## ac – blank space

### framework

#### Morality should be the highest value in today's debate, measured through the criterion of utilitarianism.

#### The most moral course of action is preventing extinction at all cost

Seth D. Baum and Anthony M. Barrett 18. Global Catastrophic Risk Institute. 2018. “Global Catastrophes: The Most Extreme Risks.” Risk in Extreme Environments: Preparing, Avoiding, Mitigating, and Managing, edited by Vicki Bier, Routledge, pp. 174–184.

2. What Is GCR And Why Is It Important? Taken literally, a global catastrophe can be any event that is in some way catastrophic across the globe. This suggests a rather low threshold for what counts as a global catastrophe. An event causing just one death on each continent (say, from a jet-setting assassin) could rate as a global catastrophe, because surely these deaths would be catastrophic for the deceased and their loved ones. However, in common usage, a global catastrophe would be catastrophic for a significant portion of the globe. Minimum thresholds have variously been set around ten thousand to ten million deaths or $10 billion to $10 trillion in damages (Bostrom and Ćirković 2008), or death of one quarter of the human population (Atkinson 1999; Hempsell 2004). Others have emphasized catastrophes that cause long-term declines in the trajectory of human civilization (Beckstead 2013), that human civilization does not recover from (Maher and Baum 2013), that drastically reduce humanity’s potential for future achievements (Bostrom 2002, using the term “existential risk”), or that result in human extinction (Matheny 2007; Posner 2004). A common theme across all these treatments of GCR is that some catastrophes are vastly more important than others. Carl Sagan was perhaps the first to recognize this, in his commentary on nuclear winter (Sagan 1983). Without nuclear winter, a global nuclear war might kill several hundred million people. This is obviously a major catastrophe, but humanity would presumably carry on. However, with nuclear winter, per Sagan, humanity could go extinct. The loss would be not just an additional four billion or so deaths, but the loss of all future generations. To paraphrase Sagan, the loss would be billions and billions of lives, or even more. Sagan estimated 500 trillion lives, assuming humanity would continue for ten million more years, which he cited as typical for a successful species. Sagan’s 500 trillion number may even be an underestimate. The analysis here takes an adventurous turn, hinging on the evolution of the human species and the long-term fate of the universe. On these long time scales, the descendants of contemporary humans may no longer be recognizably “human”. The issue then is whether the descendants are still worth caring about, whatever they are. If they are, then it begs the question of how many of them there will be. Barring major global catastrophe, Earth will remain habitable for about one billion more years 2 until the Sun gets too warm and large. The rest of the Solar System, Milky Way galaxy, universe, and (if it exists) the multiverse will remain habitable for a lot longer than that (Adams and Laughlin 1997), should our descendants gain the capacity to migrate there. An open question in astronomy is whether it is possible for the descendants of humanity to continue living for an infinite length of time or instead merely an astronomically large but finite length of time (see e.g. Ćirković 2002; Kaku 2005). Either way, the stakes with global catastrophes could be much larger than the loss of 500 trillion lives. Debates about the infinite vs. the merely astronomical are of theoretical interest (Ng 1991; Bossert et al. 2007), but they have limited practical significance. This can be seen when evaluating GCRs from a standard risk-equals-probability-times-magnitude framework. Using Sagan’s 500 trillion lives estimate, it follows that reducing the probability of global catastrophe by a mere one-in-500-trillion chance is of the same significance as saving one human life. Phrased differently, society should try 500 trillion times harder to prevent a global catastrophe than it should to save a person’s life. Or, preventing one million deaths is equivalent to a one-in500-million reduction in the probability of global catastrophe. This suggests society should make extremely large investment in GCR reduction, at the expense of virtually all other objectives. Judge and legal scholar Richard Posner made a similar point in monetary terms (Posner 2004). Posner used $50,000 as the value of a statistical human life (VSL) and 12 billion humans as the total loss of life (double the 2004 world population); he describes both figures as significant underestimates. Multiplying them gives $600 trillion as an underestimate of the value of preventing global catastrophe. For comparison, the United States government typically uses a VSL of around one to ten million dollars (Robinson 2007). Multiplying a $10 million VSL with 500 trillion lives gives $5x1021 as the value of preventing global catastrophe. But even using “just" $600 trillion, society should be willing to spend at least that much to prevent a global catastrophe, which converts to being willing to spend at least $1 million for a one-in-500-million reduction in the probability of global catastrophe. Thus while reasonable disagreement exists on how large of a VSL to use and how much to count future generations, even low-end positions suggest vast resource allocations should be redirected to reducing GCR. This conclusion is only strengthened when considering the astronomical size of the stakes, but the same point holds either way. The bottom line is that, as long as something along the lines of the standard riskequals-probability-times-magnitude framework is being used, then even tiny GCR reductions merit significant effort. This point holds especially strongly for risks of catastrophes that would cause permanent harm to global human civilization. The discussion thus far has assumed that all human lives are valued equally. This assumption is not universally held. People often value some people more than others, favoring themselves, their family and friends, their compatriots, their generation, or others whom they identify with. Great debates rage on across moral philosophy, economics, and other fields about how much people should value others who are distant in space, time, or social relation, as well as the unborn members of future generations. This debate is crucial for all valuations of risk, including GCR. Indeed, if each of us only cares about our immediate selves, then global catastrophes may not be especially important, and we probably have better things to do with our time than worry about them. While everyone has the right to their own views and feelings, we find that the strongest arguments are for the widely held position that all human lives should be valued equally. This position is succinctly stated in the United States Declaration of Independence, updated in the 1848 Declaration of Sentiments: “We hold these truths to be self-evident: that all men and 3 women are created equal”. Philosophers speak of an agent-neutral, objective “view from nowhere” (Nagel 1986) or a “veil of ignorance” (Rawls 1971) in which each person considers what is best for society irrespective of which member of society they happen to be. Such a perspective suggests valuing everyone equally, regardless of who they are or where or when they live. This in turn suggests a very high value for reducing GCR, or a high degree of priority for GCR reduction efforts.

### advantage 1 is capitalism bad

#### Space is the new spatial fix for capitalistkind – capitalism’s inherent expansionist nature means that space development perpetuates capitalism by allowing a new site for surplus capital and innovation to avoid terrestrial economic crises. Profit-first solutions ensures exhaustion and colonization of Blank Space.

Shammas and Holen 19 (Victor L. Shammas and Tomas B. Holen, 1-29-2019, "One giant leap for capitalistkind: private enterprise in outer space," Nature, <https://www.nature.com/articles/s41599-019-0218-9>)//kh

No longer terra nullius, space is now the new terra firma of capitalistkind: its naturalized terroir, its next necessary terrain. The logic of capitalism dictates that capital should seek to expand outwards into the vastness of space, a point recognized by a recent ethnography of NewSpace actors (Valentine, 2016, p. 1050). The operations of capitalistkind serve to resolve a series of (potential) crises of capitalism, revolving around the slow, steady decline of spatial fixes (see e.g., Harvey, 1985, p. 51–66) as they come crashing up against the quickly vanishing blank spaces remaining on earthly maps and declining (terrestrial) opportunities for profitable investment of surplus capital (Dickens and Ormrod, 2007a, p. 49–78).

A ‘spatial fix' involves the geographic modulation of capital accumulation, consisting in the outward expansion of capital onto new geographic terrains, or into new spaces, with the aim of filling a gap in the home terrains of capital. Jessop (2006, p. 149) notes that spatial fixes may involve a number of strategies, including the creation of new markets within the capitalist world, engaging in trade with non-capitalist economies, and exporting surplus capital to undeveloped or underdeveloped regions. The first two address the problem of insufficient demand and the latter option creates a productive (or valorizing) outlet for excess capital. Capitalism must regularly discover, develop, and appropriate such new spaces because of its inherent tendency to generate surplus capital, i.e., capital bereft of profitable purpose. In Harvey’s (2006, p. xviii) terms, a spatial fix revolves around ‘geographical expansions and restructuring…as a temporary solution to crises understood…in terms of the overaccumulation of capital'. It is a temporary solution because these newly appropriated spaces will in turn become exhausted of profitable potential and are likely to produce their own stocks of surplus capital; while ‘capital surpluses that otherwise stood to be devalued, could be absorbed through geographical expansions and spatio-temporal displacements' (Harvey, 2006, p. xviii), this outwards drive of capitalism is inherently limitless: there is no end point or final destination for capitalism. Instead, capitalism must continuously propel itself onwards in search of pristine sites of renewed capital accumulation. In this way, Harvey writes, society constantly ‘creates fresh productive powers elsewhere to absorb its overaccumulated capital' (Harvey, 1981, p. 8).

Historically, spatial fixes have played an important role in conserving the capitalist system. As Jessop (2006, p. 149) points out, ‘The export of surplus money capital, surplus commodities, and/or surplus labour-power outside the space(s) where they originate enabled capital to avoid, at least for a period, the threat of devaluation'. But these new spaces for capital are not necessarily limited to physical terrains, as with colonial expansion in the nineteenth century; as Greene and Joseph (2015) note, various digital spaces, such as the Internet, can also be considered as spatial fixes: the Web absorbs overaccumulated capital, heightens consumption of virtual and physical goods, and makes inexpensive, flexible sources of labor available to employers. Greene and Joseph offer the example of online high-speed frequency trading as a digital spatial fix that furthers the ‘annihilation of space by time' first noted by Marx in his Grundrisse (see Marx, 1973, p. 524).

Outer space serves at least two purposes in this regard. In the short-to medium-term, it allows for the export of surplus capital into emerging industries, such as satellite imaging and communication. These are significant sites of capital accumulation: global revenues in the worldwide satellite market in 2016 amounted to $260 billion (SIA, 2017, p. 4). Clearly, much of this activity is taking place ‘on the ground'; it is occurring in the ‘terrestrial economy'. But all that capital would have to find some other meaningful or productive outlet were it not for the expansion of capital into space. Second, outer space serves as an arena of technological innovation, which feeds back into the terrestrial economy, helping to avert crisis by pushing capital out of technological stagnation and innovation shortfalls.

In short, outer space serves as a spatial fix. It swallows up surplus capital, promising to deliver valuable resources, technological innovations, and communication services to capitalists back on Earth. This places outer space on the same level as traditional colonization, analyzed in Hegel’s Philosophy of Right, which Hegel thought of as a product of the ‘inner dialectic of civil society', which drives the market to ‘push beyond its own limits and seek markets, and so its necessary means of subsistence, in other lands which are either deficient in the goods it has overproduced, or else generally backward in creative industry, etc.' (Hegel, 2008, p. 222). In this regard, SpaceX and related ventures are not so very different from maritime colonialists and the trader-exploiters of the British East India Company. But there is something new at stake. As the Silicon Valley entrepreneur Peter Diamandis has gleefully noted: ‘There are twenty-trillion-dollar checks up there, waiting to be cashed!' (Seaney and Glendenning, 2016). Capitalistkind consists in the naturalization of capitalist consciousness and practice, the (false) universalization of a particular mode of political economy as inherent to the human condition, followed by the projection of this naturalized universality into space—capitalist humanity as a Fukuyamite ‘end of history', the end-point of (earthly) historical unfolding, but the starting point of humanity’s first serious advances in space.

