|  |
| --- |
| **Mega Constellation AC (the case that got Charles 2nd at Harvard)** |

**I strongly affirm that the appropriation of outer space by private entities is unjust.**

**Framework**

The value is **justice** as implied by the resolution and

The value criterion is **minimizing suffering.**

Prefer this framework for 3 reasons:

**1. Minimizing suffering is a prerequisite to other frameworks.**

**You can’t evaluate philosophy if you're dead or suffering, we must minimize suffering before we consider other framings.**

**2. All questions of value depend upon consequences.**

**Harris 10**

Sam Harris (CEO Project Reason; PHD UCLA Neuroscience; BA Stanford Philosophy). “The Moral Landscape: How Science Can Determine Human Values.” 2010.

Here is my (consequentialist) starting point: **all questions of value** (right and wrong, good and evil, etc.) **depend[s] upon the possibility of experiencing [it] such value. Without potential consequences at the level of experience**—happiness, suffering, joy, despair, etc.—**all talk of value is empty.** Therefore, to say that an act is morally necessary, or evil, or blameless, is to make (tacit) claims about its consequences in the lives of conscious creatures (whether actual or potential). I am unaware of any interesting exception to this rule. Needless to say, [For example,] if one is worried about pleasing God or His angels, this assumes that such invisible entities are conscious (in some sense) and cognizant of human behavior. It also generally assumes [and] that it is possible to suffer their [his] wrath or enjoy their approval, either in this world or the world to come. Even within religion, therefore, consequences and conscious states remain the foundation of all value

**3. Moral Uncertainty means any risk of extinction always outweighs**

**Bostrom 13**

Nick. "Existential risk prevention as global priority." Global Policy 4.1 (2013): 15-31. (Faculty of Philosophy and Oxford Martin School University of Oxford)// Elmer recut by SHS/JS

These reflections on moral uncertainty suggest an alternative, complementary way of looking at existential risk; they also suggest a new way of thinking about the ideal of sustainability. Let me elaborate. Our present understanding of axiology might well be confused. **We may not now know — at least not in concrete detail — what outcomes would count as a big win for humanity**; we might not even yet be able to imagine the best ends of our journey. If we are indeed profoundly uncertain about our ultimate aims, then we should recognize that there is a great option value in preserving — and ideally improving — our ability to recognize value and to steer the future accordingly. **Ensuring that there will be a future version of humanity** with great powers and a propensity to use them wisely **is plausibly the best way available to us to increase the probability that the future will contain a lot of value. To do this, we must prevent any existential catastrophe**.

**Contention 1 - Mega Constellations (☺)**

**Currently companies are building mega constellations which are large groups of satellites that perform different functions. Some examples include Starlink by SpaceX and Kuiper by Blue Origin. Unfortunately there are two major consequences of this private appropriation.**

**Subpoint A - Collisions**

**Mega constellations lead to debris- debris is manageable now, but becomes a problem due to huge increases in satellites.**

**Boley & Byers 21 notes**

[Aaron C., Department of Physics and Astronomy @ The University of British Columbia\*, and Michael, Department of Political Science @ The University of British Columbia; Published: 20 May 2021; Scientific Reports; “Satellite mega-constellations create risks in Low Earth Orbit, the atmosphere and on Earth,”<https://www.nature.com/articles/s41598-021-89909-7>] brett

**Companies** **are** placing satellites into orbit at an unprecedented frequency to **build[ing] ‘mega-constellations’ of** communications **satellites** in Low Earth Orbit (LEO). In two years, **the number** of active and defunct satellites **in [low earth orbit]** LEO **has increased by** over **50%, to** about **5000** (as of 30 March 2021). **SpaceX alone is on track** **to** **add 11,000** more as it builds its Starlink mega-constellation **and** has already **filed for** permission for **another 30,000** satellites with the Federal Communications Commission (FCC)1. Others have similar plans, including OneWeb, Amazon, Telesat, and GW, which is a Chinese state-owned company2. The current governance system for LEO, while slowly changing, is ill-equipped to handle large satellite systems. Here, we outline how applying the consumer electronic model to satellites could lead to multiple tragedies of the commons. Some of these are well known, such as impediments to astronomy and an **increased risk of space debris**, while others have received insufficient attention, including changes to the chemistry of Earth’s upper atmosphere and increased dangers on Earth’s surface from re-entered debris. The heavy use of certain orbital regions might also result in a de facto exclusion of other actors from them, violating the 1967 Outer Space Treaty. All of these challenges could be addressed in a coordinated manner through multilateral law-making, whether in the United Nations, the Inter-Agency Debris Committee (IADC), or an ad hoc process, rather than in an uncoordinated manner through different national laws. Regardless of the law-making forum, mega-constellations require a shift in perspectives and policies: from looking at single satellites, to evaluating systems of thousands of satellites, and doing so within an understanding of the limitations of Earth’s environment, including its orbits. **Thousands** **of satellites** and 1500 rocket bodies **provide considerable mass** in LEO, **which** can **break** into debris **upon collisions**, explosions, or degradation in the harsh space environment. **Fragmentations increase** the cross-section of orbiting material, and with it, the **collision probability per time**. Eventually, collisions could dominate on-orbit evolution, a situation called the Kessler Syndrome3. There are already over 12,000 trackable debris pieces in LEO, with these being typically 10 cm in diameter or larger. Including sizes down to 1 cm, there are about a million inferred debris pieces, all of which threaten satellites, spacecraft and astronauts due to their orbits crisscrossing at high relative speeds. Simulations of the long-term evolution of **debris** suggest that LEO is already in the protracted initial stages of the Kessler Syndrome, but that this **could be managed** through active debris removal4. **[However] The addition of** satellite **mega-constellations** and the general proliferation of low-cost satellites **in [orbit]** LEO **stresses the environment further**5,6,7,8. Results The overall setting The rapid development of the space environment through mega-constellations, predominately by the ongoing construction of Starlink, is shown by the cumulative payload distribution function (Fig. 1). From an environmental perspective, the slope change in the distribution function defines NewSpace, an era of dominance by commercial actors. Before 2015, changes in the total on-orbit objects came principally from fragmentations, with effects of the 2007 Chinese anti-satellite test and the 2009 Kosmos-2251/Iridium-33 collisions being evident on the graph. Figure 1 [Figure 1 omitted]      Cumulative on-orbit distribution functions (all orbits). Deorbited objects are not included. The 2007 and 2009 spikes are a Chinese anti-satellite test and the Iridium 33-Kosmos 2251 collision, respectively. The recent, rapid rise of the orange curve represents NewSpace (see "Methods"). Full size image Although the volume of space is large, individual satellites and satellite systems have specific functions, with associated altitudes and inclinations (Fig. 2). This increases congestion and requires active management for station keeping and collision avoidance9, with automatic collision-avoidance technology still under development. Improved space situational awareness is required, with data from operators as well as ground- and space-based sensors being widely and freely shared10. Improved communications between satellite operators are also necessary: in 2019, the European Space Agency moved an Earth observation satellite to avoid colliding with a Starlink satellite, after failing to reach SpaceX by e-mail. Internationally adopted ‘right of way’ rules are needed10 to prevent games of ‘chicken’, as companies seek to preserve thruster fuel and avoid service interruptions. SpaceX and NASA recently announced11 a cooperative agreement to help reduce the risk of collisions, but this is only one operator and one agency. Figure 2 [Figure 2 omitted] Orbital distribution and density information for objects in Low Earth Orbit (LEO). (Left) Distribution of payloads (active and defunct satellites), binned to the nearest 1 km in altitude and 1° in orbital inclination. The centre of each circle represents the position on the diagram, and the size of the circle is proportional to the number of satellites within the given parameter space. (Right) Number density of different space resident objects (SROs) based on 1 km radial bins, averaged over the entire sky. Because SRO objects are on elliptical orbits, the contribution of a given object to an orbital shell is weighted by the time that object spends in the shell. Despite significant parameter space, satellites are clustered in their orbits due to mission requirements. The emerging Starlink cluster at 550 km and 55° inclination is already evident in both plots (Left and Right). Full size image When completed, Starlink will include about as many satellites as there are trackable debris pieces today, while its total mass will equal all the mass currently in LEO—over 3000 tonnes. The satellites will be placed in narrow orbital shells, creating unprecedented congestion, with 1258 already in orbit (as of 30 March 2021). OneWeb has already placed an initial 146 satellites, and Amazon, Telesat, GW and **other companies**, operating under different national regulatory regimes, **are soon** likely **to follow**. Enhanced collision risk **Mega-constellations are** composed of **mass-produced** satellites **with few backup systems**. **This** consumer electronic model **allows for** short upgrade cycles and rapid expansions of capabilities, but also **considerable discarded equipment**. SpaceX will actively de-orbit its satellites at the end of their 5–6-year operational lives. However, this process takes 6 months, so roughly 10% will be de-orbiting at any time. If other companies do likewise, thousands of de-orbiting satellites will be slowly passing through the same congested space, **posing collision risks**. Failures will increase these numbers, although the long-term failure rate is difficult to project. Figure 3 is similar to the righthand portion of Fig. 2 but includes the Starlink and OneWeb mega-constellations as filed (and amended) with the FCC (see “Methods”). The large density spikes show that some shells will have satellite number densities in excess of n=10−6 km−3. Figure 3 [Figure 3 omitted] Satellite density distribution in LEO with the Starlink and OneWeb mega-constellations as filed (and amended) with the FCC. Provided that the orbits are nearly circular, the number densities in those shells will exceed 10–6 km−3. Because the collisional cross-section in those shells is also high, they represent regions that have a high collision risk whenever debris is too small to be tracked or collision avoidance manoeuvres are impossible for other reasons. Full size image Deorbiting satellites will be tracked and operational satellites can manoeuvre to avoid close conjunctions. However, this depends on ongoing communication and cooperation between operators, which at present is ad hoc and voluntary. A recent letter12 to the FCC from SpaceX suggests that some companies might be less-than-fully transparent about events13 in LEO. Despite the congestion and traffic management challenges, FCC filings by SpaceX suggest that collision avoidance manoeuvres can in fact maintain collision-free operations in orbital shells and that the probability of a collision between a non-responsive satellite and tracked debris is negligible. However, the filings do not account for untracked debris6, including untracked debris decaying through the shells used by Starlink. Using simple estimates (see “Methods”), the probability that a single piece of untracked debris will hit any satellite in the Starlink 550 km shell is about 0.003 after one year. Thus, if at any time there are 230 pieces of untracked debris decaying through the 550 km orbital shell, there is a 50% chance that there will be one or more collisions between satellites in the shell and the debris. As discussed further in “Methods”, such a situation is plausible. Depending on the balance between the de-orbit and the collision rates, if subsequent fragmentation events lead to similar amounts of debris within that orbital shell, a runaway cascade of collisions could occur. Fragmentation events are not confined to their local orbits, either. The India 2019 ASAT test was conducted at an altitude below 300 km in an effort to minimize long-lived debris. Nevertheless, debris was placed on orbits with apogees in excess of 1000 km. As of 30 March 2021, three tracked debris pieces remain in orbit14. Such long-lived debris has high eccentricities, and thus can cross multiple orbital shells twice per orbit. A major fragmentation event from a single satellite could affect all operators in [orbit] LEO. Even if debris collisions were avoidable, meteoroids are always a threat. The cumulative meteoroid flux15 for masses m > 10–2 g is about 1.2 × 10–4 meteoroids m−2 year−1 (see “Methods”). Such masses could cause non-negligible damage to satellites16. Assuming a Starlink constellation of 12,000 satellites (i.e. the initial phase), there is about a 50% chance of 15 or more meteoroid impacts per year at m > 10–2 g. Satellites will have shielding, but events that might be rare to a single satellite could become common across the constellation. One partial response to these congestion and collision concerns is for operators to construct mega-constellations out of a smaller number of satellites. But this does not, individually or collectively, eliminate the need for an all-of-LEO approach to evaluating the effects of the construction and maintenance of any one constellation.

