### OFF – Security

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### OFF – Security

#### This is the link. The attempt to “redefine” or broaden security beyond the military is the mechanism by which issues become depoliticized

Neocleous 2000 [Mark, Prof of the Critique of Political Economy at Brunel Univ, “Against Security,” *Radical Philosophy*, Mar/Apr, <https://www.radicalphilosophy.com/article/against-security>, GDI-MJS]

This widespread claim comes at a time when equally widespread demands have been made for an expansion of the concept ʻsecurityʼ. Within international relations, for example, long the disciplinary home of ʻsecurity studiesʼ, arguments for a ʻbroadʼ concept of security extending beyond the traditional sectors of state and military are now common. Buzan, Wæver and Wildeʼs ʻnew frameworkʼ for security analysis, for example, ʻattempts to widen the security agenda by claiming security status for issues and referent objects in the economic, environmental and societal sectors, as well as the military–political ones that deﬁne traditional security studiesʼ. Indeed, the question of how the concept of security can be expanded, broadened or deepened has been the central debate within international relations theory in the 1990s. [4] Inﬂuential political ﬁgures and institutions have also called for an expansion of the concept along similar lines. The Clinton administration in the early 1990s and Yeltsin in the late 1990s both called for ʻa new understanding of the meaning and nature of national securityʼ, while the 1994 United Nations Human Development Report encouraged ʻa new concept of human securityʼ much broader than the older, narrow, deﬁnition focused on military and territorial issues. The Report invites us to move ʻfrom nuclear security to human securityʼ, with the latter incorporating ʻuniversalʼ concerns within several broad categories: economic security, food security, health security, environmental security, personal security, community security and political security. Similarly, the 1995 Commission on Global Governance proposed to broaden security ʻfrom its traditional focus on the security of statesʼ to the ʻsecurity of people and the planetʼ, and in the same year the UN secretary-general, Boutros Boutros-Ghali, called for a ʻconceptual breakthroughʼ going ʻbeyond armed territorial securityʼ towards incorporating ʻthe security of people in their homes, jobs and communitiesʼ. Such arguments have dominated debates within the European Union during the same period. [5] In many ways such comments consolidate tendencies which ﬁrst emerged within the reports from international commissions in the 1980s, such as the Brandt Report (1980) on the wealth divide and the Brundtland Report (1987) on the environment. There had begun to develop what the Brandt Report describes as ʻa new, more comprehensive understanding of “security” which would be less restricted to the purely military aspectsʼ. [6] But they come at a time when insecurity is a central trope around which a whole host of social scientiﬁc researchers now base their work. One of the advantages said to follow from expanding the security concept – to the individual, for example – and incorporating within it more ʻhumanʼ concerns is that it helps focus on factors causing the generalized insecurity we now face. Claiming ʻsecurity statusʼ for an issue is said to render it somehow more important and the need to deal with it more urgent than simply designating it a problem. The general outcome is a demand for ʻmore securityʼ. One of Blairʼs leading wonks describes the key question in the ʻnew economyʼ as how to provide greater security; even more critical writers comment that ʻat the heart of social democracy is the one economic feature speciﬁcally and unashamedly ruled out by the resurgent free market: security. Social democracy offers nothing if it does not offer security.ʼ [7] And one can trace a clear line between the account of ontological security Giddens adapts from Husserl, Schutz, Goffman and Garﬁnkel and his presentation of the renewal of social democracy (the ʻthird wayʼ) as the basis of a new security. [8] It has even been suggested that the way to mobilize resources to deal with environmental degradation is to think of the environment not just as a security issue, but as the ultimate security issue. [9] My concern in this article is as follows. There is no doubt that the demand to ʻsecuritizeʼ issues such as poverty and the environment comes from a genuine desire to do something about them. Such appeals to ʻsecurityʼ might have an instinctive appeal for the Left generally, concerned as it must be with these same issues. Buying into the assumption that the best way to have something done about these issues is to code them as questions of (in)security would appear to render objections to it – arguments against security – completely out of place. In fact, as I shall argue, this is the very problem. A more critical interrogation of the concept of security reveals a deeply problematic core. In this article I therefore aim to show, ﬁrst, that ʻsecurityʼ is one of the essential categories in the self-understanding of bourgeois society; second, that the extensive ʻsecuritizingʼ of such a wide range of issues now taking place is in fact a mechanism by which they become depoliticized; third, that this is a dangerous political game to play; and fourth that, by implication at least, the concept of security therefore has little place in critical theory.

#### Surveillance obstacles disenfranchise minority communities as a basis of discrimination structuring modern day screening securitizing marginalized faciality with racialized surveillance algorithims

Hu 17 (Fordham Law Review Volume 86 | Issue 2 Article 13 2017 “Algorithmic Jim Crow” Margaret Hu Washington and Lee University School of Law, <https://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=5445&context=flr>)//Xain

Under historic Jim Crow, literacy tests, poll taxes, and other obstacles to voting rights were equally applied to all voters.72 Although these obstacles did not explicitly inquire into voters’ race, they nonetheless significantly disenfranchised minority communities. Therefore, they served discriminatory ends even though the race of the voter was never technically a basis for denying access to the ballot.73 Much like literacy tests and poll taxes, post-9/11 security initiatives may disproportionately impact minority communities even though they do not explicitly effectuate decisions based on protected attributes. An inquiry into modern-day screening and vetting systems depends upon in an understanding of myriad post-9/11 national security programs and policy initiatives. Contemporary screening and vetting systems utilize algorithms to determine a wide range of questions, including identity and associational assessments, to gauge risk. For example, extreme vetting systems like the one promulgated by the Executive Orders may bring about disproportionate burdens on minority communities. Potential discrimination facilitated or exacerbated by technological means appearing to be facially neutral may evade legal challenge requiring careful inquiry.