#### Corporate space exploration is the harbinger of the latest stage of spectacle capitalism that justifies the flattening of humanity in favor of silly space-rock profits!!!

Shammas and Holen 19 (Victor L. Shammas and Tomas B. Holen, 1-29-2019, "One giant leap for capitalistkind: private enterprise in outer space," Nature, <https://www.nature.com/articles/s41599-019-0218-9>)//kh

In an interview, Beck was quizzed about the Humanity Star and asked by a reporter about the difficulties of generating profits in space (Tucker, 2018). To this Beck replied, ‘It has always been a government domain, but we’re witnessing the democratization of it…[I]t [is] turning into a commercially dominated domain'. Beck established an equivalence established between the dissolution of space as the rightful domain of states and the advent of profitmaking ventures as signs of ‘democratization'. In space, according to Beck’s logic, democratization involves the disappearance of the state and the rise of capital. The argument, of course, is impeccably post-statist: on this account, states are monolithic, conservative Leviathans beyond the reach of popular control; corporations, on the other hand, are in principle representatives of the everyman: in the age of the start-up, any humble citizen could in theory become an agent of disruption, a force for change, an explorer of space, and a potential member of the cadre of capitalistkind. Following this logic, the question for the entrepreneurs of NewSpace is how to monetize outer space, which means turning space into a space for capital; their question is how they can deplanetarize capital and universalize it, literally speaking, that is, turn the Universe into a universe for capital. In this light, Peter Beck’s distortion of democratic ideals appears eminently sensible, equating democratization with monetization, that is, capital liberated from its earthly tethers.

Emblematic of this capitalist turn in space was the founding of Moon Express in 2011, composed of a ‘team of prominent Silicon Valley entrepreneurs…shooting for the moon with a new private venture aimed at scouring the lunar surface for precious metals and rare metallic elements' (Hennigan, 2011). Following Google’s Lunar XPRIZE—an intertwining of Silicon Valley and NewSpace’s capitalistkind—which promised a $20 million prize for the first private company to land a spacecraft on the Moon, travel 500 meters, and transmit high-definition images back to Earth, all by March 2018,9 Moon Express claimed that it would be capable of landing on the lunar surface and earn the cash prize. Their stated goal was twofold: first, to mine rare resource like Helium-3 (a steadily dwindling scarce resources on Earth), gold, platinum group metals, and water, and, second, to carry out scientific work that would ‘help researchers develop human space colonies for future generations' (Ioannou, 2017). The ordering is telling: first profits, then humanity. These were the hollow, insubstantial promises of a venture-capitalized NewSpace enterprise: in early 2018, Google announced that none of the five teams competing for the Lunar XPRIZE, including Moon Express, would reach their stated objectives by the 31 March deadline and they were taking their money back (Grush, 2018). In this sense, it was typical for NewSpace in its formative years: a corporate field populated by (overly exuberant) private enterprises who promised more than they could deliver. But the belief in NewSpace is real enough. In a tome bursting with the optimism of NewSpace, Wohlforth and Hendrix claim that ‘the commercial spaceflight industry is transforming our sense of possibility. Using Silicon Valley’s money and innovative confidence, it will soon bring mass space products to the market' (2016, p. 7).

The trope of humanity plays a key role in the rhetoric of the adherents of NewSpace. To fulfill the objectives of NewSpace, including profit maximization and the exploitation of celestial bodies, the symbolic figure of a shared humanity serves a useful purpose, camouflaging the conquest of space by capitalism with a dream of humanity boldly venturing forth into the dark unknown, thereby also providing the legitimacy and enthusiasm needed to support bolster the legitimacy of NewSpace. So long as the stargazers and SpaceX watchers are permitted their fill of ‘collective effervescence', to use Durkheim’s (1995, p. 228) concept, capitalist entrepreneurs will be able to pursue their business interests more or less as they please. The spectacle of outer space is crucial in this regard.

Crucially, however, and despite this spectacle, SpaceX’s technology might not necessarily be more sophisticated than its competitors or predecessors. Some industry insiders have rebuffed some of the more the spectacular claims of NewSpace’s proponents, arguing that launch vehicle reusability requires a (perhaps prohibitively) expensive refurbishing of the rocket engines involved in launches: ‘The economics will depend on how many times a booster can be flown, and how much the individual expense will be to refurbish the booster…each time' (Chang, 2017). Reusability may be a technological dead-end because of the inherently stressful effects of a rocket launch on the launch vehicle’s components, with extreme limitations on reusability beyond second-use as well as added risks of malfunctions that customers and insurers are likely to wish to avoid. Furthermore, the Falcon Heavy still has not matched the power and payload capacity of NASA’s Saturn V, a product of 1960s militaryindustrial engineering and Fordist state spending programs. What SpaceX and other NewSpace corporations do with great ingenuity, however, is to manage the spectacle of outer space, producing outpourings of public fervor, aided by a widespread adherence to the ‘Californian Ideology' (Barbrook and Cameron, 1996), or post-statist techno-utopianism, in many postindustrialized societies.

The very centrality of these maneuvers has initiated a new phase in the history of capitalist relations, that of ‘charismatic accumulation'—certainly not in the sense of any ‘objective' or inherent charismatic authority, but with a form of illusion, to speak with Bourdieu, vested in the members of capitalistkind by their uncanny ability to spin mythologizing self-narratives. This has always been part of the capitalist game, from Henry Ford and onwards, but the charismatic mission gains a special potency in the grandiose designs of NewSpace’s entrepreneurs. Every SpaceX launch is a quasi-religious spectacle, observed by millions capable of producing a real sense of wonder in a condition of (legitimizing) collective effervescence.

Outer space necessarily reduces inter-human difference to a common denominator or a shared species-being. An important leitmotiv in many Hollywood science fiction movies, including Arrival (2016), is that a first encounter with an alien species of intelligent beings tends to flatten all human difference (including ethnoracial and national categories), thereby restoring humankind to its proper universality (see also Novoa, 2016). Ambassadors of Earth as a whole, not representatives of particular nations, step forth to meet alien emissaries. But even in the absence of such an encounter, the search for habitable domains (or rather, profitable locales) beyond Earth will necessarily forge a shared conception of the human condition, initiated with the Pale Blue Dot photograph in 1990. Typical of this sentiment are the words of the astronomer Carl Sagan, who famously observed of this photograph: ‘On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives'.

This naïvely humanistic vision has been one of the dominant tropes in the discourse on space since the 1950s, and it remains strong today, as with the claims of the United Nations Office for Outer Space Affairs (UNOOSA) that their task is to ‘uphold the vision of a more equitable future for all humankind through shared achievements in space'. This representational tendency mobilizes humanism to generate enthusiasm about space-related activities. But such representations are increasingly being recuperated by capitalist enterprise, so that it is not humankind but its modulation by space capitalists that will launch into the dark unknown. It is not humankind but capitalistkind that ventures forth. In early 2018, NASA was set to request $150 million in its 2019 budget to ‘enable the development and maturation of commercial entities and capabilities which will ensure that commercial successors to the ISS…are operational when they are needed', only one of many signs that space is becoming a space for capitalism. According to one estimate, the value of just one single asteroid would be more than $20 trillion in rare earth and platinum-group metals (Lewis, 1996), a precious prize indeed for profit-hungry corporations.10 Even the UNOOSA spoke vociferously in favor of the commercialization of space, appealing variously to the ‘industry and private sector' and elevating the ‘space economy' to a central pillar in its Space2030 Agenda (including the ‘use of resources that create and provide value and benefits to the world population in the course of exploring, understanding and utilizing space'), even as the UN agency falls back on a humanistic, almost social-democratic vision of the equitable distribution of benefits (and profits) from space mining, exploration, and colonization (UNOOSA, 2018).

**Capitalism is unsustainable and causes existential environmental obliteration, global structural violence, and imperial expansion.**

**Robinson 18** (William, Prof. of Sociology, Global and International Studies, and Latin American Studies, @ UC-Santa Barbara, “Accumulation Crisis and Global Police State,” 2018, <https://journals.sagepub.com/doi/10.1177/0896920518757054>)

Each major episode of crisis in the world capitalist system has presented the potential for systemic change. Each has involved the breakdown of state legitimacy, escalating class and social struggles, and military conflicts, leading to a restructuring of the system, including new institutional arrangements, class relations, and accumulation activities that eventually result in a restabilization of the system and renewed capitalist expansion. The current crisis shares aspects of earlier system-wide structural crises, such as of the 1880s, the 1930s or the 1970s. But there are six interrelated dimensions to the current crisis that I believe sets it apart from these earlier ones and suggests that a simple restructuring of the system will not lead to its restabilization – that is, our very survival now requires a revolution against global capitalism (Robinson, 2014). These six dimensions, in broad strokes, present a “big picture” context in which a global police state is emerging.

First, the system is fast reaching the ecological limits of its reproduction. We have already passed tipping points in climate change, the nitrogen cycle, and diversity loss. For the first time ever, human conduct is intersecting with and fundamentally altering the earth system in such a way that threatens to bring about a sixth mass extinction (see, e.g., Foster et al., 2011; Moore, 2015). These ecological dimensions of global crisis have been brought to the forefront of the global agenda by the worldwide environmental justice movement. Communities around the world have come under escalating repression as they face off against transnational corporate plunder of their environment. While capitalism cannot be held solely responsible for the ecological crisis, it is difficult to imagine that the environmental catastrophe can be resolved within the capitalist system given capital’s implacable impulse to accumulate and its accelerated commodification of nature.

Second, the level of global social polarization and inequality is unprecedented. The richest one percent of humanity in 2016 controlled over half of the world’s wealth and 20 percent controlled 95 percent of that wealth, while the remaining 80 percent had to make do with just five percent (Oxfam, 2017). These escalating inequalities fuel capitalism’s chronic problem of overaccumulation: the TCC cannot find productive outlets to unload the enormous amounts of surplus it has accumulated, leading to chronic stagnation in the world economy (see next section). Such extreme levels of social polarization present a challenge of social control to dominant groups. As Trumpism in the United States as well as the rise of far-right and neo-fascist movements in Europe so well illustrate, cooptation also involves the manipulation of fear and insecurity among the downwardly mobile so that social anxiety is channeled towards scapegoated communities. This psychosocial mechanism of displacing mass anxieties is not new, but it appears to be increasing around the world in the face of the structural destabilization of capitalist globalization. Extreme inequality requires extreme violence and repression that lend themselves to projects of 21st century fascism.