**Rival orbits for mega constellations create space conflict and prevent use of the orbit.**

**Samson 22**

Victoria Samson is the Washington office director for the Secure World Foundation, an organization that focuses on space sustainability, and she has over 20 years of experience in military space and security issues. Previously, Ms. Samson was a senior analyst for the Center for Defense Information. She also was a senior policy associate at the Coalition to Reduce Nuclear Dangers, a consortium of arms control groups. Earlier, she was a researcher at Riverside Research Institute, where she worked on war-gaming scenarios for the Missile Defense Agency. 1/17/22. [Bulletin of the Atomic Scientists, “The complicating role of the private sector in space,” DOI: 10.1080/00963402.2021.2014229] Justin

As of November 2021, there are roughly 4,800 active satellites in orbit around Earth, around 1,850 of which belong to just one entity: SpaceX’s Starlink mega-constellation (Thompson 2021). This change has happened very quickly, as Starlink satellites just began to be launched in May 2019 (O’Callaghan 2019). This is only the first wave of the megaconstellations as well. While it is hard to say exactly how many satellites will be launched as part of this new use of space, there are requests or plans for mega-constellations that could mean well over 100,000 new satellites could potentially be in low Earth orbit. While not all of these satellites will be launched, even a small fraction of that proposed number will fundamentally shift the situation so that the major actors in space will no longer be nation-states (as has been the case to date) but the private sector, changing the timbre of the space domain. This leads to challenges in discussing space security issues: Space is a shared, international domain; if we cannot include all the stakeholders in the discussions, we will not come to complete solutions to the problems. But first, some background. A little history The commercial sector is not new to space. Commercial entities have been active in space for decades now; in fact, it was a dispute over what should be the extent of their role in space that shaped part of the 1967 Outer Space Treaty. Article VI of that treaty notes: States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities . . .. The activities of nongovernmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. (Outer Space Treaty 1967) This was a compromise between the United States and the USSR, in which the latter argued that there was no such thing as commercial space. Having language requiring state actors to carry out “authorization and continuing supervision” gave the United States the flexibility it wanted to develop a commercial space sector while ensuring that there would still be national oversight. A lack of coordination One way in which the rise of these **mega-constellations** may complicate international security in space is through concerns about these satellites **hamper**ing **access to** certain **orbits**. While slots in geosynchronous Earth orbit are set by the International Telecommunication Union, **there is no** international **entity coordinating orbital slots** at low Earth orbit. This means that, given the potentially tens of thousands of satellites that could be launched given company plans, **certain orbits** could be **de facto ceded to** a handful of **entities** – in defiance of Article II of the Outer Space Treaty, which says that space “is not subject to national appropriation.” Consequently, this could lead to strife or competition over certain orbits. It is possible that, given the number of satellites that companies are asking the United States’ Federal Communications Commission for broadcasting rights to, certain orbits may reach their carrying capacities – meaning that they are at the maximum number of satellites that can be operated, as defined by physical and radiofrequency interference aspects. **This could lead to disputes over** which country has the **right to** use certain **orbits**, or, alternatively, resentment when one country’s commercial sector essentially takes over a particular orbit Competition over parts of the electromagnetic spectrum is another possible path for international security issues to arise from mega-constellations. Satellites are only as good as their ability to receive and communicate information, which requires spectrum; **if** one or a **few entities** from one country **use up all** the readily **accessible spectrum** for specific capabilities at certain orbits, **that could** possibly **lead to confrontation** as well. For the most part, the companies launching mega-constellations are largely based in the West, which can shape the global perception of their effects and intent – although there have been some plans for at least one Chinese company to launch a mega-constellation of potentially 13,000 satellites, and the South Koreans have expressed interest in their own mega-constellation.

**Space debris and the potential for collisions dooms future spaceflight.**

**Moltz 14**

[James Clay; chairman of the Department of National Security Affairs at the Naval Postgraduate School, where he also holds a joint faculty appointment in the Space Systems Academic Group., “Crowded orbits Conflict and Cooperation in Space,” Columbia University Press,<https://www.jstor.org/stable/10.7312/molt15912>] brett

As noted above, space tourism will become a much more robust industry by 2020 and especially in the decade after that, when such services might become accessible to those who fall below the top one percent of earners in the developed world. Indeed, much like air travel after World War II, it is foreseeable that suborbital flight will become affordable to tens of thousands of people in upper-income brackets by 2030, with a range of new services available as technology develops further. Hundreds may be able to visit orbital hotels or stations within ten years, and a growing number of people will be working in space, tending tourist facilities as well as various industrial and manufacturing enterprises. Another factor that might change the direction of current activities in Earth orbit is the expansion of national military programs in space. To date, only three countries carry out significant military activities beyond reconnaissance: the United States, Russia, and China. But this group will likely expand further in the coming two decades. The list of militaries that might decide they have a strategic interest in testing kinetic, laser, or other active space defenses includes India, Pakistan, Japan, Iran, Israel, France, Brazil, and North Korea. Additional types of weapons that might be developed and tested against space objects in the coming two decades by various militaries—assuming new arms control mechanisms are not developed—include microwave systems, particle beams, space mines, and Earth-, sea-, air-, and space-based electronic jammers. At present, no treaty forbids these technologies, and there are strong military-industrial lobbies in a number of countries supporting space-based weapons, despite their possibly disruptive effects on space commerce, science, and passive military operations in the same regions of space. In all likelihood, the growing population in the lower reaches of space will force some sort of decision regarding priorities: either to allow countries to test and deploy large-scale orbital defenses or to strictly limit destructive weapons and emphasize commercial development of low-Earth orbit, including expanded human spaceflight. Active defenses and **commerce** probably **will not be compatible in crowded orbits because of** the linkage between **space weapons** and **harmful debris,** particularly since such military tests and related onorbit deployments—once begun by one country for missile defense, ASAT, or space-to-ground attack options—are likely to be met with countermeasures by other militaries. Under such conditions, **the development of commercial** human **spaceflight in l**ow-**E**arth **o**rbit **will become too unsafe** to continue. **In this regard, successful space traffic management will be essential to the ability**