#### Theorizing of apocalyptic scenarios evades focus on the war on minorities

Omolade 18(Omolade, Barbara - Barbara Omolade is a Christian scholar specializing in African-American and women's issues (2018), We Speak for the Planet. 10.4324/9780429499142-96.)//Xain

Recent efforts by Soviet leader Mikhail Gorbachev and President Ronald Reagan to limit nuclear testing, stockpiling, and weaponry, while still protecting their own arsenals and selling arms to countries and factions around the world, vividly demonstrate how "peace" can become an abstract concept within a culture of war. Many peace activists are similarly blind to the constant wars and threats of war being waged against people of color and the planet by those who march for "peace" and by those they march against. These pacifists, like Gorbachev and Reagan, frequently want people of color to fear what they fear and define peace as they define it. They are unmindful that our lands and peoples have already been and are being destroyed as part of the "final solution" of the "color line." It is difficult to persuade the remnants of Native American tribes, the starving of African deserts, and the victims of the Cambodian "killing fields" that nuclear war is the major danger to human life on the planet and that only a nuclear "winter" embodies fear and futurelessness for humanity. The peace movement suffers greatly from its lack of a historical and holistic perspective, practice, and vision that include the voices and experiences of people of color; the movement's goals and messages have therefore been easily coopted and expropriated by world leaders who share the same culture of racial dominance and arrogance. The peace movement's racist blinders have divorced peace from freedom, from feminism, from education reform, from legal rights, from human rights, from international alliances and friendships, from national liberation, from the particular (for example, black female, Native American male) and the general (human being). Nevertheless, social movements such as the civil rights-black power movement in the United States have always demanded peace with justice, with liberation, and with social and economic reconstruction and cultural freedom at home and abroad. The integration of our past and our present holocausts and our struggle to define our own lives and have our basic needs met are at the core of the inseparable struggles for world peace and social betterment. The Achilles heel of the organized peace movement in this country has always been its whiteness. In this multi-racial and racist society, no allwhite movement can have the strength to bring about basic changes. It is axiomatic that basic changes do not occur in any society unless the people who are oppressed move to make them occur. In our society it is people of color who are the most oppressed. Indeed our entire history teaches us that when people of color have organized and struggled-most especially, because of their particular history, Black people-have moved in a more humane direction as a society, toward a better life for all people.1 Western man's whiteness, imagination, enlightened science, and movements toward peace have developed from a culture and history mobilized against women of color. The political advancements of white men have grown directly from the devastation and holocaust of people of color and our lands. This technological and material progress has been in direct proportion to the undevelopment of women of color. Yet the dayto- day survival, political struggles, and rising up of women of color, especially black women in the United States, reveal both complex resistance to holocaust and undevelopment and often conflicted responses to the military and war. The Holocausts Women of color are survivors of and remain casualties of holocausts, and we are direct victims of war-that is, of open armed conflict between countries or between factions within the same country. But women of color were not soldiers, nor did we trade animal pelts or slaves to the white man for guns, nor did we sell or lease our lands to the white man for wealth. Most men and women of color resisted and fought back, were slaughtered, enslaved, and force marched into plantation labor camps to serve the white masters of war and to build their empires and war machines. People of color were and are victims of holocausts-that is, of great and widespread destruction, usually by fire. The world as we knew and created it was destroyed in a continual scorched earth policy of the white man. The experience of Jews and other Europeans under the Nazis can teach us the value of understanding the totality of destructive intent, the extensiveness of torture, and the demonical apparatus of war aimed at the human spirit. A Jewish father pushed his daughter from the lines of certain death at Auschwitz and said, "You will be a remembrance-You tell the story. You survive." She lived. He died. Many have criticized the Jews for forcing non-Jews to remember the 6 million Jews who died under the Nazis and for etching the names Auschwitz and Buchenwald, Terezin and Warsaw in our minds. Yet as women of color, we, too, are "remembrances" of all the holocausts against the people of the world. We must remember the names of concentration camps such as Jesus, Justice, Brotherhood, and Integrity, ships that carried millions of African men, women, and children chained and brutalized across the ocean to the "New World." We must remember the Arawaks, the Taino, the Chickasaw, the Choctaw, the Narragansett, the Montauk, the Delaware, and the other Native American names of thousands of U.S. towns that stand for tribes of people who are no more. We must remember the holocausts visited against the Hawaiians, the aboriginal peoples of Australia, the Pacific Island peoples, and the women and children of Hiroshima and Nagasaki. We must remember the slaughter of men and women at Sharpeville, the children of Soweto, and the men of Attica. We must never, ever, forget the children disfigured, the men maimed, and the women broken in our holocausts-we must remember the names, the numbers, the faces, and the stories and teach them to our children and our children's children so the world can never forget our suffering and our courage. Whereas the particularity of the Jewish holocaust under the Nazis is over, our holocausts continue. We are the madres locos (crazy mothers) in the Argentinian square silently demanding news of our missing kin from the fascists who rule.We are the children of El Salvador who see our mothers and fathers shot in front of our eyes**.** We are the Palestinian and Lebanese women and children overrun by Israeli, Lebanese, and U.S. soldiers**.** We are the women and children of the bantustans and refugee camps and the prisoners of Robbin Island. We are the starving in the Sahel, the poor in Brazil, the sterilized in Puerto Rico. We are the brothers and sisters of Grenada who carry the seeds of the New Jewel Movement in our hearts, not daring to speak of it with our lipsyet. Our holocaust is South Africa ruled by men who loved Adolf Hitler, who have developed the Nazi techniques of terror to more sophisticated levels. Passes replace the Nazi badges and stars. Skin color is the ultimate badge of persecution. Forced removals of women, children, and the elderly-the "useless appendages of South Africa"-into barren, arid bantustans without resources for survival have replaced the need for concentration camps. Black sex-segregated barracks and cells attached to work sites achieve two objectives: The work camps destroy black family and community life, a presumed source of resistance, and attempt to create human automatons whose purpose is to serve the South African state's drive toward wealth and hegemony. Like other fascist regimes, South Africa disallows any democratic rights to black people; they are denied the right to vote, to dissent, to peaceful assembly, to free speech, and to political representation. The regime has all the typical Nazi-like political apparatus: house arrests of dissenters such as Winnie Mandela; prison murder of protestors such as Stephen Biko; penal colonies such as Robbin Island. Black people, especially children, are routinely arrested without cause, detained without limits, and confronted with the economic and social disparities of a nation built around racial separation. Legally and economically, South African apartheid is structural and institutionalized racial war. The Organization of African Unity's regional intergovernmental meeting in 1984 in Tanzania was called to review and appraise the achievements of the United Nations Decade for Women. The meeting considered South Africa's racist apartheid regime a peace issue. The "regime is an affront to the dignity of all Africans on the continent and a stark reminder of the absence of equality and peace, representing the worst form of institutionalized oppression and strife." Pacifists such as Martin Luther King, Jr. and Mahatma Gandhi who have used nonviolent resistance charged that those who used violence to obtain justice were just as evil as their oppressors. Yet all successful revolutionary movements have used organized violence. This is especially true of national liberation movements that have obtained state power and reorganized the institutions of their nations for the benefit of the people. If men and women in South Africa do not use organized violence, they could remain in the permanent violent state of the slave. Could it be that pacifism and nonviolence cannot become a way of life for the oppressed? Are they only tactics with specific and limited use for protecting people from further violence? For most people in the developing communities and the developing world consistent nonviolence is a luxury; it presumes that those who have and use nonviolent weapons will refrain from using them long enough for nonviolent resisters to win political battles. To survive, peoples in developing countries must use a varied repertoire of issues, tactics, and approaches. Sometimes arms are needed to defeat apartheid and defend freedom in South Africa; sometimes nonviolent demonstrations for justice are the appropriate strategy for protesting the shooting of black teenagers by a white man, such as happened in New York City. Peace is not merely an absence of 'conflict that enables white middleclass comfort**,** nor is it simply resistance to nuclear war and war machinery**.** The litany of "you will be blown up, too"directed by a white man to a black woman obscures the permanency and institutionalization of war, the violence and holocaust that people of color face daily. Unfortunately, the holocaust does not only refer to the mass murder of Jews, Christians, and atheists during the Nazi regime; it also refers to the permanent institutionalization of war that is part of every fascist and racist regime. The holocaust lives. It is a threat to world peace as pervasive and thorough as nuclear war.

