970) is a Canadian bioethicist, transhumanist and futurist. He is producer of the Sentient Developments blog and podcast. He was Chair of the Board for the Institute for Ethics and Emerging Technologies (IEET)[2][3] and is the founder and chair of the IEET's Rights of Non-Human Persons Program,[4] a group that is working to secure human-equivalent rights and protections for highly sapient animals. He also serves on the Advisory Council of METI (Messaging Extraterrestrial Intelligence); 12-12-2012; "9 Ways Humanity Could Bring About Its Own Destruction"; https://io9.gizmodo.com/9-ways-humanity-could-bring-about-its-own-destruction-5967660, io9, accesseed 12-3-2019; JPark)

World War III At the close of the Second World War, nearly 2.5% of the human population had perished. Of the 70 million people who were killed, about 20 million died from starvation. And disturbingly, civilians accounted for nearly 50 percent of all deaths — a stark indication that war isn't just for soldiers any more. Given the incredible degree to which technology has advanced in the nearly seven decades since this war, it's reasonable to assume that the next global 'conventional war' — i.e. one fought without nuclear weapons — would be near apocalyptic in scope. The degree of human suffering that could be unleashed would easily surpass anything that came before it, with combatants using many of the technologies already described in this list, including autonomous killing machines and weaponized nanotechnology. And in various acts of desperation (or sheer malevolence), some belligerent nations could choose to unleash chemical and biological agents that

would result in countless deaths. And like WWII, food could be used as a weapon; agricultural yields could be brought to a grinding halt. Thankfully, we're a far ways off from this possibly. Though not guaranteed, the global conflicts of the 20th century may have been an historical anomaly — one now greatly mitigated by the presence of nuclear arms.

Solvency

Thus the plan: Resolved: The appropriation of outer space by private entities in Low Earth Orbit is unjust

UV

I get 1ar theory or else the 1nc can be infinitely abusive which outweighs on magnitude