**AND, Private debris cleanup will fail due to government uncertainty.**

**Erwin 21**

[Sandra Erwin, 10-21-2021, "Analysis: Space Force endorsement not enough to incentivize debris removal industry", SpaceNews, https://spacenews.com/analysis-space-force-endorsement-not-enough-to-incentivize-debris-removal-industry/, date accessed 1-23-2022] //Lex AT

WASHINGTON — U.S. Space Force generals [made headlines](https://spacenews.com/u-s-space-force-would-support-commercial-services-to-remove-orbital-debris/) recently calling for the development of commercial services to clean up orbital debris. These statements convey a sense of urgency about the risk of collisions in space but the **government’s indecision** about how to manage this problem **is delaying private** investments and efforts to develop **space cleanup** businesses, says an industry analyst. In a [white paper](https://www.avascent.com/news-insights/avascent-apogee/building-the-business-case-for-space-debris-removal/) published Oct. 21 by the consulting firm Avascent, analyst Nick Bolger points to comments made last month by [Maj. Gen. DeAnna Burt](https://spacenews.com/space-force-backs-development-of-commercial-orbital-debris-removal-systems/), the vice commander of the Space Force’s Space Operations Command, who said “there is a use case for industry to go after” space debris removal as a business opportunity. From an industry perspective, however, **the business case is not quite so clear [for cleanup],** Bolger said. “Significant developments need to settle across industry in order to prove out this claim,” he said of Burt’s comments. With 16,000 satellites expected to be launched from 2021 to 2025, there is wide consensus that space sustainability and safe spaceflight operations are at risk. But actions to address the problem are being “challenged by shifting priorities of domestic and international governing agencies,” Bolger argues. “**Varying opinions of regulatory stakeholders on** how to approach **debris removal prevents** the U.S. **government** from taking **action** per se,” he said. **A major obstacle is uncertainty about what agencies** **should take** the **lead** in specific areas. A case in point is the transition of space traffic management responsibilities from the Defense Department to the Commerce Department which has for years been bogged down in studies and analysis. The Space Force says it wants to buy debris removal services, but if space traffic management moves to another agency it’s not clear who would make those buying decisions. “As far as a business case goes, I believe that **investors** may be **wary of backing** some of these nascent **companies without a guarantee** of future procurements **by the government**,” Bolger said. Another concern is the lack of standard metrics about collision hazards, he said. Agencies “self-regulate their space operations, often leveraging varying data sources and risk criteria to determine their need for collision avoidance maneuvers.” There’s been a number of close calls and near-miss collisions in recent years, and yet “governing bodies have shown little indication of taking the lead on deploying space debris removal and remediating technologies in the near future,” Bolger noted.

**The impact of Collisions is Miscalculation**

**Increasing debris triggers miscalculated war.**

**Dockrill 16 finds**

[Peter; 2016; Award-winning science & technology journalist. “Space Junk Accidents Could Trigger Armed Conflict, Study Finds.”<https://www.sciencealert.com/space-junk-accidents-could-trigger-armed-conflict-expert-warns>] brett

The increasingly crowded space in Earth's low orbit could set the stage for an international armed conflict, says a new study. Researchers from the Russian Academy of Sciences warn that **accidents** stemming **from** the steady rise in **space junk** floating around the planet could **incite** political rows and even **war**fare, with **nations** potentially **mistak**ing **debris**-caused incidents **as** the results of **intentional aggressive acts** by others. In a paper published in Acta Astronautica, the team suggests that space debris in the form of spent rocket parts and other fragments of hardware hurtling at high speed pose a "special political danger" that could dangerously escalate tensions between nations. According to the study, destructive impacts caused by random space junk cannot easily be told apart from military attacks. "The owner of the impacted and destroyed satellite can hardly quickly determine the real cause of the accident," the authors write. The **risks** of such an event occurring **are compounded by the** sheer **volume of debris** now orbiting Earth. Recent figures from NASA indicate that there are more than 500,000 pieces of space junk currently being tracked in orbit, travelling at speeds up to 28,160 km/h (17,500 mph). The majority of those objects are small – around the size of a marble – but some 20,000 of them are bigger than a softball. In addition to these 500,000 or so fragments – which are big enough for scientists to know about them – NASA estimates that there are millions of undetectable pieces of debris in orbit that are too small to be monitored. But even **extremely small fragments** such as these **pose** a threat – in fact, they're considered **a** **greater risk** than trackable debris, **as** their **[they’re] invisible** status means spacecraft and **satellites can't** do anything to **avoid them** until it's too late. As NASA observed in 2013: "Even tiny paint flecks can damage a spacecraft when travelling at these velocities. In fact a number of space shuttle windows have been replaced because of damage caused by material that was analysed and shown to be paint flecks… With so much orbital debris, there have been surprisingly few disastrous collisions." While we may have been lucky in the past, we can't rely on that to continue. The study by the Russian team cites the repeated sudden failures of defence satellites in past decades that were never explained. The researchers attribute two possible causes: either unrecorded collisions with space junk, or aggressive actions from adversaries. "This is a politically dangerous dilemma," the authors write.

**Modern War between space powers goes nuclear. Nuke war causes extinction – it won’t stay limited**

**Edwards 17**

[(Paul N. Edwards, CISAC’s William J. Perry Fellow in International Security at Stanford’s Freeman Spogli Institute for International Studies. Being interviewed by EarthSky/card is only parts of the interview directly from Paul Edwards.) “How nuclear war would affect Earth’s climate,” EarthSky, September 8, 2017, earthsky.org/human-world/how-nuclear-war-would-affect-earths-climate] Chaminade AS

We are not talking enough about the climatic effects of **nuclear war.** The “nuclear winter” theory of the mid-1980s played a significant role in the arms reductions of that period. But with the collapse of the Soviet Union and the reduction of U.S. and Russian nuclear arsenals, this aspect of nuclear war has faded from view. That’s not good. In the mid-2000s, climate scientists such as Alan Robock (Rutgers) took another look at nuclear winter theory. This time around, they used much-improved and much more detailed climate models than those available 20 years earlier. They also tested the potential effects of smaller nuclear exchanges. The result: an exchange involving just 50 nuclear weapons — the kind of thing we might see in an India-Pakistan war, for example — could loft 5 billion kilograms of smoke, soot and dust high into the stratosphere. That’s enough to cool the entire planet by about 2 degrees Fahrenheit (1.25 degrees Celsius) — about where we were during the Little Ice Age of the 17th century. Growing seasons could be shortened enough to create really significant food shortages. So the climatic effects of even a relatively small nuclear war would be planet-wide. What about a larger-scale conflict? A U.S.-Russia war currently seems unlikely, but if it were to occur, hundreds or even thousands of nuclear weapons might be launched. The climatic consequences **would be catastrophic:** global average **temperatures would drop** as much as **12 degrees Fahrenheit** (7 degrees Celsius) for up to several years — temperatures last seen during the great ice ages. Meanwhile, **smoke and dust** circulating in the stratosphere **would darken the atmosphere** enough **to inhibit photosynthesis,** causing disastrous crop failures, widespread famine and massive ecological disruption. The effect would be similar to that of the giant meteor believed to be responsible for the extinction of the dinosaurs. This time, we would be the dinosaurs. Many people are concerned about North Korea’s advancing missile capabilities. Is nuclear war likely in your opinion? At this writing, I think we are closer to a nuclear war than we have been since the early 1960s. In the North Korea case, both Kim Jong-un and President Trump are bullies inclined to escalate confrontations. President Trump lacks impulse control, and there are precious few checks on his ability to initiate a nuclear strike. We have to hope that our generals, both inside and outside the White House, can rein him in. North Korea would most certainly “lose” a nuclear war with the United States. But many millions would die, including hundreds of thousands of Americans currently living in South Korea and Japan (probable North Korean targets). Such vast damage would be wrought in Korea, Japan and Pacific island territories (such as Guam) that any “victory” wouldn’t deserve the name. Not only would that region be left with horrible suffering amongst the survivors; it would also immediately face famine and rampant disease. Radioactive fallout from such a war would spread around the world, including to the U.S. It has been more than 70 years since the last time a nuclear bomb was used in warfare. What would be the effects on the environment and on human health today? To my knowledge, most of the changes in nuclear weapons technology since the 1950s have focused on making them smaller and lighter, and making delivery systems more accurate, rather than on changing their effects on the environment or on human health. So-called “battlefield” weapons with lower explosive yields are part of some arsenals now — but **it’s** quite **unlikely that any exchange** between two nuclear powers **would stay limited** to these smaller, less destructive bombs.