#### The impact is a future structured through the dronopticon – a world of technological sophistication and patrolling that will lead to imprisonment no longer structured and defined by barriers, walls, and bars and a perpetual reproduction of order maintaining psychological terror

Shaw 16 [, I. G. (2016). The Urbanization of drone warfare: policing surplus populations in the dronepolis. Geographica Helvetica, 71(1), 19-28.] //aymen

The atmosphere has been **a crucial space of military power and colonial pacification since the birth of air power** (Satia, 2014). In turn, aerial forms of civil policing were established throughout the second half of the twentieth century, as police forces in the Global North turned towards technology to fight crime. “Los Angeles, for example, developed a particular brand of policing **that emphasized technological sophistication and aggressive patrolling**” (Herbert, 1997:16). The LAPD currently has 19 helicopters, which were first deployed in 1956 after the establishment of its Air Support Division. Indeed, the helicopter has been a central technology for policing megacities across the world (Adey, 2010). Rotary-wing aircraft **enable the police to render the urban terrain visible and impose a form of flexible, mobile control**: whether through high-powered spotlights, video cameras, or loudspeakers. The helicopter materializes the state’s desire to impose order upon the chaotic circulations of the city. In other cases, the helicopter enables the wealthy to bypass the surplus population entirely. Sao Paulo, for example, holds the world’s most private helicopters per capita, which allow the ultra-rich to take to the skies and bypass the city’s terrestrial congestion and social danger (Adey, 2010). But how will the urbanization of drone warfare extend and rework this extant logic? On the one hand, “unmanned vertical policing extends the police dream of pacification through air power, or a scopic verticality” (Wall, 2013:42). Under this understanding, the drone intensifies already-existing regimes of aerial policing – further enclosing the targeted society from above and rendering the illegible spaces of necropolis visible. Yet drones also hold the potential to transform state technics. They materialize a more intimate form of aerial policing that challenges the notion that drones are remote technologies. Currently, the Predator and Reaper class of military drones surveil the ground from up to a flight ceiling of 25 000 and 50 000 feet, respectively. But a big trend in military and domestic robotics is to develop micro- or “nano”- drones that can range in size from a humming bird to an insect. Crucially, by going smaller, the geographies of **state surveillance become more intimate**. Most US police drones in existence today are variants of the small-scale quadcopter drones used by amateur hobbyists. Grand Forks sheriff’s department in North Dakota, for example, owns four drones. This includes the quadcopter Qube, developed by AeroVironment, as well as the US military’s most widely used fixed-wing drone, the hand-launched Raven (Pilkington, 2014). Moreover, advances in artificial intelligence are enabling small-scale nano-drones to cooperate together in emergent, cooperating constellations called “swarms” (Shaw and Akhter, 2012:1500). It is here that the specifics of a dronified form of policing are glimpsed. With an ability to swarm in roving robotic clouds, the (nano-)drone holds the potential to pervade, saturate, and modulate the urban volume in a way that neither the helicopter nor CCTV can adequately perform. Adey (2014:835) has previously written that “atmospheres are becoming objects of security, whilst security itself has gone, or is going, atmospheric.” Perhaps, therefore, we are entering a new technicity of atmospheric security. Crucial to the idea of atmospheric security is that **individuals can be immersed without being physically contained or touched**. Jeremy Bentham’s classic blueprint for a Panopticon is reflected in today’s network of CCTV cameras fused to the urban architecture. This horizontal form of surveillance is complemented by the vertical power of the helicopter. But the police drone – or, rather, the police swarm – will be able to move across both axes of the city and can thus occupy street and sky simultaneously. Accordingly, the police drone disrupts the extant geometries of state power that are constrained to an X and Y axis. Furthermore, nano-drones would be able to move inside workplaces or perch inside of homes undetected. These drones would be able to infiltrate a range of currently inaccessible urban micro-geographies. Such **future police drones thus materialize a swarm-like space of panopticism, or what could be labelled as a deterritorialized dronopoticon**. There are fewer reasons to doubt that, in the future, **swarms of nano-drones will pass freely through the foams of urban** living, shuttling between the biopolis and necropolis, **to ensure that everyone is secured in their right place**. Moreover, by **securing and saturating the urban atmosphere**, the police swarm not only straightforwardly mediates the technogeographies of state power but comes to recalibrate the psychological and emotional landscapes of the humans that it targets. Drone surveillance “**amounts to a psychic imprisonment within a perimeter no longer defined by bars**, barriers, and walls, but by endless circling of flying watchtowers above” (Chamayou, 2015:45). In places