Third, the sheer magnitude of the means of violence and social control is unprecedented, as well as the magnitude and concentrated control over the means of global communication and the production and circulation of symbols, images, and knowledge. Computerized wars, drone warfare, robot soldiers, bunker-buster bombs, a new generation of nuclear weapons, satellite surveillance, cyberwar, spatial control technology, and so forth, have changed the face of warfare, and more generally, of systems of social control and repression. We have arrived at the panoptical surveillance society, a point brought home by Edward Snowden’s revelations in 2013, and the age of thought control by those who control global flows of communication and symbolic production. If global capitalist crisis leads to a new world war the destruction would simply be unprecedented.

Fourth, we are reaching limits to the extensive expansion of capitalism, in the sense that there are no longer any new territories of significance to integrate into world capitalism and new spaces to commodify are drying up. The capitalist system is by its nature expansionary. In each earlier structural crisis, the system went through a new round of extensive expansion – from waves of colonial conquest in earlier centuries, to the integration in the late 20th and early 21st centuries of the former socialist countries, China, India and other areas that had been marginally outside the system. There are no longer any new territories to integrate into world capitalism. At the same time, the privatization of education, health, utilities, basic services, and public lands is turning those spaces in global society that were outside of capital’s control into “spaces of capital,” so that intensive expansion is reaching depths never before seen. What is there left to commodify? Where can the system now expand? New spaces have to be violently cracked open and the peoples in these spaces must be repressed by the global police state.

### advantage 2 is china war.

#### New Space threatens to upset the precarious, rivalry-filled balance in outer space now

Prazak 21 (J. Pražák, 2021, "Dual-use conundrum: Towards the weaponization of outer space?" Acta Astronautica, doi: https://doi.org/10.1016/j.actaastro.2020.12.051)//kh

Outer space is an independent strategic domain with increasing importance. NATO proclaimed outer space as a new operational domain in November 2019, alongside air, land, sea, and cyber to enhance cooperation and share of capabilities [4]. However, the space environment shares certain analogies to traditional domains. Space has its distinguished Lines of Communication, Common Routes, Choke Points, or Harbor Accesses that may be exploited for space dominance [5]. Alfred Thayer Mahan observed it is impossible to occupy all the seas and oceans, nevertheless, it is possible to choose the strategy based on the control over chokepoints and strategic locations with only the limited amount of forces and resources. Outer space provides similar opportunities. For instance, Low Earth orbit or geostationary orbit may be deemed as critical space locations. Hohmann transfer orbit can be then regarded as a common route since it utilized for a two-phase manoeuvre to transit into a higher orbit. Accordingly, it was illustrated that space conquest might be a difficult but plausible task to achieve. Notwithstanding, it must be acknowledged three-dimensional movement of high velocities and global nature of space operations magnify its complexity, namely concerning propulsion requirements for overcome gravity wells of space objects [6].

Dolman [7] claims there is a scarcity of coherent space strategies, despite the significant interest in space domination since 1946. Already in 1961, the astronomical community agreed that outer space consists of strategic locations that could be compared to the strategic importance of the Panama Canal. In 1991, Arthur C. Clarke referred to the Gulf War as “the world’s first satellite war.” [8] Though such a claim may sound fairly exaggerated that time, the space systems considerably developed and functions that were underestimated a few decades ago such as navigation, communication, commercial imaging or weather prediction are nowadays indispensable. Military operations are dependent on space technology and provide important Command, Control, Communications and Intelligence (C3I) and other mission support. Above all, already at the very beginning of our millennia, Dolman concluded that “(…) space warfare has emerged from its embryonic stage and is now fully in its infancy.” [6] The question of the peaceful or conflictual character of outer space thus remains open.

The space relations and peaceful uses of outer space are currently characterized by two distinguished shifts – (1) the conflictual nature of major space powers is well projected in recent development in space rivalry and (2) emergence of New Space featured by growing commercialization of space sector. Though the end of the Cold War brought a decade of seemingly peaceful space development during the 1990s, the new millennium increased Sino-American competition challenging the U.S. space hegemony. China conducted a successful ASAT test in 2007, resulting not only in the new era of weapon development but also in the unprecedented proliferation of space debris. The U.S. sealed their space dominance a year later in 2008 by de-orbiting their USA-193 satellite using modified Standard Missile-3 (SM-3) as an ASAT and thus continued their ASAT tests that were halted in 1985. Albeit the official claim was to prevent contamination from 454-kg hydrazine tank attached to the satellite in case it survived re-entry, it was also a clear statement of the U.S. willingness to use power in space [10]. Concurrently, other major space powers do not wish to be disadvantaged, Russia possesses ASAT technology with LEO operability and employs advanced electronic and cyber capabilities [11] and India conducted a successful ASAT test in March 2019 [12]. The willingness of states to protect their space assets is reflected in the space policies. The U.S. is moving towards the establishment of Space Force as a sixth branch of the military [13], re-activation of the U.S. Space Command and recognition of space as a warfighting domain in reaction to Chinese and Russian development of kinetic and electronic weapons [14,15]. Other spacefaring nations similarly realize the need to protect their space assets. France intends to deploy small bodyguard satellites with cameras and presumably defensive weapons by 2023 [16] and a new generation of Syracuse satellites with capabilities to detect and disable1 enemy space satellites by 2030 [17]. Norway’s two satellites that are planned to be deployed in 2022 to provide broadband coverage over strategic Arctic region will likely carry anti-jamming, anti-radiation and other enhanced protective measures against interference [18]. The second important point is the emergence of so-called New Space. The new commercial actors are penetrating space business and introducing new technological developments. Though they are driven by profit and making space technology cheaper, at the same moment, they possess a risk of deployment of potentially hazardous dual-use technology [10].

3. Dual-Use and Space Weapon Conundrum

U.S. Department of Defence (DoD) defines dual-use technology as “(…) a technology, that has both military utility and sufficient commercial potential to support a viable industrial base.” [19] Until the end of the Cold War, the U.S. space industry was divided into four sectors – military, intelligence, civilian, and commercial. However, after the Cold War Department of Defence became visibly interested in dual-use capabilities. Moreover, the role of the commercial sector changed rapidly during recent years and got significant importance. Specifically, in the case of the U.S., the government does not need to invest in technologies that were already researched and development by commercial actors. For that, the U.S. government established the Dual Use Science and Technology program to ensure its access to dual-use technology and both government and military are dependant to commercial technology. On the other hand, commercial technology is available to many other customers and actors. For example, during Operation Iraqi Freedom, Saddam Hussein obtained Russian-made jamming equipment on the Internet and utilized it against the U.S. [19]. Global Navigation Satellite Systems (GNSS) is an essential strategic dual-use asset. Both American GPS and Russian GLONASS are exploited for both military and civilian purposes [20]. Navigation satellites can guide civilian airliners as well as munition with precision accuracy and serve as a force multiplier for ground military operations. Though some dual-use capabilities are evident – military rockets, launchers and missiles are based on the same basis as a technology for space flights, some distinctions are less noticeable. For example, the Soviet Union perceived American space shuttles as potential weapons that could conduct rendezvous and proximity operation to destroy the Soviet satellites with a robotic arm or similar device. Johnson-Freese concluded only the planet and solar physics research has apparent civil utilization. Nevertheless, even this technology may have military implications in the future [19].

#### Escalation via fights for space hegemony is imminent and spans across space, collapsing deterrence on Earth hotspots– further investment and commercialization only fails against China's economic prowess

Zhen 19 (Liu Zhen, 6-17-2019, "Are China and US racing towards confrontation in outer space?" South China Morning Post, https://www.scmp.com/news/china/military/article/3014692/are-china-and-us-racing-towards-inevitable-military)//kh