**Subpoint B - The Ozone**

**The ozone is recovering now.**

**WMO 21**

[World Meteorological Organization; 2021; “Ozone layer recovery is an environmental success story,”<https://public.wmo.int/en/media/news/ozone-layer-recovery-environmental-success-story>] brett

The ozone layer in the upper atmosphere blocks ultraviolet (UV) radiation that harms living tissue, including humans and plants. The ozone “hole,” which was discovered in 1985 is the result of human emited chlorofluorocarbons (CFCs), which are ozone-depleting chemicals and greenhouse gases used as coolants in refrigerators and in aerosol spray. Nearly 200 countries signed the Montreal Protocol in 1987, which phased out the production and consumption of CFCs. **A new study** in Nature **demonstrates** that by **protecting the ozone layer**, which blocks harmful UV radiation, the Montreal Protocol also **protects plants** **and their ability to pull carbon from the atmosphere**. “**The Montreal Protocol began** life as a mechanism **to** protect and **heal the ozone layer**. It has done its job well over the past three decades. **The ozone layer is** **on the road to recovery**. The cooperation we have seen under the Montreal Protocol is exactly what is needed now to take on climate change, an equally existential threat to our societies,” said UN Secretary-General Antonio Guterres in a message. The most recent WMO /UN Environment Programme Scientific Assessment of Ozone Depletion, issued in 2018, concluded that the measures under the protocol will lead to the ozone layer on the path of recovery and to potential return of the ozone in the Arctic and Northern Hemisphere mid-latitude ozone before the middle of the century (~2035) followed by the Southern Hemisphere mid-latitude around mid-century, and Antarctic region by 2060 . Although the use of halons and chlorofluorocarbons  has been discontinued, they will remain in the atmosphere for many decades. Even if there were no new emissions, there is still more than enough chlorine and bromine present in the atmosphere to destroy ozone at certain altitudes over Antarctica from August to December. The formation of the ozone hole is still expected to be an annual spring event. Its size and depth are governed to a large degree by the meteorological conditions particular for the year. As of the first week of August 2021, the ozone hole reappeared and is rapidly growing and has extended to 23 million square kilometers on 13 September which is above the average since the mid 1980s. The lowest ozone value in the during this seasons was around 140 DU. The hole fluctuates in size annually and it usually reaches its largest area during the coldest months in the southern hemisphere, from late September to early October. Its evolution is monitored by satellites and ground-based observing stations of WMO’s Global Atmosphere Watch Programme. Those observations are being combined with numerical modelling by different organizations and institutions (NASA, the Copernicus Atmospheric Monitoring Service implemented by ECMWF, ECCC, KNMI and others) to provide near -real time information and analyses on the ozone levels at different parts of the stratosphere, the location and dimensions of the ozone depleted area. In 2020, there were exceptionally large ozone holes over the Antarctic and Arctic, reflecting extreme meteorological conditions. Specific dynamic conditions in the stratosphere in 2019 led to the smallest Antarctic ozone hole since its discovery.  This shows the need for continued vigilance and observations. Ozone and climate The theme for this year is Montreal Protocol – keeping us, our food and vaccines cool. Ozone depleting substances (ODS) are also greenhouse gases (GHG) and their abundance in atmosphere over the years has made an important contribution to the radiative forcing of climate. While ODS concentrations are expected to keep decreasing, the concentrations of long-lived greenhouse gases have been increasing. The distribution and amount of stratospheric ozone depends on temperature and circulation, so that changes in climate will affect the distribution of ozone. Long-lived greenhouse gases warm the troposphere, but cool the stratosphere, leading to changes of the global circulation, affecting the stability of the polar winter vortices, and changing weather patterns. Therefore, the future evolution of the ozone layer will be influenced by the concentrations of these long-lived greenhouse gases, and by climate change. The Montreal Protocol has led to very significant avoided warming and the Kigali amendment which regulates the hydrofluorocarbons (HFCs), CFCs and hydrochlorofluorocarbons (HCFCs) replacement gases, adds a further layer of important climate protection. The avoided ultraviolet radiation and climate change also have co-benefits for plants and their capacity to store carbon through photosynthesis. Some recent scientific findings point that the ozone depletion in the Arctic polar vortex could intensify by the end of the century unless global greenhouse gases are rapidly and systematically reduced. In the future, this could also mean more UV radiation exposure in Europe, North America and Asia when parts of the polar vortex drift south. Scientists are monitoring the extent to which climate change is leading to stratospheric cooling, which enhances the possibilities for observing temperatures under -78°C especially in the Arctic where there is evidence that the coldest stratospheric winters are becoming colder. Those temperatures are needed for the polar stratospheric cloud formation where the destruction of the ozone takes place.  UV Radiation Several feedbacks to climate change occur from the effects of UV radiation on the biosphere. For example, the **breakdown** or photodegradation of dead plant material releases carbon to the atmosphere, increasing the amount of carbon dioxide and other greenhouse gases. **Increased thawing** or melting of snow, ice and permafrost in the Arctic also **releases GHGs** and has a negative effect on the exposed ecosystems. Studies are showing that temperature, UV radiation and frequency of rainfall are key factors that determine the availability or range of suitable habitats for certain plant species to survive. UV-B radiation and factors associated with climate change affect plant growth, pathogen and pest defence, and food crop quality. For human health, UV radiation can have significant negative effects, for example, in causing skin cancers and certain eye diseases, such as cataract. However, the Montreal Protocol has played a major role in avoiding large numbers of cases and deaths. With regard to pollution, UV radiation can have a **substantial impact** on the composition and quality of the atmosphere; on human, terrestrial and aquatic **environment health**. It drives the breakdown of plastic pollutants with implications for human health and the environment.

**Mega Constellations of satellites and frequent re-entry causes an Ozone Hole**

**Tereza 21**

[Tereza; June 07, 2021; Bachelor's in Journalism and Master's in Cultural Anthropology from Prague's Charles University, Master's in Science from the International Space University. Space.com, “Air pollution from reentering megaconstellation satellites could cause ozone hole 2.0,”<https://www.space.com/starlink-satellite-reentry-ozone-depletion-atmosphere>] brett

**Chemicals** released as defunct satellites burn in the atmosphere could **damage Earth’s** protective **ozone** layer **if** plans to build **megaconstellations** of tens of thousands of satellites, such as SpaceX's Starlink, **go ahead** as foreseen, scientists warn. Researchers also caution that the poorly understood atmospheric processes triggered by those chemicals could lead to an uncontrolled geoengineering experiment, the consequences of which are unknown. For years, the space community was content with the fact that the amount of material that burns in the atmosphere as a result of Earth's encounters with meteoroids far exceeds the mass of defunct satellites meeting the same fate. Even the rise of megaconstellations won't change that. The problem, however, is in the different chemical composition of natural meteoroids compared to artificial satellites, according to Aaron Boley, an associate professor of astronomy and astrophysics at the University of British Columbia, Canada. "We have 54 tonnes (60 tons) of meteoroid material coming in every day," Boley, one of the authors of a paper published May 20 in the journal Scientific Reports, 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%." Related: SpaceX's Starlink satellite megaconstellation launches in photos Uncontrolled geoengineering The scientists realised that **megaconstellations** have a significant potential to change the chemistry of the upper atmosphere compared to its natural state. But not only that. The burning of aluminum is known to **produce** aluminum oxide, also known as **alumina**, **which** can **trigger** further unexplored side effects. "Alumina reflects light at certain wavelengths and if you dump enough alumina into the atmosphere, you are going to create scattering and eventually change the albedo of the planet," Boley said. Albedo is the measure of the amount of light that is reflected by a material. In fact, increasing Earth's albedo by pumping certain types of chemicals into the higher layers of the atmosphere has been proposed as a possible geoengineering solution that could slow down global warming. However, Boley said, the scientific community has rejected such experiments because not enough is known about their possible side effects. "Now it looks like we are going to run this experiment without any oversight or regulation," Boley said. "We don't know what the thresholds are, and how that will change the upper atmosphere." The Cygnus re-supply vehicle, which delivers cargo to the International Space Station, burning up in the **a**tmosphere during its reentry. (Image credit: ESA/Alexander Gerst) **Ozone hole** 2.0 The aluminum from re-entering satellites also has a potential to damage the ozone layer, a problem well known to humanity, which has been successfully solved by widespread bans on the use of chlorofluorocarbons, chemicals used in the past in aerosol sprays and refrigerators. In their paper, Boley and his colleague Michael Byers cite research by their counterparts from the Aerospace Corporation, a U.S. non-profit research organization, which identified local damage to the planet's ozone layer triggered by the passage of polluting rockets through the atmosphere. "We know that alumina does deplete ozone just from rocket launches themselves because a lot of solid-fuel rockets use, or have, alumina as a byproduct," Boley said. "That creates these little temporary holes in the stratospheric ozone layer. That's one of the biggest concerns about compositional changes to the atmosphere that spaceflight can cause." The ozone layer protects life on Earth from harmful UV radiation. The depletion of ozone in the stratosphere, the second lowest layer of the atmosphere extending between altitudes of approximately 7 to 40 miles (10 to 60 kilometers), led to an increased risk of cancer and eye damage for humans on Earth. Gerhard Drolshagen, of the University of Oldenburg, Germany, who has published papers about the effects of meteoroid material on Earth, told Space.com that **reentering satellites** usually **evaporate** at altitudes between 55 and 30 miles (90 and 50 km), just **above the ozone-rich stratosphere**. However, he added, the particles created as a result of the satellites' burning will eventually sink to the lower layers. Boley said that as the alumina sinks into the stratosphere, it will cause **[causing] chemical reactions, which,** based on existing knowledge, will likely **trigger ozone destruction**. Drolshagen, who wasn't involved in the recent study, agreed that because "satellites are mostly made of aluminum, the amount of aluminum deposited in the atmosphere will certainly increase." Concerns about the effects of aluminium oxides on the atmosphere have been cited by U.S. telecommunications operator Viasat in its request to the US Federal Communications Commision to suspend launches of SpaceX's Starlink megaconstellation until a proper environmental review of its possible impacts is conducted. Spectacular stratospheric clouds are linked to ozone destruction. (Image credit: NASA/Lamont Poole) Learning from past mistakes In their study, Boley and his colleagues looked only at the effects of the first generation of the Starlink megaconstellation, which is expected to consist of 12,000 satellites. More than 1,700 of these have already been launched. As a result of SpaceX's activities (and to a lesser extent those of other constellation operators), the number of active and defunct satellites in low Earth orbit, the region of space below the altitude of 620 miles (1,000 km), has increased by 50% over the past two years, according to the paper. "The problem is that there are now plans to launch about 55,000 satellites," Boley said. "Starlink second generation could consist of up to 30,000 satellites, then you have Starnet, which is China's response to Starlink, Amazon's Kuiper, OneWeb. That could lead to unprecedented changes to the Earth’s upper atmosphere." Megaconstellation operators, inspired by the consumer technology model, expect fast development of new satellites and **frequent replacement**, thus the **high amount of satellites** expected to be burning in the atmosphere on a daily basis.