outside of the Global North, surplus populations – such as those in Palestine – are already subject to this exact form of atmopsychological security. The fractured geographies of Palestine “are not simply enclosed by Israeli-controlled land on their borders, but also above and below. Israel has refused to hand over control of airspace even after its disengagement from Gaza” (Elden, 2013:48). The dronopticon, then, is more than an architecture of state power; it is an affective swarm capable of enclosing, hacking, and remaking the lifeworlds it infiltrates. Imagine a blueprint for a city to come. A city that will not only materialize the twisted contradictions of the necropolis and the biopolis but will be secured by a robotic police force hell-bent on erasing the possibility of politics. Imagine the dronepolis, the city of the drone. The dronepolis is set to become the latest in a long succession of urban forms that have pacified and policed the surplus population. It advances the logic of the machine-readable “smart city” to its natural and dystopic conclusion: a technologically infused apartheid. The lives of the valued and the surplus would be proximate topographically, but separated by advanced technics. “Clearly, any such social order could only exist on **the basis of fascistic mind control and the continuous exercise of daily police surveillance and violence accompanied by periodic militarised repressions**. Anyone who does not see elements of such a dystopian world already in place around us is deceiving herself or himself most cruelly” (Harvey, 2014a:264). The dronepolis materializes the logic of a capital-intensive form of **exclusionary surveillance that secures segregation**. Already, across many cities in the USA, an abandoned homeless population is subject to draconian antihomeless laws and hostile urban architecture. The dronepolis will be assembled by apparatuses of control that range from territorialized technologies of state power, such as CCTV, to deterritorialized swarms of nano-drones swimming between buildings. In the atmospheres of this desperate city, hypermobile police drones will surround and enter the homes of suspects, in a manhunt in which the human is transformed into an abstract pattern of life: a digital simulacrum chased across the data sets of the targeted society. The dronepolis does not represent a decisive break from the past, then, but is a re-materialization of an already existing social war between a fortified bourgeoisie and a planetary surplus population. And it does so, increasingly, everywhere, as the logics – and profit potential – for a dronified city spread across the planet, skipping between colony and metropole. “Oligarchic capitalist class privilege and power are taking the world in a similar direction almost everywhere. Political power backed by intensifying surveillance, policing and militarised violence is being used to attack the well-being of whole populations deemed expendable and disposable” (Harvey, 2014a:292). Describing the ascendance of dronified policing, Neocleous (2014:162) writes, “This is nothing less than **a permanent police presence of the reproduction of order** – air power as the everywhere police – in which the exercise of violence is an ever-present possibility.” And this ever-present possibility of police violence **materializes a landscape of psychological terror**. In its most draconian stage, the dronepolis dissolves entirely the lines between the biopolis and necropolis, such that “even those bourgeois communities and citizens usually eclipsed from the police gaze will come under the stare of unmanned policing, to that extent that air power obliterates any useful distinction between suspect and bystander, target and nontarget” (Wall, 2013:49). Finally, many of the police drones of the dronepolis will be weaponized. While attaching lethal missiles may appear a distant reality, what about Tasers? In 2015, North Dakota became the first state to legalize less-than-lethal weaponized drones: flying robots fitted with tear gas, rubber bullets, Tasers, or beanbags (Wagner, 2015). Whether this opens the door to other police forces remains to be seen – as does the complicated and emergent geographies of legal, social, and political resistance. Additionally, non-state actors will disrupt the smooth running of the dronepolis while nonetheless feeding its power. Recently, police in Tokyo established the first “drone squad” tasked with capturing nuisance drones flown by the public, as well as patrolling important government buildings (BBC News, 2015). This atmospheric securitization followed a 2015 incident when a drone carrying a radioactive substance landed on the Japanese prime minister’s office. Such a topography of ultra-secured government and corporate headquarters fitted with anti-drone shields and patrolled by police drones will be a hallmark of our looming urban landscapes. The dronepolis is the city of a robotic capitalism severing from human welfare, the city of an intimately targeted society, the city of a surplus and hyper-secured humanity.

### OFF – Celestial Innovation

#### Innovation high now but aff trades off

Raghavan 21[Seetha Raghavan, Seetha Raghavan is a professor in UCF’s Department of Mechanical and Aerospace Engineering. 8-4-2021, "The Impact of Innovation in the New Era of Space Exploration," University of Central Florida News | UCF Today, https://www.ucf.edu/news/the-impact-of-innovation-in-the-new-era-of-space-exploration/]/ISEE