This story is part of an ongoing series on US-China relations produced jointly by the South China Morning Post and POLITICO, with reporting from Asia and the United States. A top Chinese general has a warning for any US leaders planning an arms race in space: be prepared to lose. Outspending a rival power into economic exhaustion might have helped the US win the cold war, said Qiao Liang, a major general in the Chinese air force who co-wrote the book Unrestricted Warfare: China’s Master Plan to Destroy America. But he said it would not work against a wealthy manufacturing powerhouse like China. “China is not the Soviet Union,” Qiao said in an interview with the South China Morning Post, a news partner of POLITICO. “If the United States thinks it can also drag China into an arms race and take down China as it did with the Soviets … in the end, probably it would not be China who is down on the ground.” Qiao’s words come as both Washington and Beijing are pouring money and resources into an increasingly militarised space race that some security specialists and former US officials fear is heightening the risk of war. The aggressive manoeuvres include US President Donald Trump’s proposal for a stand-alone Space Force – which Qiao dismissed as “an unwise move” – and efforts by both countries to develop laser and cyber weapons that could take out each other’s satellites. The rivalry is plainly on the minds of leaders at the Pentagon, which cites “space” 86 times in a new threat assessment of China’s military. It also warns that the People’s Liberation Army (PLA) is working on “enabling long-range precision strikes” and developing directed-energy weapons for use in orbit. Trump, Vice-President Mike Pence and a slew of US military leaders have cited China’s military space programmes as a key rationale for proposing the Space Force, which would gather nearly all the defence department’s space-related programmes into a new military branch – similar to the one China created four years ago. Congress is considering the administration’s plan, although some defence hawks are sceptical. Pence has also expressed alarm at China’s success in landing uncrewed probes on the moon, a place US astronauts last visited in 1972. “Last December, China became the first nation to land on the far side of the moon and revealed their ambition to seize the lunar strategic high ground and become the world’s pre-eminent spacefaring nation,” Pence said at a meeting of the National Space Council in March. Even more worrying, neither country seems interested in placing the issue on the diplomatic agenda to lower the tensions, some security advocates say. That is in contrast to the decades of space cooperation that have existed between the US and Russia. “One of my biggest concerns is that for all the talk about how horrible an armed conflict with China would be for everyone, all the current US policies and actions seem to be preparing for armed conflict instead of avoiding it,” said Brian Weeden, director of programme planning at the Secure World Foundation, which advocates for using space in a peaceful and sustainable way. “There is not a lot of dialogue between the US and China,” he said. But other space experts say China is a greater threat to the United States than most people realise – and even an “imminent threat”, according to independent analyst Namrata Goswami. “If anything, it [the threat from China] is underappreciated and underplayed in the US,” she said. “I suspect that is because the US military might not want to call attention to its own vulnerabilities regarding its space assets.” Qiao said China was not seeking a space war but was preparing to counter any nation, including the US, that sought to pose a threat to its national security. China’s economic prowess left it well positioned to prevail in an expensive contest with the US, he said. “When the United States and the Soviet Union engaged in the cold war and the arms race, the United States was the largest manufacturing country, and the Soviet Union was not even the second,” he said. “But today it is China who is the world’s top manufacturer.” Recent reports from US spy agencies and think tanks indicate that China’s efforts are advancing quickly. Those include estimates that China will soon be able to field high-powered lasers designed to attack objects in low-Earth orbit – and evidence that its weapons can already attack targets much further from the Earth than the United States can. China’s reliance on space assets is also expanding: it has more than 120 intelligence, surveillance and reconnaissance satellites of its own – second only to the United States. About half of them are owned and operated by the military and could be used to track and target US forces around the world, the report warns. The threat getting the most attention is the danger China’s orbiting weapons might pose to the satellites the United States relies on for communications, navigation and surveillance – for both military operations and economic well-being. China is heavily investing in so-called counterspace technology, including the development of at least three antisatellite missile systems, according to an April report from the Centre for Strategic and International Studies. It is also developing satellites that can make physical contact with other satellites in orbit, the report said. While that technology can be used for repairs in orbit, it can also be used to disable a satellite or tear off a solar array to impact a satellite’s power source. The Pentagon’s “China Military Power” report found that China is also pursuing new jamming and “directed energy” weapons that can interfere with satellites. In a conflict, that technology would probably be used to “blind and deafen the enemy”, the report said. China also reorganised the PLA in 2015 to create a Strategic Support Force, a military branch dedicated entirely to space, electronic and cyberwarfare. The new branch was designed to bring space assets from across the military under one organisation, similar to the goal of the US Space Force. The space-centric branch, which reports directly to the Central Military Commission, is focused primarily on satellite launches and intelligence, navigation and communication operations, but also conducts research and development on new counterspace capabilities, according to the US Defence Intelligence Agency report published in February. Chinese military units are also training with missiles that could damage or destroy satellites, the agency also reported in February, adding that China will probably have a ground-based laser that can blind optical sensors on satellites in low-Earth orbit by 2020. Unlike the United States or Russia, China is also believed to have the capacity to use missiles to attack satellites in the more distant geosynchronous orbit, or 35,000km (22,000 miles) above Earth. If any country were to launch a physical strike in geosynchronous orbit (GEO), the debris field would make the area, which is today used for critical missions like early missile warning and weather observations, unusable. “We have much more to lose in GEO than any other country,” said Kaitlyn Johnson, an associate fellow who specialises in space security at the Centre for Strategic and International Studies. “We wouldn’t want to have a first strike capability.” Military experts also worry that China could try to seize areas of the moon that contain strategic resources including ice that could be used for rocket fuel or life support. But they say it is much more likely China will want to use dominance in space to influence conflicts on Earth. For instance, being able to threaten the military’s GPS or communications satellites might deter the US from getting involved in a conflict in the South China Sea, Weeden said. The US Space Force is intended to close some of those gaps by grouping space assets together to build expertise and giving the new service autonomy over its budget requests. One of the biggest goals of the new branch is to speed up space acquisitions, allowing new technology to be fielded faster, and to develop a space “doctrine” that would oversee how the US fights conflicts when space platforms are at stake. The Chinese government insists that it is merely responding to aggressive US moves to dominate space militarily. Qiao called it “bullying and hegemonic” for the United States to insist that other countries cannot follow suit. “The US space troops have long existed,” he said. “They just did not become an independent force … moreover, the US possessed anti-satellite capabilities as early as the 1970s and 1980s. China only developed anti-satellite capabilities at the end of the 1990s and even in the first decade of this century.” China had little choice but to enhance its capabilities, he said. “China’s purpose to develop space capabilities, firstly, is we do not want to be blackmailed by others,” Qiao said in the interview. “Second, we hope to use space peacefully. But if others want to oppress us by occupying the heights of space and opening up a ‘fourth battlefield’, China will certainly not accept it.” Still, China remained far from surpassing US dominance, he said. “We cannot overtake the US in the next decade or two, but we will narrow the gap in a comprehensive way. And it is possible we may take the lead in some individual areas.” Weeden agreed. “China is developing many of the same space capabilities the US did decades ago, while the US is focused on sustaining its capabilities and making them more resilient,” he said. “On the whole, the US is still far more capable than China is but the relative advantage is narrowing.”

#### US deterrence is critical in the SCS – Beijing's revanchism ensures lash-out in the next decade to preserve legitimacy, escalating to global conflict