**Ozone holes cause major consequences and can lead to extinction.**

**Skudlarek 16**

[Cooper, pollution writer for L2P, “The Ozone Layer,”<https://letters2president.org/letters/24312>] brett

We have a problem- a big problem (a 518,000,000 square kilometer problem to be exact). The ozone layer is a belt of naturally occurring gas that protects us from harmful radiation and it is at risk. We need to regulate the amount of air pollution produced and fossil fuels burned to prevent the formation of **ozone holes** which **allow radiation** to seep into the troposphere.

The Earth’s stratosphere is a part of our atmosphere that houses the earth’s ozone layer. The ozone layer is a belt of naturally occurring gas called ozone (hence the name ozone layer) that sits 15 kilometers above earth’s surface and shields us from a form of a form of radiation produced by the sun known as ultraviolet B radiation. Over the next 14 years the levels of carbon dioxide seeping into our atmosphere will have increased by nearly 40 percent. According to the website Conserve Energy Future, “An essential property of ozone molecule is its ability to block solar radiations of wavelengths less than 290 nanometers from reaching Earth’s surface. In this process, it also absorbs ultraviolet radiations that are **dangerous for most living beings**. UV radiation could injure or kill life on Earth. Though the absorption of UV radiations warms the stratosphere but it is important for life to flourish on planet Earth. **Research scientists** have **anticipated disruption** of susceptible terrestrial and aquatic ecosystems **due to depletion** of ozone layer.” This means that although it is necessary to keep our planet habitable it is only helpful if we have the right amount and we have far too much.

This is a major issue because the excess radiation caused by holes in the ozone layer is allowing immense amounts of solar radiation to seep into the troposphere (where we live). If humans (or any species for that matter) are exposed to too much of this radiation, then we can develop serious skin diseases including cancer. In addition, to that if the **plants** at the bottom of the food chain receive too much solar radiation, then they **will die out** **causing waves** of distortion **to ripple up the food chain and** the catastrophic **extinction** of many species that are vital to our survival. Finally, the **constant decay** of our ozone layer is **exponentially [accelerates]** accelerating **climate change**. This leads to things such as: global **warming**, **Arctic** Circle **thawing**, stronger **hurricanes**, **sea level rising**, and more.

**This contention links into my framework because collisions and ozone depletion lead to extinction which is the highest impact in the round.**

**(3:40)**

**Contention 2 - China**

**My second contention is that China is using private companies to outpace the US space industry which leads to major consequences.**

**China is rapidly increasing space involvement.**

**Campbell 19**

Campbell, C. (2019, July 17). *From Satellites to the Moon and Mars, China Is Quickly Becoming a* *Space Superpower*. Time. Retrieved December 14, 2021, from<https://time.com/5623537/china-space/> Graduate, Glasgow University. Following a move to Asia, initially worked as a travel writer based in Thailand before joining exiled Burmese media organization The Irrawaddy. 2013, joined TIME as Reporter and later as Associate Editor, Hong Kong office. Helped helm Hong Kong's overnight breaking news coverage on Time.com while still reporting on South-East Asia, including turbulent elections in Cambodia, the disappearance of Malaysia Airlines Flight 370, and Thailand's military coup. Interviewed four current Asian world leaders. Currently, TIME Correspondent, Beijing. // ech

It was perhaps only a matter of time before the Celestial Empire reached for the stars. **China’s** government has made conquering space a key strategic priority, with the nation’s reported $8 billion **space budget second only to the U.S.,** according to the Space Foundation, an American non-profit. Chinese scientists were early pioneers of rudimentary rockets back in the year 900, though only launched its first Long March rocket in 1970 on the back of Soviet technology, sending a human into space in 2003. Now, it’s **[is] making fast progress**. In January, China broke new ground by landing its Chang’e 4 lunar lander on the far side of the moon, which, due to the moon’s synchronous, tidally locked rotation, remains constantly hidden from Earth. There, China’s Jade Rabbit 2 rover was able to transmit data back to Earth via a satellite previously deployed around the moon to establish a radio link. In another first, a cotton seed was germinated onboard the Chang’e 4, which is named after China’s mythical moon goddess. After the mission, Chinese President Xi Jinping praised the “outstanding feats” that had “set a model for the whole [Chinese Communist] Party, the whole armed forces and people of all ethnic groups in China.” Such backing from the top underscores the scale of China’s ambitions. China already has the largest filled-aperture radio telescope in the world, which measures just over 1,640 feet across. Other than visiting Mars, China plans to send probes to asteroids, Jupiter and even Uranus. It also aims to build a scientific research station in the moon’s southern polar region, as well as establish its own sophisticated large-scale space station within 10 years. “They have [has] a strategic, long-term set of goals and work deliberately and systematically to achieve those goals,” says Kathy Laurini, who served as NASA’s senior advisor for Exploration and Space Operations, among other roles, during 36 years with the American space agency. Satellite launches are a priority, too. **China had 38 launches last year, more than any other country, as it attempts to catch up with the West’**s satellite infrastructure. And last month, China launched a rocket from a mobile platform in the Yellow Sea for the first time, sending five commercial satellites and two others containing experimental technology into orbit. The feat meant China is only the third country after the U.S. and Russia to master sea launches. The speed at which China is surpassing each technological hurdle spotlights how the **Beijing** government **views space as vital for** boosting **the economy and promoting** high-end **industry and spill-off tech**nologies. “They see space as a very important driver for growth and competitiveness going forward,” says Andrew Jones, a journalist specializing in China’s space program.

**Chinese private companies increasingly work towards joint goals with the government, showing China’s ability to circumvent norms by use of private entities.**

**Olson 20**

Olson, S. (2020, September 30). Are Private Chinese Companies Really Private? The Diplomat. Retrieved December 8, 2021, from https://thediplomat.com/2020/09/are-private-chinese-companies-really-private/ Mr. Olson began his career in Washington DC as an international trade negotiator and served on the US negotiating team for the NAFTA negotiations. //ear

China has often been criticized for a lack of transparency, especially with regard to its economic and trade policies. While in many cases these criticisms are valid, it belies the fact that in other instances, China is remarkably open and transparent about its intentions and ambitions. Such is the case with China’s “Opinion on Strengthening the United Front Work of the Private Economy in the New Era,” recently released by the Central Committee of the Chinese Communist Party (and further elaborated on by President Xi Jinping himself). This document tells us in no uncertain terms that **Chinese private companies** will be **increasingly called** upon **to conduct their operations in tight coordination with government**al policy **objectives** and ideologies**.** The rest of the world should take note. A Different Vision of “Private” Business The 5,000 word “opinion” aims to ratchet-up the role and influence of the CCP within the private sector in order “to better focus the wisdom and strength of the private businesspeople on the goal and mission to realize the great rejuvenation of the Chinese nation.” The objective is to establish a “united front” between business and government and facilitate the “enhancement of the party’s leadership over the private economy.” According to the plan, “private economic figures are to be more closely united around the party,” thereby achieving “a high degree of consistency with the Party Central Committee on political stand, political direction, political principles, and political roads.” All of **this stands in stark contrast to** long-accepted concepts of **how private companies function in a free market**. The overriding purpose of business, according to these traditional precepts, is to earn profits through the provision of value-added products and services, in response to marketplace signals and under the constraint of basic economic realities. Government ideology plays no role in that equation. Enjoying this article? Click here to subscribe for full access. Just $5 a month. But China has a very different vision. Government officials and government ideologies are directly infused into business operations. Private sector employees are “educated” on government policies and ideologies, with the expectation that this “enlightenment” will help inform their business decisions. This government-business symbiosis is further cemented by the provision of massive government subsidies (estimated to be about 3 percent of China’s GDP) to Chinese companies. To be clear, China – like any other sovereign nation – is entirely free to define the nature of the relationship between the Chinese state and the Chinese private sector, and craft its own economic development philosophies. So there can be no complaint with China for exercising its sovereignty.