Every once in a while, a confluence of discoveries, events and initiatives results in a breakthrough so significant that it propels the entire world to a higher level, redefining what is possible in so many different fields. This breakthrough is taking centerstage now, as the new era of space exploration — catalyzed by increasing launch access — dawns upon us. The surge of innovation that comes with this will create new opportunities and inspire the next generation of doers. When this happens, boundaries between scientific and social impact are blurred. Innovation leading to scientific discovery can benefit society in the same way that social innovation can diversify and support scientific innovators, who can contribute to global progress. To ride this wave of progress, we must all participate and innovate in the new era of space exploration. The intersection of space exploration, innovation and impact isn’t a new phenomenon. In the past, technology developments and spin-offs from space research have consistently found their way into communities worldwide sometimes with lifesaving benefits. The International Space Station supports experiments that have led to discoveries and inventions in communication, water purification, and remote guidance for health procedures and robotic surgeries. Satellite-enabled Earth observation capabilities that monitor natural disasters, climate and crops often support early warnings for threats and mitigation strategies. Space exploration has always been relevant to everyone no matter the discipline or interest. Commercialization of space has been key in many ways to the current boost in “firsts” over the last few years. It has spurred innovation in launch vehicles and related technologies that led to firsts in vertical-takeoff-vertical landing rocket technology, reusability of rocket boosters and privately developed crewed missions to orbit. Concurrently, NASA has continued to captivate our imagination with the first flight of a helicopter in another world, a mission to return an asteroid sample to Earth and sending a probe to make the closest ever approach to the sun. While we celebrate the scientific progress, there is a vastly important question that we all need to focus on: How can we drive the surge in innovation offered by increased access to space, to benefit humankind? Access to low-Earth orbit, and eventually human exploration of space, is a portal to achieve many impactful outcomes. The numbers and completion rate of microgravity experiments conducted by scientists will be greatly increased as a range of offerings in suborbital flights provide more opportunities to advance critical research in health, agriculture, energy, and more. Lunar, planetary, and even asteroid exploration may lead to discoveries of new materials — busting the limitations now imposed on capabilities for energy, transportation, and infrastructure or creating new sensors and devices that enhance safety on Earth. Space tourism —one can hope — has the power to potentially create an awareness of our oneness that may lead to social change.

#### Commercial space innovation stops extinction

Charles Beames 18, Chairman of the SmallSat Alliance, Executive Chairman of York Space Systems, former Principal Director of Space and Intelligence in the Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics (OUSD(AT&L)), Col. (ret.) in the USAF where he served 23 years in space & intelligence leadership positions around the world, 8/8/18, “Op-ed | SmallSat Alliance is on a path toward a new space horizon,” <https://spacenews.com/op-ed-smallsat-alliance-is-on-a-path-toward-a-new-space-horizon/>

We find ourselves still at the dawn of a new space century, mindful of the victories and setbacks of our past, eager to pass the torch to the next generation of space visionaries, scientists, engineers, and enthusiasts. We look to the future not just to see how much bigger, faster, or higher we can reach, but also how the United States, and specifically the U.S. space community, can again inspire the nations of the world to align with us, as it did in the 20th century. The SmallSat Alliance is an alliance of companies developing, producing, and operating in all segments of the ‘next generation’ space economy; championing renewed U.S. leadership in the burgeoning commercial space economy, and advocating for the transformation of government-led space capabilities. We are experienced space professionals who have chosen to join with others leveraging our decades of hard-won experience, to develop smarter ways to explore space in the 21st century. A wonderful outgrowth of the legacy space program is the commercial, entrepreneurial, and job-creating commercial space business that it bequeathed. These next-generation enterprises range from multi-million-dollar startups providing rideshare opportunities or components for small satellites to multi-billion-dollar space data-analytic platforms reinventing urban car service and agricultural production. The early returns of this economic revolution are already on our doorstep: space data capabilities are exponentially growing elements of the 21st century world economy. Beginning with the dreams and funding by successful tech entrepreneurs, enormous venture investments are already delivering wondrous benefits to the world. Commercial Space – Profit and Non-Profit There are really two major categories in the commercial sector, the profit driven and the non-profit. The classic for-profit companies include not only those designing, building, launching, and operating satellites but also the tech sector that is turning that raw space data into gold through machine-learning analytics. Since for-profit companies are no longer dependent upon the revenues generated by the Cold War space race culture of a bygone era, this new generation of space companies is able to more efficiently capitalize on Moore’s Law, the nonstop exponential growth in chip density, and the associated networking technology co-evolving with it. This new generation is building profitable businesses helping to clean up our oceans of garbage and debris with satellite surveillance, reconnoitering to assist in enforcing laws that protect our oceans from illegal, unregulated, unlicensed fishing, something that is rapidly depleting the world’s most valuable and essential lifeforms. It’s leading in the innovative use of low-cost satellite constellations to produce ubiquitous remote-sensing data, enabling small business owners to be more profitable and less wasteful. For example, precise timing signals from space are already optimizing transportation of people, goods, and services, with even further gains anticipated with the introduction of artificial intelligence to assist drivers, perhaps even someday replacing them entirely. The non-profit sector is the other side of commercial space, concerned more for the general welfare of society, but every bit as integral to this new space enterprise. Much like every century before it in human history, ours is not without its unique challenges, some of which have been a consequence of the last, and all of which the space data domain can be leveraged to help solve. Examples are endless, but one challenge that this new space community is uniquely well-adapted for is to further inform worldwide resource allocation for the 21st century and beyond. These two primary resources are sustainable water and the materials needed for adequate housing for an ever-increasing human population. As cities and urbanization continue to expand, governmental planning challenges such as transportation design optimization for goods and services are only the beginning. Additionally, through using inexpensive remote sensing technologies, some members are designing space data analytics to mitigate human suffering from plagues, contain outbreaks, and combating illegal poaching. Some are connecting with other non-profits to curtail human trafficking for the sex trade or forced labor for migrant debt repayment. Still others are helping non-governmental organizations in their work to expose the use of children as soldiers. Addressing these challenges has little to do with resuscitating dreams conceived by long deceased science-fiction writers and much more to do with turning “swords back into plowshares” to solve real threats to humanity. Other non-profit initiatives include pursuing an even more foundational understanding of who we are and how to be the best custodians of our environment. Much as exploring and monitoring the world’s oceans has advanced civilization through a better understanding of human life and the planet, so too does exploring and monitoring from space. Low Earth orbit (LEO) provides a unique vantage point to look back on the planet and understand what is happening, anticipate what might happen and prepare for the future. In addition to better understanding Earth, responsible and rapid exploitation of the low Earth orbit domain will enhance the understanding of the solar system and the rest of the universe. Small satellites already offer low-cost platforms to study and explore what lies beyond the Earth. Other members are pioneering the use of zero-carbon, hydrogen-based reusable propulsion systems to ensure we don’t worsen our atmosphere using kerosene-fueled rockets for the coming tsunami of satellite launches. Finally, a mission ensuring the general welfare and planet survival for the next thousand years is finally confronting the existential threat that asteroids and comets pose to humanity. These extra-terrestrial, deep-space threats are passing dangerously close to our planet, and today we have no solar map of them and no defense.