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What Will Drive China to War? A cold war is already under way. The question is whether Washington can deter Beijing from initiating a hot one. President xi jinping declared in July that those who get in the way of China’s ascent will have their “heads bashed bloody against a Great Wall of steel.” The People’s Liberation Army Navy is churning out ships at a rate not seen since World War II, as Beijing issues threats against Taiwan and other neighbors. Top Pentagon officials have warned that China could start a military conflict in the Taiwan Strait or other geopolitical hot spots sometime this decade. Analysts and officials in Washington are fretting over worsening tensions between the United States and China and the risks to the world of two superpowers once again clashing rather than cooperating. President Joe Biden has said that America “is not seeking a new cold war.” But that is the wrong way to look at U.S.-China relations. A cold war with Beijing is already under way. The right question, instead, is whether America can deter China from initiating a hot one. Beijing is a remarkably ambitious revanchist power, one determined to make China whole again by “reuniting” Taiwan with the mainland, turning the East and South China Seas into Chinese lakes, and grabbing regional primacy as a stepping-stone to global power. It is also increasingly encircled, and faces growing resistance on many fronts—just the sort of scenario that has led it to lash out in the past. The historical record since the founding of the People’s Republic of China in 1949 is clear: When confronted by a mounting threat to its geopolitical interests, Beijing does not wait to be attacked; it shoots first to gain the advantage of surprise. In conflicts including the Korean War and clashes with Vietnam in 1979, China has often viewed the use of force as an educational exercise. It is willing to pick even a very costly fight with a single enemy to teach it, and others observing from the sidelines, a lesson. Today, Beijing might be tempted to engage in this sort of aggression in multiple areas. And once the shooting starts, the pressures for escalation are likely to be severe. Numerous scholars have analyzed when and why Beijing uses force. Most reach a similar conclusion: China attacks not when it feels confident about the future but when it worries its enemies are closing in. As Thomas Christensen, the director of the China and the World Program at Columbia University, writes, the Chinese Communist Party wages war when it perceives an opening window of vulnerability regarding its territory and immediate periphery, or a closing window of opportunity to consolidate control over disputed areas. This pattern holds regardless of the strength of China’s opponent. In fact, Beijing often has attacked far superior foes—including the U.S.—to cut them down to size and beat them back from Chinese-claimed or otherwise sensitive territory. Examples of this are plentiful. In 1950, for instance, the fledgling PRC was less than a year old and destitute, after decades of civil war and Japanese brutality. Yet it nonetheless mauled advancing U.S. forces in Korea out of concern that the Americans would conquer North Korea and eventually use it as a base to attack China. In the expanded Korean War that resulted, China suffered almost 1 million casualties, risked nuclear retaliation, and was slammed with punishing economic sanctions that stayed in place for a generation. But to this day, Beijing celebrates the intervention as a glorious victory that warded off an existential threat to its homeland. In 1962, the PLA attacked Indian forces, ostensibly because they had built outposts in Chinese-claimed territory in the Himalayas. The deeper cause was that the CCP feared that it was being surrounded by the Indians, Americans, Soviets, and Chinese Nationalists, all of whom had increased their military presence near China in prior years. Later that decade, fearing that China was next on Moscow’s hit list as part of efforts to defeat “counterrevolution,” the Chinese military ambushed Soviet forces along the Ussuri River and set off a seven-month undeclared conflict that once again risked nuclear war. In the late ’70s, Beijing picked a fight with Vietnam. The purpose, remarked Deng Xiaoping, then the leader of the CCP, was to “teach Vietnam a lesson” after it started hosting Soviet forces on its territory and invaded Cambodia, one of China’s only allies. Deng feared that China was being surrounded and that its position would just get worse with time. And from the ’50s to the ’90s, China nearly started wars on three separate occasions by firing artillery or missiles at or near Taiwanese territory, in 1954–55, 1958, and 1995–96. In each case, the goal was—among other things—to deter Taiwan from forging a closer relationship with the U.S. or declaring its independence from China. To be clear, every decision for war is complex, and factors including domestic politics and the personality quirks of individual leaders have also figured in China’s choices to fight. Yet the overarching pattern of behavior is consistent: Beijing turns violent when confronted with the prospect of permanently losing control of territory. It tends to attack one enemy to scare off others. And it rarely gives advance warning or waits to absorb the initial blow. For the past few decades, this pattern of first strikes and surprise attacks has seemingly been on hold. Beijing’s military hasn’t fought a major war since 1979. It hasn’t shot at large numbers of foreigners since 1988, when Chinese frigates gunned down 64 Vietnamese sailors in a clash over the Spratly Islands. China’s leaders often claim that their country is a uniquely peaceful great power, and at first glance, the evidence backs them up. But the China of the past few decades was a historical aberration, able to amass influence and wrest concessions from rivals merely by flaunting its booming economy. With 1.3 billion people, sky-high growth rates, and an authoritarian government that courted big business, China was simply too good to pass up as a consumer market and a low-wage production platform. So country after country curried favor with Beijing. Britain handed back Hong Kong in 1997. Portugal gave up Macau in 1999. America fast-tracked China into major international institutions, such as the World Trade Organization. Half a dozen countries settled territorial disputes with China from 1991 to 2019, and more than 20 others cut diplomatic ties with Taiwan to secure relations with Beijing. China was advancing its interests without firing a shot and, as Deng remarked, “hiding its capabilities and biding its time.” Those days are over. China’s economy, the engine of the CCP’s international clout, is starting to sputter. From 2007 to 2019, growth rates fell by more than half, productivity declined by more than 10 percent, and overall debt surged eightfold. The coronavirus pandemic has dragged down growth even further and plunged Beijing’s finances deeper into the red. On top of all this, China’s population is aging at a devastating pace: From 2020 to 2035 alone, it will lose 70 million working-age adults and gain 130 million senior citizens. Countries have recently become less enthralled by China’s market and more worried about its coercive capabilities and aggressive actions. Fearful that Xi might attempt forced reunification, Taiwan is tightening its ties to the U.S. and revamping its defenses. For roughly a decade, Japan has been engaged in its largest military buildup since the Cold War; the ruling Liberal Democratic Party is now talking about doubling defense spending. India is massing forces near China’s borders and vital sea lanes. Vietnam and Indonesia are expanding their air, naval, and coast-guard forces. Australia is opening up its northern coast to U.S. forces and acquiring long-range missiles and nuclear-powered attack submarines. France, Germany, and the United Kingdom are sending warships into the Indo-Pacific region. Dozens of countries are looking to cut China out of their supply chains; anti-China coalitions, such as the Quad and AUKUS, are proliferating. Globally, opinion polls show that fear and mistrust of China has reached a post–Cold War high. All of which raises a troubling question: If Beijing sees that its possibilities for easy expansion are narrowing, might it begin resorting to more violent methods? China is already moving in that direction. It has been using its maritime militia (essentially a covert navy), coast guard, and other “gray zone” assets to coerce weaker rivals in the Western Pacific. Xi’s government provoked a bloody scrap with India along the disputed Sino-Indian frontier in 2020, reportedly out of fear that New Delhi was aligning more closely with Washington. Beijing certainly has the means to go much further. The CCP has spent $3 trillion over the past three decades building a military that is designed to defeat Chinese neighbors while blunting American power. It also has the motive: In addition to slowing growth and creeping encirclement, China faces closing windows of opportunity in its most important territorial disputes. China’s geopolitical aims are not a secret. Xi, like his predecessors, desires to make China the preponderant power in Asia and, eventually, the world. He wants to consolidate China’s control over important lands and waterways the country lost during the “century of humiliation” (1839–1949), when China was ripped apart by imperialist powers. These areas include Hong Kong, Taiwan, chunks of Indian-claimed territory, and some 80 percent of the East and South China Seas. The Western Pacific flash points are particularly vital. Taiwan is the site of a rival, democratic Chinese government in the heart of Asia with strong connections to Washington. Most of China’s trade passes through the East and South China Seas. And China’s primary antagonists in the area—Japan, Taiwan, the Philippines—are part of a strategic chain of U.S. allies and partners whose territory blocks Beijing’s access to the Pacific’s deep waters. The CCP has staked its legitimacy on reabsorbing these areas and has cultivated an intense, revanchist form of nationalism among the Chinese people. Schoolchildren study the century of humiliation. National holidays commemorate foreign theft of Chinese lands. For many citizens, making China whole again is as much an emotional as a strategic imperative. Compromise is out of the question. “We cannot lose even one inch of the territory left behind by our ancestors,” Xi told James Mattis, then the U.S. secretary of defense, in 2018. Taiwan is the place where China’s time pressures are most severe. Peaceful reunification has become extremely unlikely: In August 2021, a record 68 percent of the Taiwanese public identified solely as Taiwanese and not as Chinese, and more than 95 percent wanted to maintain the island’s de facto sovereignty or declare independence. China retains viable military options because its missiles could incapacitate Taiwan’s air force and U.S. bases on Okinawa in a surprise attack, paving the way for a successful invasion. But Taiwan and the U.S. now recognize the threat. President Biden recently stated that America would fight to defend Taiwan from an unprovoked Chinese attack. Washington is planning to harden, disperse, and expand its forces in the Asia-Pacific by the early 2030s. Taiwan is pursuing, on a similar timeline, a defense strategy that would use cheap, plentiful capabilities such as anti-ship missiles and mobile air defenses to make the island an incredibly hard nut to crack. This means that China will have its best chance from now to the end of the decade. Indeed, the military balance will temporarily shift further in Beijing’s favor in the late 2020s, when many aging U.S. ships, submarines, and planes will have to be retired. This is when America will be in danger, as the former Pentagon official David Ochmanek has remarked, of getting “its ass handed to it” in a high-intensity conflict. If China does attack, Washington could face a choice between escalation or seeing Taiwan conquered. More such dilemmas are emerging in the East China Sea. China has spent years building an armada, and the balance of naval tonnage currently favors Beijing. It regularly sends well-armed coast-guard vessels into the waters surrounding the disputed Senkaku Islands to weaken Japan’s control there. But Tokyo has plans to regain the strategic advantage by turning amphibious ships into aircraft carriers for stealth fighters armed with long-range anti-ship missiles. It is also using geography to its advantage by stringing missile launchers and submarines along the Ryukyu Islands, which stretch the length of the East China Sea. Meanwhile, the U.S.-Japan alliance, once a barrier to Japanese remilitarization, is becoming a force multiplier. Tokyo has reinterpreted its constitution to fight more actively alongside the U.S. Japanese forces regularly operate with American naval vessels and aircraft; American F-35 fighters fly off of Japanese ships; U.S. and Japanese officials now confer routinely on how they would respond to Chinese aggression—and publicly advertise that cooperation. For years, Chinese strategists have speculated about a short, sharp war that would humiliate Japan, rupture its alliance with Washington, and serve as an object lesson for other countries in the region. Beijing could, for instance, land or parachute special forces on the Senkakus, proclaim a large maritime exclusion zone in the area, and back up that declaration by deploying ships, submarines, warplanes, and drones—all supported by hundreds of conventionally armed ballistic missiles aimed at Japanese forces and even targets in Japan. Tokyo then would either have to accept China’s fait accompli or launch a difficult and bloody military operation to recapture the islands. America, too, would have to choose between retreat and honoring the pledges it made—in 2014 and in 2021—to help Japan defend the Senkakus. Retreat might destroy the credibility of the U.S.-Japan alliance. Resistance, war games held by prominent think tanks suggest, could easily lead to rapid escalation resulting in a major regional war. What about the South China Sea? Here, China has grown accustomed to shoving around weak neighbors. Yet opposition is growing. Vietnam is stocking up on mobile missiles, submarines, fighter jets, and naval vessels that can make operations within 200 miles of its coast very difficult for Chinese forces. Indonesia is ramping up defense spending—a 20 percent hike in 2020 and another 16 percent in 2021—to buy dozens of fighters, surface ships, and submarines armed with lethal anti-ship missiles. Even the Philippines, which courted Beijing for most of President Rodrigo Duterte’s term, has been increasing air and naval patrols, conducting military exercises with the U.S., and planning to purchase cruise missiles from India. At the same time, a formidable coalition of external powers—the U.S., Japan, India, Australia, Britain, France, and Germany—are conducting freedom-of-navigation exercises to contest China’s claims. From Beijing’s perspective, circumstances are looking ripe for a teachable moment. The best target might be the Philippines. In 2016, Manila challenged China’s claims to the South China Sea before the Permanent Court of Arbitration and won. Beijing might relish the opportunity to reassert its claims—and warn other Southeast Asian countries about the cost of angering China—by ejecting Filipino forces from their isolated, indefensible South China Sea outposts. Here again, Washington would have few good options: It could stand down, effectively allowing China to impose its will on the South China Sea and the countries around it, or it could risk a much bigger war to defend its ally. Get ready for the “terrible 2020s”: a period in which China has strong incentives to grab “lost” land and break up coalitions seeking to check its advance. Beijing possesses grandiose territorial aims as well as a strategic culture that emphasizes hitting first and hitting hard when it perceives gathering dangers. It has a host of wasting assets in the form of military advantages that may not endure beyond this decade. Such dynamics have driven China to war in the past and could do so again today. If conflict does break out, U.S. officials should not be sanguine about how it would end. Tamping or reversing Chinese aggression in the Western Pacific could require a massive use of force. An authoritarian CCP, always mindful of its precarious domestic legitimacy, would not want to concede defeat even if it failed to achieve its initial objectives. And historically, modern wars between great powers have more typically gone long than stayed short. All of this implies that a U.S.-China war could be incredibly dangerous, offering few plausible off-ramps and severe pressures for escalation. The U.S. and its friends can take steps to deter the PRC, such as drastically speeding the acquisition of weaponry and prepositioning military assets in the Taiwan Strait and East and South China Seas, among other efforts, to showcase its hard power and ensure that China can’t easily knock out U.S. combat power in a surprise attack. At the same time, calmly firming up multilateral plans, involving Japan, Australia, and potentially India and Britain, for responding to Chinese aggression could make Beijing realize how costly such aggression might be. If Beijing understands that it cannot easily or cheaply win a conflict, it may be more cautious about starting one. Most of these steps are not technologically difficult: They exploit capabilities that are available today. Yet they require an intellectual shift—a realization that the United States and its allies need to rapidly shut China’s windows of military opportunity, which means preparing for a war that could well start in 2025 rather than in 2035. And that, in turn, requires a degree of political will and urgency that has so far been lacking. China’s historical warning signs are already flashing red. Indeed, taking the long view of why and under which circumstances China fights is the key to understanding just how short time has become for America and the other countries in Beijing’s path.