**Unfortunately China’s use of private companies has been quite effective as China is overtaking US space supremacy**

**Harding 21**

[(Luke, a Guardian foreign correspondent. His book Shadow State is published by Guardian Faber. Click here for Luke's public key) “The space race is back on – but who will win?” The Guardian, 7/16/21.<https://www.theguardian.com/science/2021/jul/16/the-space-race-is-back-on-but-who-will-win>] RR

**The biggest challenge to US space supremacy** comes not from Russia – heir to the Soviet Union’s pioneering space programme, which launched the Sputnik satellite and got the first human into space in the form of Yuri Gagarin – **but from China.** In 2011 Congress prohibited US scientists from cooperating with Beijing. Its fear: scientific espionage. Taikonauts are banned from visiting the ISS, which has hosted astronauts from 19 countries over the past 20 years. The station’s future beyond 2028 is uncertain. Its operations may yet be extended in the face of increasing Chinese competition. In its annual threat assessment this April, the office of the US Director of National Intelligence (DNI) described China as a “near-peer competitor” pushing for global power. It warns: **“Beijing is working to match or exceed US capabilities in space to gain the military, economic, and prestige benefits that Washington has accrued from space leadership.”** The Biden administration suspects Chinese satellites are being used for non-civilian purposes. The People’s Liberation Army integrates reconnaissance and navigation data in military command and control systems, the DNI says. “Satellites are inherently dual use. It’s not like the difference between an F15 fighter jet and a 737 passenger plane,” Hilborne says. Once China completes the Tiangong space station next year, it is likely to invite foreign astronauts to take part in missions. One goal: to build new soft-power alliances. Beijing says interest from other countries is enormous. The low Earth orbit station is part of an ambitious development strategy in the heavens rather than on land – a sort of belt and rocket initiative. According to Alanna Krolikowski, an assistant professor at the Missouri University of Science and Technology, a “bifurcation” of space exploration is under way. In one emerging camp are states led by China and Russia, many of them authoritarian; in the other are democracies and “like-minded” countries aligned with the US. Russia has traditionally worked closely with the Americans, even when terrestrial relations were bad. Now it is moving closer to Beijing. In March, China and Russia announced plans to co-build an international lunar research station. The agreement comes at a time when Vladimir Putin’s government has been increasingly isolated and subject to western sanctions. In June, Putin and his Chinese counterpart Xi Jinping renewed a friendship treaty. Moscow is cosying up to Beijing out of necessity, at a time of rising US-China bipolarity. These rival geopolitical factions are fighting over a familiar mountainous surface: the moon. In 2019 a Chinese rover landed on its far side – a first. China is now planning a mission to the moon’s south pole, to establish a robotic research station and an eventual lunar base, which would be intermittently crewed. Nasa, meanwhile, has said it intends to put a woman and a person of colour on the moon by 2024. SpaceX has been hired to develop a lander. The return to the moon – after the last astronaut, commander Eugene Cernan, said goodbye in December 1972 – would be a staging post for the ultimate “giant leap”, Nasa says: sending astronauts to Mars. Krolikowski is sceptical that China will quickly overtake the US to become the world’s leading spacefaring country. “A lot of what China is doing is a reprisal of what the cold war space programmes did in the 1960s and 1970s,” she said. Beijing’s recent feats of exploration have as much to do with national pride as scientific discovery, she says. But there is no doubting Beijing’s desire to catch up, she adds. “The Chinese government has established, or has plans for, programmes or missions in every major area, whether it’s Mars missions, building mega constellations of telecommunications satellites, or exploring asteroids. There is **no single area of space activity they are not involved in.”** “We see a tightening of the Russia-China relationship,” Krolikowski says. “In the 1950s the Soviet Union provided a wide range of technical assistance to Beijing. Since the 1990s, however, the Russian space establishment has experienced long stretches of underfunding and stagnation. China now presents it with new opportunities.”

**The Impact - Hegemony**

**China rise is bad - it undermines US military superiority**

**Maher 16**

Maher 16 - Research Fellow in the Europe in the World program at the Robert Schuman Centre for Advanced Studies, European University Institute, San Domenico di Fiesole (FI), Italy. Richard Maher, 5-30-2016, "The Rise of China and the Future of the Atlantic Alliance," http://www.sciencedirect.com/science/article/pii/S0030438716300102, Date Accessed: 6-22-2016 //NM recut by HA

China's dramatic rise has been arguably the most important geopolitical development of the past two decades.4 **China has already become the** world's **second largest economy and second biggest military spender, and is the only country that could one day challenge the U**nited **S**tate**s’ status as the world's sole superpower**. Barring catastrophic internal convulsions in China, world politics thus seems headed toward a return to a kind of bipolarity, with the United States and China the two dominant powers in the international system. While a U.S.-China bipolar system would differ in many important respects from the bipolar system that existed during the Cold War, a return to a two-superpower world would affect international politics in profound ways, especially in alliance dynamics.5 As several analysts have pointed out,China likely will emerge as a much more formidable adversary for the United States than was the Soviet Union. China's gross domestic product (GDP) is expected to surpass that of the United States within the next decade. China is already the world's biggest exporter, the world's second biggest creditor (after Japan), and will soon become the world's largest importer. **China has** embarked on **a military** modernization program **that will make it a potent military competitor to the U**nited **S**tates, particularly in the coastal waters of the western Pacific. China—unlike the Soviet Union, which had a world-class military establishment but a dysfunctional economy—will thus become both an economic and a military superpower. And with its growing wealth and power, China will demand enhanced status and recognition.6 Geopolitical tensions between the United States and China are rising.7 As its power continues to grow, China will be more likely to challenge directly U.S. military supremacy in East Asia and the western Pacific.8 As a result, security issues increasingly dominate the U.S.-China agenda. As Aaron Friedberg has written, “The United States and the People's Republic of China are today locked in a quiet but increasingly tense struggle for power and influence, not only in Asia but around the world.”9 China increasingly shows signs of being a revisionist power, seeking changes in the regional and international systems that reflect its growing wealth and influence. Chinese President Xi Jinping has called for a “new type of great-power relationship” with the United States, for example, in which Washington acknowledges China's arrival as a great power and its sovereignty claims to contested islands in the East and South China Seas.10 Institutions like the China-led Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB) are designed to compete directly with U.S.-led institutions such as the World Bank and, with Japan, the Asian Development Bank (ADB). Tensions between China and several of its neighbors are also rising, many of which—including Japan, the Philippines, and Vietnam—are U.S. allies. In territorial and maritime disputes in the East and South China Seas, China has tried to intimidate its neighbors and force resolutions that would ensure its control of these contested areas. China and Japan nearly came to blows in 2012 over the Diaoyu/Senkaku Islands, for example, which are administered by Japan but also claimed by China.11 China has started to build military airfields on disputed reefs in the South China Sea and, in November 2013, announced an exclusive “air defense identification zone” over contested islands in the East China Sea. Both measures have been viewed by regional powers and the United States as a signal of a more assertive Chinese foreign policy, and have raised uncertainty, elevated hostilities, fuelled resentments, and made Chinese intentions in the region increasingly hard to understand.12 China is upgrading its nuclear arsenal, and determined to introduce multiple warheads on its most powerful long-range ballistic missile, the DF-5, which is capable of reaching the United States.13 For decades, China opted to maintain a minimal nuclear deterrent against potential aggression. This commitment is now questioned by the United States and other powers, and China's decision to make its most advanced nuclear weapons more lethal raises the fear of a potential nuclear arms race that was a core feature of the Cold War.14 China has made major investments in cyber technology and has created a powerful arsenal of cyber weapons.15 Cyberattacks against U.S. government and corporate sites that emanate from China are a central and increasingly divisive issue between the two governments. The United States accuses China of being engaged in widespread and systematic hacking, which has led to the theft of billions of dollars’ worth of intellectual property. U.S. officials believe that the purpose of Chinese “probes and attacks” on American computer networks is “both to steal intellectual property and prepare for future conflict.”16 China is expanding and modernizing its submarine force and building a second aircraft carrier, which will extend its power projection capabilities as far as the Indian Ocean and Persian Gulf.17 In late 2014, China sent submarines through the Persian Gulf for the first time, waters traditionally dominated by the U.S. Navy. Rather than trying to match America's global reach, however, **China**'s military modernization program **has focused on weapons systems designed to blunt U.S. tech**nological **superiority in the event of military conflict**, such as developing a means to disrupt American surveillance and communications satellites and expanding the accuracy and range of its tactical and ballistic missile systems.18 Several points of tension, thus, exist between China and the United States, and many analysts fear that forces are bringing the two countries into overt and sustained strategic competition. Even though European countries have an important stake in maintaining stability in the Asia-Pacific, it is unlikely that they will be able or willing to contribute much to a future U.S.-led balancing coalition again China. There are three main reasons why an EU contribution would be unlikely: divergent threat perceptions, limited strategic capabilities, and lower dependence on the United States today for their security. The remainder of this article will examine these factors in turn.