### OFF - Satilites Bad

#### Debris takes out our satellites.

Mark Buchanan 18, an American physicist and author. He was formerly an editor with the international journal of science Nature, and the popular science magazine New Scientist. He has been a guest columnist for the New York Times, and currently writes a monthly column for the journal Nature Physics, ThePrint, 20 September, 2018, "Junk in space is a huge threat to everything from Internet to GPS &amp; weather forecasts", https://theprint.in/opinion/junk-in-space-is-a-huge-threat-to-everything-from-internet-to-gps-weather-forecasts/121445/

Last Saturday, the National Aeronautics and Space Administration launched the Ice, Cloud and Land Elevation Satellite-2, which will monitor Earth’s ice sheets, recording changes in ice thickness as small as half a centimeter. The satellite will allow us to see one consequence of our collective pressure on the planet’s environment. And yet it will, in a small way, also exacerbate another emerging global problem.

The U.S. Air Force — more precisely, the U.S. Strategic Command — is already actively tracking more than 20,000 satellites, rocket pieces and collision fragments bigger than a softball that are orbiting the earth, which together present a looming menace to satellite operations and everything that depends on them, including global positioning systems, telecommunications, weather forecasts and the internet. Over 50 years ago, when we first started putting satellites in orbit, we seemed small, and the earth very big. Now, with nearly 500 new satellites going up every year, our influence is no longer small. Congested space is another reflection of our entry into the Anthropocene — a new era of history in which everything about the earth and its climate, even the space around it, is profoundly affected by human activity.

NASA scientists began thinking about potential space overcrowding in the early 1970s, when the number of satellites in orbit was approaching 4,000. In an influential paper, space scientists Donald Kessler and Burton Cour-Palais made a rough estimate that, as the number of satellites grew, the risk of collisions would become an issue by the 2000s. They weren’t far off. In 2009, a U.S. commercial satellite collided with an inactive Russian communications satellite at a speed of some 26,000 miles per hour, creating two clouds of debris that rapidly dispersed throughout low Earth orbits, at anywhere from 400 to 1,000 miles above the earth.

More important, Kessler and Cour-Palais also pointed to a serious risk that would arise if the number of objects in low or medium Earth orbits became too high: A higher density of objects, they argued, makes it more likely that the secondary fragments created in one collision will in turn strike other objects. A sufficient density of debris could set the stage for a fragmentary chain reaction that could quickly render the entire space around Earth unusable.

#### Satellites key to drones and PGS

Jeremy Rabkin 17, Professor of Law at George Mason University; and John Yoo, Professor of Law at the University of California-Berkeley, 2017, Striking Power: How Cyber, Robots, and Space Weapons Change the Rules of War, p. 193-194

Since the end of the Cold War, space-based military systems have come to exert a more direct terrestrial impact. The global positioning system (GPS) allows U.S. aircraft, naval vessels, and ground units to locate their whereabouts and to direct their fire with precision. The stunning speed of the initial invasion of Iraq in 2003, like the earlier triumph of the Persian Gulf War in 1991, demonstrates the lethal success of military’ operations that integrate satellite communications and information gathering. The drone campaign against terrorist leaders in the Middle East and Pakistan depends on satellites to locate targets, conduct real-time surveillance, and then control the fire systems of the drones.

The future holds even more advances in store. Building on precision-guided munitions, the U.S. Defense Department is developing a “prompt global strike” system that will use GPS satellites to guide hypersonic missiles, armed with conventional warheads, to targets anywhere in the world within an hour.1 More exotic versions envision bombardments from orbital platforms using rods, which would generate their explosive force purely from the kinetic energy created by their high terminal velocity upon reentering the atmosphere. American planners speculate that such systems could replace the need for tactical nuclear weapons because of their combination of precision, speed, and destructive potential.

#### PGS causes destabilization and conflict.

Raf Casps 18, lecturer at the University of Birmingham and a Visiting Researcher at the United Nations Institute of Disarmament Research in Geneva before joining King’s College London and the UK’s Joint Services Command and Staff College. PhD in International Relations from Cambridge University, Medium, 6-21-2018, "Conventional Prompt Global Strike: Enhancing Deterrence?", https://medium.com/raf-caps/conventional-prompt-global-strike-enhancing-deterrence-dac5a0fe6af7

Undermining stability and deterrence

While past US Administrations have viewed CPGS as enhancing deterrence, these weapons have provoked intense debate, in particular how they will impact crisis stability. One of the most significant concerns is that Russia will view such weapons as a direct threat to its Strategic Nuclear Forces. Indeed, this outlook appears in Russian doctrine, and in policy statements in various international fora. For instance, at the 2015 Nuclear Non-proliferation Treaty Review Conference, the head of the Russian delegation stated that US policy hinders further nuclear reductions through its ‘intransigent course’, undermining strategic stability by pursuing, among other things, a missile defence system and the “prompt global strike” concept.[6] This is a consistent mantra. However, some argue that Russia overstates the danger to its forces. Russia is the only state beyond the US with a warning system that is capable of detecting a missile launch. Its over-the-horizon and space-based capabilities should be easily capable of discerning the difference between an ICBM and a CPGS weapon. And while a greater proportion of its deterrent is land-based than that of the US (and clearly that of Britain or France), Russia maintains a significant second-strike capability with its SLBM force. Russia’s willingness to introduce nuclear weapons at a lower threshold than other powers is also clearly established. Therefore, a disarming strike by the US against the Russian ICBM force, or perhaps even its command and control structure, would seem highly risky, and therefore unlikely. Nonetheless, Russia’s sensitivity over their nuclear deterrent cannot be underestimated. The nuclear deterrent is seen as integral to Russia’s claim to be a great power. In addition to this, Russian policy makers are keenly aware of the inferiority of their conventional forces to the US, which acts to magnify both the symbolic and strategic value of nuclear weapons to the Kremlin. Any perceived threat, real or otherwise, will serve to create significant concerns in Moscow.