#### Chinese tech advancements embolden China and escalate to nuclear confrontation

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Novel Applications How will states use such a newfound advantage? Technology rarely fundamentally changes the nature or objectives of states. More often, states use technology to advance preexisting geopolitical aims. Moreover, enhanced power can result in greater ambition. Given the geopolitical landscape described, it is likely the United States and its Allies and partners at the core of the international system will behave differently with new military technologies than will revisionist powers, such as Russia and China. The spread of new technology to the United States and its Allies and partners would likely serve, on balance, to reinforce the existing sources of stability in the prevailing international system. At the end of the Cold War, the United States and its Allies and partners achieved a technologicalmilitary advantage over its great power rivals, with the US using its unipolar position to deepen and expand a rules-based system. They also employed their military dominance to counter perceived threats from rogue states and terrorist networks. The United States, its Allies, and partners did not, however, engage in military aggression against great power, nuclear-armed rivals or their allies. In the future, these status quo powers are apt to use military advantages to reinforce their position in the international system and to deter attacks against Allies and partners in Europe and the Indo-Pacific. These states might also employ military power to deal with threats posed by terrorist networks or by regional revisionist powers such as Iran and North Korea. But it is extremely difficult to imagine scenarios in which Washington or its Allies or partners would use newfound military advantages provided by emerging technology to conduct an armed attack against Russia or China. Similarly, Moscow and Beijing would likely use any newfound military strength to advance their preexisting geopolitical aims. Given their very different positions in the international system, however, these states are likely to employ new military technologies in ways that are destabilizing. These states have made clear their dissatisfaction with the existing international system and their desire to revise it. Both countries have ongoing border disputes with multiple neighboring countries. If Moscow developed new military technologies and operational concepts that shifted the balance of power in its favor, it would likely use this advantage to pursue revisionist aims. If Moscow acquired a newfound ability to more easily invade and occupy territory in Eastern Europe, for example (or if Putin believed Russia had such a capability), it is more likely Russia would be tempted to engage in aggression. Likewise, if China acquired an enhanced ability through new technology to invade and occupy Taiwan or contested islands in the East or South China Seas, Beijing’s leaders might also find this opportunity tempting. If new technology enhances either power’s anti-access, area-denial network, then its leaders may be more confident in their ability to achieve a fait accompli attack against a neighbor and then block a US-led liberation. These are precisely the types of shifts in the balance of power that can lead to war. As mentioned previously, the predominant scholarly theory on the causes of war—the bargaining model—maintains that imperfect information on the balance of power and the balance of resolve and credible commitment problems result in international conflict.52 New technology can exacerbate these causal mechanisms by increasing uncertainty about, or causing rapid shifts in, the balance of power. Indeed as noted above, new military technology and the development of new operational concepts have shifted the balance of power and resulted in military conflict throughout history. Some may argue emerging military technology is more likely to result in a new tech arms race than in conflict. This is possible. But Moscow and Beijing may come to believe (correctly or not) that new technology provides them a usable military advantage over the United States and its Allies and partners. In so doing, they may underestimate Washington. If Moscow or Beijing attacked a vulnerable US Ally or partner in their near abroad, therefore, there would be a risk of major war with the potential for nuclear escalation. The United States has formal treaty commitments with several frontline states as well as an ambiguous defense obligation to Taiwan. If Russia or China were to attack these states, it is likely, or at least possible, that the United States would come to the defense of the victims. While many question the wisdom or credibility of America’s global commitments, it would be difficult for the United States to simply back down. Abandoning a treaty ally could cause fears that America’s global commitments would unravel. Any US president, therefore, would feel great pressure to come to an Ally’s defense and expel Russian or Chinese forces. Once the United States and Russia or China are at war, there would be a risk of nuclear escalation. As noted previously, experts assess the greatest risk of nuclear war today does not come from a bolt-out-of-the-blue strike but from nuclear escalation in a regional, conventional conflict.53 Russian leaders may believe it is in their interest to use nuclear weapons early in a conflict with the United States and NATO.54 Russia possesses a large and diverse arsenal, including thousands of nonstrategic nuclear weapons, to support this nuclear strategy. In the 2018 Nuclear Posture Review, Washington indicates it could retaliate against any Russian nuclear “de-escalation” strikes with limited nuclear strikes of its own using low-yield nuclear weapons.55 The purpose of US strategy is to deter Russian strikes. If deterrence fails, however, there is a clear pathway to nuclear war between the United States and Russia. As Henry Kissinger pointed out decades ago, there is no guarantee that, once begun, a limited nuclear war stays limited.56 There are similar risks of nuclear escalation in the event of a US-China conflict. China has traditionally possessed a relaxed nuclear posture with a small “lean and effective” deterrent and a formal “no first use” policy. But China is relying more on its strategic forces. It is projected to double—if not triple or quadruple—the size of its nuclear arsenal in the coming decade.57 Chinese experts have acknowledged there is a narrow range of contingencies in which China might use nuclear weapons first.58 As in the case of Russia, the US Nuclear Posture Review recognizes the possibility of limited Chinese nuclear attacks and also holds out the potential of a limited US reprisal with low-yield nuclear weapons as a deterrent.59 If the nuclear threshold is breached in a conflict between the United States and China, the risk of nuclear exchange is real. In short, if a coming revolution in military affairs provides a real or perceived battlefield advantage for Russia or China, such a development raises the likelihood of armed aggression against US regional allies, major power war, and an increased risk of nuclear escalation.

#### That causes nuclear winter

**Wittner 12** — Dr. Lawrence Wittner (Professor of History emeritus at SUNY/Albany), 1-30-2012, “Is a Nuclear War With China Possible?” https://www.huffpost.com/entry/nuclear-war-china\_b\_1116556)

Not necessarily. And yet, there are signs that it could. After all, both the United States and China possess large numbers of nuclear weapons. The U.S. government threatened to attack China with nuclear weapons during the Korean War and, later, during their conflict over the future of China’s offshore islands, Quemoy and Matsu. In the midst of the latter confrontation, President Dwight Eisenhower declared publicly, and chillingly, that U.S. nuclear weapons would “be used just exactly as you would use a bullet or anything else.” Of course, China didn’t have nuclear weapons then. Now that it does, perhaps the behavior of national leaders will be more temperate. But the loose nuclear threats of U.S. and Soviet government officials during the Cold War, when both nations had vast nuclear arsenals, should convince us that, even as the military ante is raised, nuclear saber-rattling persists. Some pundits argue that nuclear weapons prevent wars between nuclear-armed nations; and, admittedly, there haven’t been very many — at least not yet. But the Kargil War of 1999, between nuclear-armed India and nuclear-armed Pakistan, should convince us that such wars can occur. Indeed, in that case, the conflict almost slipped into a nuclear war. Pakistan’s foreign secretary threatened that, if the war escalated, his country felt free to use “any weapon” in its arsenal. During the conflict, Pakistan did move nuclear weapons toward its border, while India, it is claimed, readied its own nuclear missiles for an attack on Pakistan. At the least, though, don’t nuclear weapons deter a nuclear attack? Do they? Obviously, NATO leaders didn’t feel deterred, for, throughout the Cold War, NATO’s strategy was to respond to a Soviet conventional military attack on Western Europe by launching a Western nuclear attack on the nuclear-armed Soviet Union. Furthermore, if U.S. government officials really believed that nuclear deterrence worked, they would not have resorted to championing “Star Wars” and its modern variant, national missile defense. Why are these vastly expensive — and probably unworkable — military defense systems needed if other nuclear powers are deterred from attacking by U.S. nuclear might? Of course, the bottom line for those Americans convinced that nuclear weapons safeguard them from a Chinese nuclear attack might be that the U.S. nuclear arsenal is far greater than its Chinese counterpart. Today, it is estimated that the U.S. government [possesses](http://www.telegraph.co.uk/news/worldnews/northamerica/usa/7674962/US-has-more-than-5000-nuclear-warheads.html) over 5,000 nuclear warheads, while the Chinese government has a total inventory of [roughly 300](http://www.nukestrat.com/china/Book-35-125.pdf). Moreover, only about 40 of these Chinese nuclear weapons [can reach](http://csis.org/blog/start-and-china-really) the United States. Surely the United States would “win” any nuclear war with China. But what would that “victory” entail? An attack with these Chinese nuclear weapons would immediately slaughter at least 10 million Americans in a great storm of blast and fire, while leaving many more dying horribly of sickness and radiation poisoning. The Chinese death toll in a nuclear war would be far higher. Both nations would be reduced to smoldering, radioactive wastelands. Also, radioactive debris sent aloft by the nuclear explosions would blot out the sun and bring on a “nuclear winter” around the globe — destroying agriculture, creating worldwide famine, and generating chaos and destruction. Moreover, in another decade the extent of this catastrophe would be far worse. The Chinese government is currently expanding its nuclear arsenal, and by the year 2020 it is [expected](http://www.nukestrat.com/china/Book-35-125.pdf) to more than double its number of nuclear weapons that can hit the United States. The U.S. government, in turn, has [plans](http://www.guardian.co.uk/world/2011/oct/30/nuclear-powers-weapons-spending-report) to spend hundreds of billions of dollars “modernizing” its nuclear weapons and nuclear production facilities over the next decade.

### advantage 3 is SPACE WAR!

#### scenario 1 is venus civil war

#### Space colonization causes existential wars – secessionist movements, reactionist colonies, and inter-colonial conflict outweigh every terrestrial war in history.

Kovic ’21 [Marko; February 2021; independent researcher and PhD at Institute of Mass Communication and Media Research, University of Zurich; Futures, “Risks of space colonization,” vol. 126; kp]

5 Conflict risks

Conflict risks are risks that are created by the prospect of hostile actors or powers in the context of space colonization. Conflict risks are in principle not unlike conflicts that humankind has experienced throughout its Earth-based history, but they are much greater in scope and severity. The four conflict risks I focus on are depicted in Figure 5.

Figure 5: Conflict risks of space colonization.

I identify two catastrophic and two existential conflict risks.

5.1 Secession and independence conflicts

Human habitats beyond Earth are likely to remain modest in the near- term future. The International Space Station, humankind’s most advanced habitat-like project so far, can accommodate six people and is dependent on supplies from Earth. More ambitious colonization projects such as SpaceX’s plan for Mars colonies typically envision what amounts to very small and simple camps [39]. Managing such simple colonization projects should be doable legally and politically. With more mature colonies, however, the pic- ture changes.

Imagine, for example, the large, self-sustaining habitat on Venus that consists of 2 billion people that I mentioned in a thought experiment before. That hypothetical habitat is truly self-sustainable, in the sense that survival on Venus is not contingent in any way on resources or other kinds of support from Earth. If prior human history is an indication, it is conceivable that the Venusians could at some point seek to change their political status. They might want to no longer be governed by Earth or Earth-based governements and instead have sovereignty to autonomously and freely shape Venus’ future. They might, in other words, seek to seceede and become an independent political entity.

Given prior human history of secession and independence movements, such a claim to independence in the context of space colonization could easily result in violent conflict, and given the scale of the conflict parties in this scenario, the bloodshed could be much greater than all the wars that happened in Earth’s history so far. Of course, we do not know what the dominant political philosophy of the future will be. Perhaps popular sovereignty and the wish for autonomy will be fully respected and met with unconditional, enlightened understanding. But that prospect is, at best, uncertain, and the prospect of catastrophic violent conflicts seems at least possible.

5.2 Reactionary colonies

Let us assume for the sake of argument that the risks surrounding secession- ist claims of extraterrestrial colonies will eventually have been overcome and that there are colonies which have attained a country-like or world-like status. What should the political systems in and the moral foundations of those independent colonies look like? Ideally, they would be at least as democratic, liberal, and generally morally progressive as the most democratic, liberal, and morally progressive countries today. More specifically, independent fu- ture colonies should have socio-political systems that do not lower average wellbeing or create (disproportionately) more suffering compared to their pre-existing peers such as Earth-based countries (Or whatever the dominant polity on Earth in that future might be.). However, there is no guarantee that independent colonies will meet that socio-political and moral bar. It is possible that there will be colonies whose socio-political systems are regressive in one way or another, marked by a relative moral decay compared to the baseline of political systems and moral frameworks. I call such potential undesirable entities reactionary colonies.

The emergence of reactionary colonies might seem implausible given that humankind has, very roughly speaking, so far morally improved over the course of its history8. But reactionary colonies might actually be a fairly common future development. If humankind at some point achieves the tech- nological means for creating colonies with relative ease, creating new colonies might be an attractive option for extremist groups and beliefs. Imagine, for example, a religious group that believes in the fundamental superiority of men over women. Such a religious group might find it difficult adhering to their flawed moral principles in a pluralistic society. Opting for colonial exodus might represent an attractive opportunity for that religious group to build a society from scratch which is based on their notions of female inferiority and subjugation.