**United States hegemony in this decade is critical to prevent global war and peacefully end violent Chinese power-grabs**

**Erickson and Collins 21**

[(Andrew, A professor of strategy in the U.S. Naval War College’s China Maritime Studies Institute)(Gabriel, Baker Botts fellow in energy and environmental regulatory affairs at Rice University’s Baker Institute for Public Policy) “A Dangerous Decade of Chinese Power Is Here,” Foreign Policy, 10/18/2021]

U.S. and allied policymakers are facing the most important foreign-policy challenge of the 21st century. **China’s power is peaking**; so is the political position of Chinese President Xi Jinping and the Chinese Communist Party’s (CCP) domestic strength. In the long term, China’s likely decline after this peak is a good thing. But right now, it creates a decade of danger from a system that increasingly realizes it only has a short time to fulfill some of its most critical, long-held goals. Within the next five years, China’s leaders are likely to conclude that its deteriorating demographic profile, structural economic problems, and technological estrangement from global innovation centers are eroding its leverage to annex Taiwan and achieve other major strategic objectives. As **Xi** internalizes these challenges, hi**s foreign policy** **is** likely to become even **more accepting of risk, feeding on his** nearly decadelong **track record of** successful **revisionist action** against the rules-based order. Notable examples include China occupying and militarizing sub-tidal features in the South China Sea, ramping up air and maritime incursions against Japan and Taiwan, pushing border challenges against India, occupying Bhutanese and Tibetan lands, perpetrating crimes against humanity in Xinjiang, and coercively enveloping Hong Kong. The relatively low-hanging fruit is plucked, but Beijing is emboldened to grasp the biggest single revisionist prize: Taiwan. Beijing’s actions over the last decade have triggered backlash, such as with the so-called AUKUS deal, but concrete constraints on China’s strategic freedom of action may not fully manifest until after 2030. It’s remarkable and dangerous that China has paid few costs for its actions over the last 10 years, even as its military capacities have rapidly grown. Beijing will likely conclude that under current diplomatic, economic, and force postures for both “gray zone” and high-end scenarios, the 2021 to late 2020s timeframe still favors China—and is attractive for its 68-year-old leader, who seeks a historical achievement at the zenith of his career. **U.S. planners must** mobilize resources, effort, and risk acceptance to maximize power and thereby **deter Chinese aggression** in the coming decade—literally starting now—and innovatively employ assets that currently exist or can be operationally assembled and scaled within the next several years. That will be the first step to pushing back against China during the 2020s—a decade of danger—before what will likely be a waning of Chinese power. As Beijing aggressively seeks to undermine the international order and promotes a narrative of inevitable Chinese strategic domination in Asia and beyond, it creates a dangerous contradiction between its goals and its medium-term capacity to achieve them. China is, in fact, likely nearing the apogee of its relative power; and by 2030 to 2035, it will cross a tipping point from which it may never recover strategically. Growing headwinds constraining Chinese growth, while not publicly acknowledged by Beijing, help explain Xi’s high and apparently increasing risk tolerance. Beijing’s window of strategic opportunity is sliding shut. China’s skyrocketing household debt levels exemplify structural economic constraints that are emerging much earlier than they did for the United States when it had similar per capita GDP and income levels. Debt is often a wet blanket on consumption growth. A 2017 analysis published by the Bank for International Settlements found that once the household debt-to-GDP ratio in a sample of 54 countries exceeded 60 percent, “the negative long-run effects on consumption tend to intensify.” China’s household debt-to-GDP ratio surpassed that empirical danger threshold in late 2020. Rising debt service burdens thus threaten Chinese consumers’ capacity to sustain the domestic consumption-focused “dual circulation” economic model that Xi and his advisors seek to build. China’s growth record during the past 30 years has been remarkable, but past exceptionalism does not confer future immunity from fundamental demographic and economic headwinds. As debt levels continue to rise at an absolute level that has accelerated almost continuously for the past decade, China also faces a hollowing out of its working-age population. This critical segment peaked in 2010 and has since declined, with the rate from 2015 to 2020 nearing 0.6 percent annually—nearly twice the respective pace in the United States. While the United States faces demographic challenges of its own, the disparity between the respective paces of decline highlights its relative advantage compared to its chief geopolitical competitor. Moreover, the United States can choose to access a global demographic and talent dividend via immigration in a way China simply will not be able to do. Atop surging debt and worsening demographics, China also faces resource insecurity. China’s dependence on imported food and energy has grown steadily over the past two decades. Projections from Tsinghua University make a compelling case that China’s oil and gas imports will peak between 2030 and 2035. As China grapples with power shortages, Beijing has been reminded that supply shortfalls equal to even a few percentage points of total demand can have outsized negative impacts. Domestic resource insufficiency by itself does not hinder economic growth—as the Four Asian Tigers’ multi-decade boom attests. But China is in a different position. Japan and South Korea never had to worry about the U.S. Navy interdicting inbound tankers or grain ships. In fact, the United States was avowedly willing to use military force to protect energy flows from the Persian Gulf region to its allies. Now, as an increasingly energy-secure United States pivots away from the Middle East toward the Indo-Pacific, there is a substantial probability that energy shipping route protection could be viewed in much more differentiated terms—with oil and liquefied natural gas cargoes sailing under the Chinese flag viewed very differently than cargoes headed to buyers in other regional countries. Each of these dynamics—demographic downshifts, rising debts, resource supply insecurity—either imminently threatens or is already actively interfering with the CCP’s long-cherished goal of achieving a “moderately prosperous society.” Electricity blackouts, real estate sector travails (like those of Evergrande) that show just how many Chinese investors’ financial eggs now sit in an unstable $52 trillion basket, and a solidifying alignment of countries abroad concerned by aggressive Chinese behavior all raise questions about Xi’s ability to deliver. With this confluence of adverse events only a year before the next party congress, where personal ambition and survival imperatives will almost drive him to seek anointment as the only Chinese “leader for life” aside from former leader Mao Zedong, the timing only fuels his sense of insecurity. Xi’s anti-corruption campaigns and ruthless removal of potential rivals and their supporters solidified his power but likely also created a quiet corps of opponents who may prove willing to move against him if events create the perception he’s lost the “mandate of heaven.” Accordingly, the baseline assumption should be that Xi’s crown sits heavy and the **insecurity** induced **is** thereby intense **enough to drive high-stake**, high-consequence posturing and **action.** While Xi is under pressure to act, the external risks are magnified because so far, he has suffered few consequences from taking actions on issues his predecessors would likely never have gambled on. Reactions to party predations in Xinjiang and Hong Kong have been restricted to diplomatic-signaling pinpricks, such as sanctioning responsible Chinese officials and entities, most of whom lack substantial economic ties to the United States. Whether U.S. restraint results from a fear of losing market access or a belief that China’s goals are ultimately limited is not clear at this time. While the CCP issues retaliatory sanctions against U.S. officials and proclaims a triumphant outcome to its hostage diplomacy, these tactical public actions mask a growing private awareness that China’s latitude for irredentist action is poised to shrink. Not knowing exactly when domestic and external constraints will come to bite—but knowing that when Beijing sees the tipping point in its rearview mirror, major rivals will recognize it too—amplifies Xi and the party’s anxiety to act on a shorter timeline. Hence the dramatic acceleration of the last few years. Just as China is mustering its own strategic actions, so the United States must also intensify its focus and deployment of resources. **The U**nited **S**tates has taken too long to warm up and confront the central challenge, but it **retains formidable advantages**, agility, and the ability to prevail—**provided it goes all-in now.** Conversely, **if Washington fails** to marshal its forces promptly, its achievements after 2030 or 2035 will matter little. Seizing the 2020s would enable **Beijing** to ~~cripple~~ **[destroy] the** free and open **rules-based order and entrench its position by** economically **subjugating** regional **neighbors** (including key U.S. treaty allies) **to a degree that could offset** the **strategic headwinds** China now increasingly grapples with. **Deterrence** is never certain. But it **offers the highest probability of avoiding the certainty that** an Indo-Pacific region dominated by a CCP-led **China would doom** treaty allies, threaten **the U.S. homeland**, and likely set the stage for worse to come. Accordingly, U.S. planners should immediately mobilize resources and effort as well as accept greater risks to deter Chinese action over the critical next decade.     The greatest threat is armed conflict over Taiwan, where U.S. and allied success or failure will be fundamental and reverberate for the remainder of the century. There is a high chance of a major move against Taiwan by the late 2020s—following an extraordinary ramp-up in People’s Liberation Army capabilities and before Xi or the party state’s power grasp has ebbed or Washington and its allies have fully regrouped and rallied to the challenge. So how should policymakers assess the potential risk of Chinese action against Taiwan reaching dangerous levels by 2027 or possibly even earlier—as emphasized in the testimonies of Adms. Philip Davidson and John Aquilino? In June, Chairman of the Joint Chiefs Gen. Mark Milley testified to the House of Representatives that Xi had “challenged the People’s Liberation Army to accelerate their modernization programs to develop capabilities to seize Taiwan and move it from 2035 to 2027,” although China does not currently have the capabilities or intentions to conduct an all-out invasion of mainland Taiwan. U.S. military leaders’ assessments are informed by some of the world’s most extensive and sophisticated internal information. But what’s striking is open-source information available to everyone suggests similar things. Moving forward, a number of open-source indicators offer valuable “early warning lights” that can help policymakers more accurately calibrate both potential timetables and risk readings as the riskiest period of relations—from 2027 onward—approaches. Semiconductors supply self-sufficiency. Taiwan is the “OPEC+” of semiconductors, accounting for approximately two-thirds of global chip foundry capacity. A kinetic crisis would almost certainly disrupt—and potentially even completely curtail—semiconductor supplies. China presently spends even more each year on semiconductor imports (around $380 billion) than it does on oil, but much of the final products are destined for markets abroad. Taiwan is producing cutting-edge 5-nanometer and 7-nanometer chips, but China produces around 80 percent of the rest of the chips in the world. The closer China comes to being able to secure “good enough” chips for “inside China-only” needs, the less of a constraint this becomes. Crude oil, grain, strategic metals stockpiles—the commercial community (Planet Labs, Ursa Space Systems, etc.) has developed substantial expertise in cost-effectively tracking inventory changes for key input commodities needed to prepare for war. Electric vehicle fleet size—the amount of oil demand displaced by electric vehicles varies depending on miles driven, but the more of China’s car fleet that can be connected to the grid (and thus powered by blockade-resistant coal), the less political burden Beijing will face if it has to weather a maritime oil blockade imposed in response to actions it took against Taiwan or other major revisionist adventures. China’s passenger vehicle fleet, now approximately 225 million units strong, counts nearly 6.5 million electric vehicles among its ranks, the lion’s share of which are full-battery electrics. China’s State Council seeks to have 20 percent of new vehicles sold in China be electric vehicles by 2025. This target has already basically been achieved over the last few months, meaning at least 3.5 to 4 million (and eventually many more) new elective vehicles will enter China’s car fleet each year from now on. Local concentration of maritime vessels—snap exercises with warships, circumnavigations, and midline tests with swarms of aircraft highlight the growing scale of China’s threat to Taiwan. But these assets alone cannot invade the island. To capture and garrison, Beijing would need not only air, missile, naval, and special operations forces but also the ability to move lots of equipment and—at the very least—tens of thousands of personnel across the Taiwan Strait. As such, Beijing would have to amass maritime transport assets. And given the scale required, this would alter ship patterns elsewhere along China’s coast in ways detectable with artificial intelligence-facilitated imagery analysis from firms like Planet Labs (or national assets). Only the most formidable, agile **American** and allied **deterrence can kick the can down the road long enough for China’s slowdown** to shut the window of vulnerability. **Holding the line** is likely to **require** frequent and **sustained** proactive **enforcement** actions **to disincentivize** full-frontal **Chinese assaults** on the rules-based order in the Indo-Pacific. Chinese probing behavior and provocations must be met with a range of symmetric and asymmetric responses that impose real costs, such as publishing assets owned by Chinese officials abroad, cyber interference with China’s technological social control apparatus, “hands on” U.S. Navy and Coast Guard enforcement measures against Maritime Militia-affiliated vessels in the South China Sea, intensified air and maritime surveillance of Chinese naval bases, and visas and resettlement options to Hong Kongers, Uyghurs, and other threatened Chinese citizens—including CCP officials (and their families) who seek to defect and/or leave China. U.S. policymakers must make crystal clear to their Chinese counterparts that the engagement-above-all policies that dominated much of the past 25 years are over and the risks and costs of ongoing—and future—adventurism will fall heaviest on China.