The perceived threat from these weapons is further amplified when CPGS is allied to missile defence systems. There are numerous statements by Russian and Chinese officials as to the combined effect of these conventional systems, and their capability of a disarming first strike. Such fears have driven Russia to increase its reliance on tactical nuclear weapons, and to upgrade the robustness of its nuclear systems, while also hastening aerospace defence capabilities. The reliance on tactical nuclear weapons in particular brings negative consequence in terms of security and control. They are widely held to highly destabilizing, and change the metrics of deterrence.

Further concerns are created by the ambiguities that are inherent in CPGS designs. These relate to the type of warhead, the country targeted, and the type of target. The points relating to the ambiguity of whether a weapon carried a nuclear or conventional warhead has been discussed above. The withdrawal of funding for the CTM has probably eradicated this as an uncertainty, at least as far as the US programme is concerned. Basing options and inspections would serve to eliminate the vestiges of any further doubt. However, the latter two concerns are more persistent. The ability of CPGS platforms to manoeuvre means that their destination cannot be determined until late in the flight envelope — perhaps not until the final moments. Thus a strike on a third party could be interpreted by Russia (and perhaps China in the future if it builds a missile warning system) as a strike on itself, and trigger a response. The likelihood of such a scenario is slim, but cannot be discounted entirely. Similarly, a state detecting an incoming strike (again, only Russia currently) may incorrectly assume that the strike is targeting its nuclear capabilities, rather than conventional forces. The fear would be that it would result in a serious escalation of tension, or even a nuclear retaliation. However, it is worth noting that the current costs of CPGS technologies would mean that such strikes would involve very limited number of weapons. Such numbers may not be considered sufficient for Russia to retaliate, though they might present a greater concern for China and its smaller nuclear force. Thus it is unlikely that a CPGS strike would be overwhelming. Once more, however, it may be perceptions that matter most. The cost and complexity of US CPGS systems make it hard to persuade Moscow or Beijing that they are designed for much less capable states, and there appears an assumption that ‘orthodox’ nuclear deterrence may be ineffective against conventional counterforce threats.

Thus there is concern that CPGS could have significant impact on the global nuclear order, and perhaps also nuclear proliferation. Even though the US ties these to nuclear reductions, the increased emphasis on conventional weaponry may do very little to allay security concerns in other states. In a scenario of decreased nuclear weapons numbers, conventional weapons will only increase in salience. The consequences could reduce the prospects for future nuclear reductions, and possibly increase tendencies towards proliferation.

Beyond the potential effects on escalation dynamics, questions remain as to how well these weapons would perform their mission. As CPGS rely on precision for their effect, an important consideration is exactly how precise such a weapon would be, given range and manoeuvring, particularly in environments where navigational signals are degraded or denied. Related to this, the timeliness of information is critical. How the requisite ISTAR assets can be brought to bear in non-permissive environments to provide this information, and indeed if they can, whether they wouldn’t be a more effective delivery platform themselves, are further issues that need resolving. Stealth platforms, or future armed reconnaissance Remotely Piloted Air Systems (RPAS) could be more effective in this role.[7]

## Case

### Inherency

#### Countless OST violations now and no impact – its unenforceable and filled with loopholes

Philip Yiannopoulos 18. "Inside the epic debate on rethinking our 50-year-old Outer Space Treaty." Fast Company. 9-24-2018. https://www.fastcompany.com/90240304/inside-the-epic-debate-on-rethinking-our-50-year-old-outer-space-treaty