The specific risk posed by reactionary colonies ist twofold. Reactionary colonies would by definition lower the average happiness and wellbeing of humankind and create unnecessary, preventable suffering. Reactionary colonies would also represent potential rogue actors that could greatly amplify the aberration risks described in section 4. For example, a dictatorial regime that causes great suffering to its population might be tempted to expand its dictatorial ideology to other colonies. Or that dictatorial colony could be led by a psychopathic elite that enjoys letting sentient simulations suffer as much as possible. The potential catastrophic and even existential multiplicator effects of reactionary colonies are, unfortunately, numerous.

5.3 Inter-colonial conflict

Let us, again for the sake of the argument, assume that the previous problem of reactionary colonies has somehow been solved or avoided. Humankind has continued its path of technological development, and it has established several large clusters of colonies beyond the Solar system. Assuming that the fundamental problem of faster-than-light communication has not been solved yet, communication between the clusters lags months or even years, and physical contact between the clusters is rare since travel takes even longer than communication.

The inevitable consequence of such a splintering of human civilization is that the different clusters of colonies would over time develop distinct cultures, and with only scarce and delayed contact with other clusters, a form of intergroup bias [40], the moral preference of one’s own in-group over the out-group, would likely start to manifest. Over time, that us-versus- them heuristic could help create distinct and solidified social identities within the colony clusters [41], and the beliefs and preferences about the outgroup colonies could become more overtly negative. Given enough time and great enough idiosyncratic development within each colony cluster, the cultural and moral connections between the colony clusters could further erode, and in their place, a sense of dread and looming danger about the others’ goals and preferences could take hold. Over a long enough period of time and great enough separation, the perception that other colonies are a threat could grow; so much so that taking preventative action and attacking and suppressing them might seem like the most rational

course of action [42]. Given the scale and the likely technological sophistication of future weapons systems, a violent conflict between advanced colonies and colony clusters would create suffering on an astronomical scale.

Of course, the prospect of inter-colonial conflict is somewhat speculative [43]. But given humankind’s past experiences, violent conflict clearly seems within the realm of the possible. That does not mean that such an almost immeasurably terrible conflict is unavoidable. Even the slightest probability of such conflict, however, means immense potential expected disvalue.

#### Outweighs on scope and magnitude – space weapons wipe out all life in the universe.

Torres ’18 [Phil; April 20; Affiliate Scholar at the Institute for Ethics and Emerging Technologies, and founder of the X-Risks Institute; Futures, “Space Colonization and Suffering Risks: Reassessing the ‘Maxipok Rule’,” vol. 100 p. 74-85; kp]

5.1 Weapons of Total Destruction (WTDs)

There are a variety of “kill mechanisms” that one civilization could use to obliterate another. In relatively close propinquity, chemical and biological weapons could offer a means of targeted violence, since the deleterious effects of such weapons might be limited to a particular species (Deudney forthcoming). For example, the toxicity of a chemical X might be low for a species A but lethal to a species B. This could enable A to use X on B without fear of X harming A—a concern that has dissuaded some terrorists from employing chemical weapons. The same goes for a pathogenic germ Y: since pathogens often only harm single species, biological weapons could be used without the perpetrators worrying about becoming sick. With respect to artificial intelligences, there could be viral malware that affects only certain types of software; in this case, such viruses could be transferred not at the velocity of a sneeze but at the speed of light, traversing astronomically large stretches of space to devastate colonies of artificial-substrate beings.

Another possibility involves weaponizing “minor planets” like asteroids. This hints at the deflection dilemma discussed by Sagan (1994), among others, whereby the very same technology that could deflect an asteroid away from Earth could also be used to redirect one toward it. The resultant “planetoid bombs” could be launched in the direction of target civilizations at extremely high velocities and inflict far greater destruction than all the nuclear arsenals on Earth combined (see Cole and Cox 1965; Deudney forthcoming). Even more, asteroids are extremely numerous in the solar system and have a wide range of sizes, with estimates of 1.1 to 1.9 million that have greater-than-1-kilometer diameters in the asteroid belt between Mars and Jupiter. (A 1- kilometer impactor striking Earth would likely annihilate humanity by causing an impact winter.)

Thus, asteroids constitute an abundant source of easily obtainable, civilization-ending weaponry—a particularly worrisome fact given that the technological capabilities to redirect aster- oids will likely emerge at an early stage in our diaspora “out of Earth,” as it were (see Deudney forthcoming).

Other futuristic space weapons include military drones that either initiate attacks or engage in clandestine surveillance of other civilizations. Such drones could hide themselves from counter-surveillance detectors by employing metamaterial invisibility cloaks and propagate themselves through the von Neumann process of self-replication, that is, by converting raw ma- terials into clones of themselves. There is also the possibility of using “heliobeams,” or “sun guns,” to destroy targets by concentrating large amounts of solar radiation via a concave mirror on a satellite. Even more catastrophic are direct-energy weapons (DEWs) like lasers and particle-beams that use highly focused energy to superheat their targets. In fact, the US government has already developed weapons of this sort—they are science fact rather than fiction—although fu- ture breakthroughs could enable them to become immensely more destructive. If this is the case, they will offer yet another mechanism for wreaking unprecedented harm (see Deudney forthcom- ing). Along these lines, Anders Sandberg (forthcoming) suggests that technologically advanced civilizations could potentially use gravitational waves to create black holes. Generating waves of sufficient intensity would be energetically inefficient, according to current physics, but they have the advantage that they can interact with dark matter objects, unlike electromagnetic-energy weapons.

Even more, the universe appears to be in a “metastable” energy state. This suggests that one could tip it into a more stable, lower-energy state, perhaps by concentrating huge quantities of energy in tiny regions of spacetime, as occurs in some high-powered physics experiments. In other words, a particle collider could be weaponized to intentionally nucleate a “vacuum bubble,” or sphere of “true vacuum” spreading in all directions at the speed of light and destroying everything with which it comes into contact. Who might weaponize a particle collider? First, there could be actors who use the threat of a vacuum bubble for blackmail purposes. Second, there could be madmen (like Hitler) who create a vacuum bubble to avoid defeat. That is to say, a predatory actor could hold the following preference ordering: (i) triumphant victory over, say, its Local Group, (ii) total annihilation of the universe, and (iii) defeat. Third, particle colliders would also be the ideal WTD for RNUs, since it would enable them to obliterate not only all extant life in the universe but the very potential for life to arise—and it would do this without inflicting any suffering whatsoever.xviii Another possibility is that Tuckerian actors create a vac- uum bubble for the purely defensive reason of eliminating all potential attackers in the universe. As Sandberg (2017) speculates, it might be possible for “certain configurations of matter, energy, black holes, etc. [to] induce a post-transition structure that can act as an assembler.” This “as- sembler” would enable “some information [to] be transmitted into the new state,” thus making it possible for a civilization to “survive,” in some sense, the universe settling into a lower-energy configuration. On the other side of this transition, the “structure” can recrudesce into a daughter new civilization with the certitude that it is completely alone and, therefore, safe.

Finally, it is crucial to note that future beings—some of whom may have hugely augmented cognitive capacities—will almost certainly invent new weapons that are more powerful and effective than anything we could imagine. Such weapons could enable civilizations—or per- haps lone wolves, of which there could be, once again, trillions and trillions and trillions—to cause unprecedented injury to other civilizations. Consider the following passage from Bostrom (2013):

One can readily imagine a class of existential-catastrophe scenarios in which some tech- nology is discovered that puts immense destructive power into the hands of a large num- ber of individuals. If there is no effective defense against this destructive power, and no way to prevent individuals from having access to it, then civilization cannot last, since in a sufficiently large population there are bound to be some individuals who will use any destructive power available to them.

Scale this up from the individual level to the cosmopolitical level and the same conclusion fol- lows: Life in the universe cannot last.

#### scenario 2 is microbes!

#### Space colonization destroys microbial life – that outweighs.

Kovic ’21 [Marko; February 2021; independent researcher and PhD at Institute of Mass Communication and Media Research, University of Zurich; Futures, “Risks of space colonization,” vol. 126; kp]

4.2 Eliminating future extraterrestrial value

The discussion so far has mostly centered around the moral value of humankind. But in the context of space colonization, the moral reference group is not just humankind. Given the vastness of our galaxy alone, let alone the entire observable universe, the risks of space colonization for beings other than humankind need to be also taken into consideration. This starts with microbial life: Endangering primitive extraterrestrial life through space colonization could destroy immense future moral value.

We do not currently know whether life exists (or has ever existed) beyond Earth. But there is some plausibility to the assumption that the development of life is not a once-in-a-universe event. The conditions that presumably gave rise to life on Earth are almost certainly abundant throughout our galaxy, which means that, statistically speaking, primitive microbial life could come into existence relatively often [32]. If humans engage in space colonization, and if humans come into contact with extraterrestrial life, the extraterrestrial life in question will most likely be microbial in nature. What moral obligations do future human colonizers have towards microbial extraterrestrial life? To make this question more concrete, imagine a colonization scenario in the near future: Humans decide to terraform Mars in order to make it habitable for humans, but doing so would kill all existing species of Martian microbes that were discovered not long before the decision to terraform Mars. Would terraforming Mars be morally acceptable?

Microbial life on Earth is non-sentient, and the microbial life on Mars would also, in all likelihood, be non-sentient. If the Martian microbes neither feel anything like happiness nor experience anything like suffering, there are no utilitarian considerations of wellbeing or happiness to be made — humans could neither affect their level of wellbeing nor could they rob them of their capacity for happiness since microbial life forms lack both. However, there is a counterargument to this position: The Martian microbes have the potential to evolve into more complex, sentient and possibly even intelligent life forms. Eradicating them would therefore represent an existential damage, because all the potential future moral value would be lost. If this argument seems abstract, consider the scenario if the microbial life in question was Earth-based: If some extraterrestrial intelligence had eradicated our primitive microbial ancestors, humankind (as well as all other sentient Earth-based life) would never have come to be.

A second moral argument in favor of preserving the Martian microbes in our scenario is the argument of intrinsic value [33]. According to this position, the moral obligation towards extraterrestrial microbial life is not contingent on its sentience, but on its mere existence: Life in and of itself has a moral value, and by virtue of existing, our Martian microbes have a kind of right to their existence. In addition, and perhaps crucially, we have an obligation to respect that right. This deontological, Kantian view is not concerned with wellbeing and suffering, but instead with rights of and duties towards life. I find the utilitarian view of potential future moral value more useful than the intrinsic value argument, but it is worth mentioning the latter for the sake of completenes.

In any case, both moral arguments, the utilitarian view of potential future moral value as well as the deontological intrinsic value argument, suggest that endangering microbial life could be devastatingly wrong. A logical consequence of such considerations would be to adopt a strongly conservationist stance whereby humans refrain from colonizing a potentially large number of viable celestial bodies lest they threaten the microbes that have evolved there [34]. Such an approach could limit human expansion to entirely artifi- cial habitats and to biologically completely barren moons and planets.