**Essentially when the US is not the world’s sole superpower, deterrence is destroyed as there isn’t a stabilizing influence throughout the world.**

**US is the best to lead the world order – China and Russia are comparatively worse**

**Rogan 18**

[(Tom, foreign policy and national security writer for the Washington Examiner, Bachelor of Arts in War Studies from King's College London, a Master of Science in Middle East politics from SOAS, and a Graduate Diploma in Law from the University of Law, London, has previously written for The Washington Post, The Independent, The Atlantic, National Review, the Telegraph, and the Guardian) “China, Russia, and the greater morality of American realism,” Washington Examiner, 12/10/2018] JL

Crucially, however, unlike U.S. influence towards Saudi Arabia on issues like Yemen, neither China or Russia have any interest in influencing Maduro toward a greater morality. On the contrary, Xi and Putin are absolutely happy to see Venezuela's people starve, beg, and prostitute themselves just as long as Maduro does what they want him to do.

What's equally telling is that neither Xi nor Putin attempt to hide their selfish disregard for humanity.

Just last week Putin threw out the red carpet for Maduro as he visited Moscow to beg for investment. And Putin's whole offer of engagement with Saudi Arabia is built on the principle of absolute moral latitude.

In September, Maduro found similar friendliness as he visited China. In neither case did either leader privately or publicly pressure their ally to take greater action to reduce his peoples' grotesque human suffering. Predictably, Putin simply resorted to his worn KGB encyclopedia of trope-tastic un-realities. "We support," Putin told Maduro, "your efforts to achieve mutual understanding in society and all your actions aimed at normalizing relations with the opposition." Putin knows that Maduro's "efforts" have nothing to do with "normalizing relations" and everything to do with smashing the opposition. But Putin also knows his words lend fabric to his propaganda weavers.

Regardless, all the world should pay heed to the divergence between **American** realism **and Sino-Russian** realism, because the two **doctrines are far from similar**. Indeed, their divergence speaks to a multitude of other international realities such as **China's** concentration camp industry and **Pacific Ocean thievery, and Russia's** treatment of Syrian lungs, and **assassination adventurism**. This speaks to **a** simple truth: **Were China or Russia ever to displace the realism of the American-led international order, it would be disastrous for humanity**.

**This contention links into my framework because China overtaking US hegemony would escalate war which leads to mass suffering and death, which we must prevent at all costs under the framework minimizing suffering.**

**To prevent collisions, an ozone hole, and a destabilizing of international affairs, you must end private appropriation and err on the affirmative side. Thus, I strongly affirm today’s resolution and stand ready for cross ex.**

**u/v**

**Statistics prove that any reduction of existential threat is exponentially good.**

**Bostrom 12**

[Faculty of Philosophy and Oxford Martin School, University of Oxford.], Existential Risk Prevention as Global Priority.  Forthcoming book (Global Policy). MP. http://www.existenti...org/concept.pdf

Even if we use **the most conservative** of these **estimates**, which entirely ignores the   possibility of space colonization and software minds, **we find that the expected loss of an existential catastrophe is greater than the value of 10^16 human lives**.  **This implies that the expected value of reducing existential risk by a mere one millionth of one percent**age point **is at least a hundred times** the value of **a million human lives.**  The more technologically comprehensive estimate of 10  54 humanbrain-emulation subjective life-years (or 10  52  lives of ordinary length) makes the same point even   more starkly.  Even if we give this allegedly lower bound on the cumulative output potential of a   technologically mature civilization a mere 1% chance of being correct, we find that the expected   value of reducing existential risk by a mere one billionth of one billionth of one percentage point is worth   a hundred billion times as much as a billion human lives. **One might consequently argue that even the tiniest reduction of existential risk has** an   expected **value greater than that of** the **[definitely]** definite provision of **any ordinary good, such as the direct   benefit of saving 1 billion lives.**  And, further, that the absolute value of the indirect effect of saving 1  billion lives on the total cumulative amount of existential riskâ€”positive or negativeâ€”is almost   certainly larger than the positive value of the direct benefit of such an action.