#### scenario 3 is s-risks

#### Multiplies S-risks – humanity draws scars around the stars!

Kovic ’21 [Marko; February 2021; independent researcher and PhD at Institute of Mass Communication and Media Research, University of Zurich; Futures, “Risks of space colonization,” vol. 126; kp]

4.3 Astronomical suffering

Space colonization means that humans and human actions will spread beyond Earth and possibly cover, relatively speaking, vast areas of the reachable universe. This will potentially create immense positive value, but it also makes possible a form of existential risks that are astronomical in scope and hellish in severity — that are, in other words, orders of magnitude worse than anything humankind has caused or encountered so far. This subset of extreme existential risks is referred to as suffering risks [35].

Suffering risks are risks that are far worse than humankind going extinct or entering permanent moral stagnation because they mean that the suffering that is created through these risks is far greater than all suffering that has existed on Earth so far. There are different vectors of potential astronomical suffering. For example, it is conceivable that future human generations will spread wildlife throughout the colonized space, either inadvertently or actively. Wild animals on Earth generally lead short, miserable lives full of sometimes the most brutal suffering [36]. In in the history of Earth, wildlife suffering has not really improved at all, so astronomical wildlife suffering would likely represent a constant source of disvalue.

Another vector for suffering risks are sentient simulations. Given growing computational power, it is conceivable that we will eventually be able to simulate sentience, and as soon as simulated sentience is possible, simulated suffering will be as well. This technological path is not necessarily depen- dent on space colonization, but a colonizing humankind might have greater capabilities for running such simulations, for example by tapping into the power of stars in different Solar systems. Instances of simulated suffering could create more suffering than has ever occurred in the biological universe, within fractions of a second.

The risk of astronomical suffering is more uncertain than other existential risks, but it is at the same time more severe. At stake is not just humankind’s total potential positive future moral value, but disvalue that is decoupled from humankind and is potentially many orders of magnitude greater than all the happiness and wellbeing that could be created by human colonization of space.

#### S-risks outweigh extinction.

Daniel ‘17 [Max Daniel, Executive Director of the Foundational Research Institute, Senior Research Scholar at the Future of Humanity Institute, MS in Mathematics from Heidelberg University, “S-Risks: Why They Are The Worst Existential Risks, And How To Prevent Them”, Foundational Research Institute, https://foundational-research.org/s-risks-talk-eag-boston-2017/]

To come back to the title of my talk, I can now state why s-risks are the worst existential risks. S-risks are the worst existential risks because I’ll define them to have the largest possible scope and the largest possible severity. (I will qualify the claim that s-risks are the worst x-risks later.) That is, I’d like to suggest the following definition. “S-risk – One where an adverse outcome would bring about severe suffering on a cosmic scale, vastly exceeding all suffering that has existed on Earth so far.” So, s-risks are roughly as severe as factory farming, but with an even larger scope. To better understand this definition, let’s zoom in on the part of the map that shows existential risk. One subclass of risks are those that, with respect to their scope, would affect all future human generations, and, with respect to their severity, would remove everything valuable. One central example of such pan-generational, crushing risks are risks of human extinction. Risks of extinction have received the most attention so far. But, conceptually, x-risks contain another class of risks. These are risks of outcomes even worse than extinction in two respects. First, with respect to their scope, they not only threaten the future generations of humans or our successors, but all sentient life in the whole universe. Second, with respect to their severity, they not only remove everything that would be valuable but also come with a lot of disvalue – that is, features we’d like to avoid no matter what. Recall the story I told in the beginning, but think of Greta’s solitary confinement being multiplied by many orders of magnitude – for instance, because it affects a very large population of sentient uploads.

### theory

#### Condo’s bad – skews the 1ar making it impossible for us to read our best offense and lowers the threshold for argumentative introduction at no cost incentivizing ink chasing for clash – causes late breaking debates – reject the debater to remedy the damage – dispo solves their offense giving the aff choice

#### yes 1ar theory – otherwise no check on neg abuse – infinite time skew in ld means you err aff on the question to preserve fairness

## 1ar

### adv 1

#### Reject tech fetishism – the market prioritizes profits over sustainability and Jevon’s Paradox means even the most promising solutions fail.

Chertkovskaya ’21 [Ekaterina and Alexander Paulsson; PhD, Environmental and Energy Systems Studies, Lund Univesity; Senior Lecturer at Department of Business Administration in Lund University; Organization, “Countering corporate violence: Degrowth, ecosocialism and organising beyond the destructive forces of capitalism,” vol. 28 p. 405-425; kp]

Technology is often understood as both a productive and a progressive force that is no more than applied science, with technological discoveries presented as leading to, or being a precondition for, market expansion and economic growth (see e.g. Ark et al., 2013). This is, however, technology fetishism, which conceals the social and material embeddedness of technology into the capitalist mode of production (Harvey, 2003a; Hornborg, 2014). Technology is developed in the interest of capital and there is a tendency in capitalism ‘to choose those technologies that maximise the overall throughput of resources and energy in the interest of higher overall economic output’, which has a destructive side, too (Magdoff and Foster, 2011: 32–33). An awareness of this was articulated by Marx (1867/1996: 507–508): ‘[c]apitalist production, therefore, develops technology, and the combining together of various processes into a social whole, only by sapping the original sources of all wealth – the soil and the labourer’. Broadening this statement to our framework, his thesis can be expanded to depletion of nature more generally, which is what we focus on in this section.

Capitalism has been promoting technologies that have been simultaneously profitable and particularly destructive of the environment – ‘fossil fuel dependency, toxic synthetic chemicals (aris- ing in particular from petrochemical production), nuclear energy, large dams’, and, ‘[i]n its headlong rush to expand, capitalism systematically gives rise to technologies that produce waste in vast quantities – as long as the costs can be externalised on nature and society and not on corpora- tions themselves’ (Magdoff and Foster, 2011: 32; see also Barca, 2014). Thus, development of technology as a productive force under capitalism constitutes structural corporate violence to the environment, where effects of pollution and climate change are not immediately visible (Nixon, 2011). This violence intensifies when knowledge about the devastating environmental effects of technology becomes widely available, but business as usual continues. An illustrative example of this are the aggressive attempts by petrochemical companies to expand plastic production despite its fossil-dependency and very limited recyclability.

Technology fetishism is so strong, however, that the hypothesis that a breakthrough in more efficient technologies would allow economic growth to continue without environmental degradation is key to not only corporations, but global governance institutions and frameworks, such as Sustainable Development Goals, UNEP, OECD and the World Bank (Hickel and Kallis, 2019). This assumption is often also reproduced in contemporary Marxist accounts, due to the long-term reading of technol- ogy as a progressive force in itself in orthodox Marxism (Hornborg, 2014; Sayer, 1987).

Even the most promising technologies have limits. Renewable energy is dependent on mining of minerals, requires space, and its efficiency is incomparable with that of fossil-based power (Kallis, 2018). A lot of emphasis is put on efficiency improvements of technology, but there is long-standing empirical evidence – called Jevons Paradox – that they ultimately result in higher biophysical throughput due to increased production and consumption of more efficient products (Parrique et al., 2019). Furthermore, technologies where effects are uncertain and possibly hazardous, thus containing the potential for violence, are still widely proposed or used by different companies, including fracking, geoengineering and nuclear power. In particular, despite arguments of non-viability, bio-energy with carbon capture and storage is a technology for negative emissions that the most optimistic climate scenarios rely on (Hickel and Kallis, 2019). Widespread use of this technology, however, would require a lot of land and thus comes with risks of dispossession, and also risk of violence to humans and environments due to, for example, carbon leakages as a result of seismic activity (Muraca and Neuber, 2018). Corporate violence is thus not only in continuous use of destructive technologies, but also in promoting technology to address environmental problems whilst neglecting its limitations and sidelining the argument that an absolute reduction of material and energy throughput is necessary.

### adv 2

### T

#### w/m – debating as if implementation – ie., as if hypothetically all space colonization didn’t exist

#### w/m – plan text in a vacuum

#### c/i – the affirmative should defend the entirety of the resolution

#### Resolved means firm decision

Merriam-Webster’s 19 Online Dictionary, “resolved”, https://www.merriam-webster.com/dictionary/resolved

5 : to reach a firm decision about

resolve to get more sleep

resolve disputed points in a text

#### prefer it –

#### Words and phrases restrict to legislative action – just as bad – limits out courts aff etc and they have no reason why congress ground is specifically key!

#### They still get every link – all of the disads are a reason why the resolution isn’t good, the aff just defends the whole so it doesn’t matter

#### This is not policy debate!!!!!!!!!!!!

#### Their ev specifies congress on an obviously international topic ☹precision

#### Best for ground and fairness – our ev is in the context of general space colonization, just like everyone else's

#### Reasonability – good is good enough – competing interps is a race to the bottom and causes substance crowdout – they concede this in the nc when they don’t say competing interps good

### CP

#### Doesn’t solve cap – any expansion into space makes it worse because of its role as the new spatial fix

#### Theory isn't an rvi

#### Perm do both

#### Perm do the CP

#### Mining causes debris

* Any activity (landing, transport, mining) on asteroid surface causes hundreds of small particles
* Larger chunks can break into rubble and could increase risk to satellites by 30%

Sarah Scoles 15, “Dust from asteroid mining spells danger for satellites,” New Scientist, 5-27-2015, https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/

NASA chose the second option for its Asteroid Redirect Mission, which aims to pluck a boulder from an asteroid’s surface and relocate it to a stable orbit around the moon. But an asteroid’s gravity is so weak that it’s not hard for surface particles to escape into space. Now a new model warns that debris shed by such transplanted rocks could intrude where many defence and communication satellites live – in geosynchronous orbit. According to Casey Handmer of the California Institute of Technology in Pasadena and Javier Roa of the Technical University of Madrid in Spain, 5 per cent of the escaped debris will end up in regions traversed by satellites. Over 10 years, it would cross geosynchronous orbit 63 times on average. A satellite in the wrong spot at the wrong time will suffer a damaging high-speed collision with that dust. The study also looks at the “catastrophic disruption” of an asteroid 5 metres across or bigger. Its total break-up into a pile of rubble would increase the risk to satellites by more than 30 per cent (arxiv.org/abs/1505.03800). That may not have immediate consequences. But as Earth orbits get more crowded with spent rocket stages and satellites, we will have to worry about cascades of collisions like the one depicted in the movie Gravity. Handmer and Roa want to point out the problem now so that we can find a solution before any satellites get dinged. “It is possible to quantify and manage the risk,” says Handmer. “A few basic precautions will prevent harm due to stray asteroid material.”

#### Nuke war

* Troops movements, arms treaties, bomb tracking impossible to verify
* Heightened by economic disaster
* Debris could be misattributed as an attack causing second-strike

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

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