That’s a lot of activity, fueling intense discussions and fiery debates about the commercialization and militarization of space, the proper role of humans in our galaxy, and the future of humanity. Yet it’s all guided by an outdated set of rules that were established a few years before Neil Armstrong took that first fateful step on the moon. The 1967 Outer Space Treaty was shaped by paranoia over the space race between the Soviets and the Americans, and even the brightest minds of the time couldn’t anticipate the complexities of now and tomorrow. In a long-overdue effort to prepare for that future, on Tuesday the UN will use the 50th anniversary of a Conference on the Exploration and Peaceful Uses of Outer Space to “renew and strengthen its mandate” and to call attention to developing pertinent laws. As it stands, the current treaty bans the placement of WMDs in space, forbids any military action past the atmosphere, and declares the exploration of space for the benefit of all countries. But the 50-year-old treaty definitely needs some updating. While speaking as a U.S. Representative from Oklahoma, Jim Bridenstine said the treaty was mired in Cold War thought, and “now, almost every nation on Earth has some sort of presence in space, and we have to be concerned with threats like jamming, dazzling, spoofing, and hacking satellite constellations.” (Bridenstine was eventually tapped by Trump to head NASA, despite his lack of scientific experience.) AS BELOW, SO ABOVE So what kind of challenges should we expect going forward? Well, as below, so above. A look at the UN’s Convention on the Law of the Sea illustrates some current and potential problems. This treaty eventually established seabeds and ocean floor “beyond the limits of national jurisdiction.” The Law of the Sea proclaims such international spaces as the Common Heritage of Mankind, a phrase now applied to outer space. Unfortunately, humanistic rhetoric is no match for strategic military advantage. And worse, the UN has a track record of being toothless. Recently China started building islands near the Philippines, a clear violation of international law. The nation then flat-out lied about its intention to militarize these spaces. China simply did not attend its hearing at the International Court of Justice. Similar problems exist in today’s space race as different countries militarize in orbit. The EU’s Galileo satellite “proposes more civil-military synergies in European space systems,” two-thirds of Russia’s satellite force is military, and, of course, plans for the U.S.’s Space Force are proceeding apace. Legally, these actions fall within the Outer Space Treaty. Founder of the Global Space Law Center, Mark Sundahl, explains, “You can’t stop countries putting things into space for the purposes of self-defense.” Yet there are some lines that shouldn’t be crossed, he argues. In 2007 China destroyed one of its own satellites. Technically the event did not break the peaceful use clause, but arms controls experts considered the explosion a flex of military muscle. “I mean that kind of behavior can’t be tolerated,” Sundahl says. “But no one spoke up against it as being a violation of the law. And as far as international community says right now, those kinds of action are legal . . . which is ridiculous.” The Chinese actions prompted American response, and added to the biggest problem facing the developing space industry today: orbital junk. Raising awareness about the debris cluttering space takes up a lot of time at the Secure World Foundation, as well as its mission to promote “cooperative sustainability” in space. As project manager Josh Wolny says, its mission is to “help everyone realize they are invested in space and they have something to lose if the environment is damaged.” The foundation generates research and works with the UN as well as private companies to prepare for a successful space industry. Wolny refers to something called the Kessler Syndrome, an increasingly likely scenario in which space junk crashes into a satellite, and thus produces more debris to become part of an ever-growing spiral that inevitably makes it almost impossible to safely launch into space or satellite orbit. And given our current lack of action when it comes to the Texas-sized garbage patch of plastic floating in the Pacific, orbital cleanliness may be a pipe dream. You may assume it’s government’s job to protect the cosmos, but it’s not that simple. First of all, there are differing opinions about where in space all those hunks of metal are exactly located. And with tech tycoons like Elon Musk and Jeff Bezos funding development, they face little legal regulation. After orbit, companies will be within the jurisdiction of the country from which they chose to launch, similar to the high seas’ “flag of convenience.” But some are negotiating claims in advance per astronaut or even per specific mission, according to a recent article in The Atlantic. Things will get complicated. A COSMOS OF COMPLICATIONS At the Global Space Law Center, Mark Sundahl explains the difficulties of the developing space law field, especially when it comes to commercialization. “I’m trying to strike the right balance. We’re being prospective where it can help the industry,” he says. Before businesses invest in space, they need protection. “They’re actually begging for regulation,” he says, “to give investors peace of mind.” However, he also points out complications in things like safety regulations for tourist flights “because we don’t know what to regulate. We don’t know what a safe design is really like.” Similar questions exist for space mining, on-orbit refueling, servicing of satellites, private orbital space stations, or even the first hotel on the moon (which, as it stands, is totally illegal). In the United States, space diplomacy is in its nascent stages. Andrea Thompson, the U.S. Undersecretary for Arms Control and International Security, said discussions at the State Department are just getting under way to address the major questions, such as: “What is a responsible nation state’s behavior in space?” And while the U.S. Congress has struggled with the urgency of reforming space law, President Trump threw a wrench in the works by announcing the Space Force, which came as a surprise to many at NASA and in the space community after he signed a bill to reduce satellite clutter.

#### OST prohibits space mining – squo solves – they do not meaningly change it

Bhattacharya 18 [Kriti Bhattacharya, National University of Juridical Sciences, West Bengal, India.] “The Viability of Space Mining in the Current Legal Regime” Astropolitics The International Journal of Space Politics & Policy Volume 16, 2018 - Issue 3 (https://doi.org/10.1080/14777622.2018.1536858)

Several private players have expressed their desire to mine resources in space. This posits ethical and legal concerns. Several scholars argue that space mining activities flout the national non-appropriation principle enshrined in Article II of the Outer Space Treaty. However, it is the opinion of the author that space mining does not per se violate the provisions of Article II, though space mining brings forward other concerns of breach of cooperation and environmental damage. The current legal regime is not adequately equipped to address these problems. The national legislations of several countries which allow for space mining do not address these issues. Even though an international regime emulating deep seabed mining addresses some of these concerns, the current political structure is not in favor of such a development. Hence, the legal viability of any potential space mining industry is on tenuous terms.

#### They’re inevitably mining now – proves no brink

Robert Garcia 18. Pacific Council on International Policy. “Regulating International Space Mining, an Enormous Industry.” https://www.pacificcouncil.org/newsroom/regulating-international-space-mining-enormous-industry

Many companies representing various international interests such as Deep Space Industries, British-based Asteroid Mining Corporation (AMC), and U.S.-based Planetary Resources are gearing up to pursue space mining efforts in the possible search for platinum, nickel, gold, and ferrous metals, among other materials. Russia and the European Space Agency are pursuing a joint project to mine ice on the moon. Even the traditionally-earthbound United States Geological Survey (USGS) is getting in on the act.

### Scenario 1 – Climate

#### No ev that proves tradeoff – even if some sats go down – no warrant for why it trades off w warming adaption

#### Their ev is just about data observations – no reason why data observations leads to adaptation

#### Mining solves climate better – ruling it out solidifies earth based mining.

Roberts et al 18 [Siobhan Roberts (Roberts has won a number of Canadian National Magazine Awards,[2] and she is the winner of the Communications Award of the Joint Policy Board for Mathematics "for her engaging biographies of eminent mathematicians and articles about mathematics".She earned a degree in history at Queen's University, then a graduate degree in journalism from Ryerson University in 1997.) et al, 10-19-2018, "Asteroid mining might actually be better for the environment," MIT Technology Review, <https://www.technologyreview.com/2018/10/19/139664/asteroid-mining-might-actually-be-better-for-the-environment/> ]/ISEE

For a certain kind of investor, asteroid mining is a path to untold riches. Astronomers have long known that asteroids are rich in otherwise scarce resources such as platinum and water. So an obvious idea is to mine this stuff and return it to Earth—or, in the case of water, to a moon base or Earth-orbiting space station. There is no shortage of interest in these ventures. In the last decade, investors have funded half a dozen companies that have set their sights on various nearby rocks. To many observers, it’s only a matter of time before such a mission gets the green light. But profit margins are only part of the picture. A potentially more significant aspect of these missions is the impact they will have on Earth’s environment. But nobody has assessed this environmental impact in detail. Today, that changes thanks to the work of Andreas Hein and colleagues at the University of Paris-Saclay in France. These guys have calculated the greenhouse-gas emissions from asteroid-mining operations and compared them with the emissions from similar Earth-based activities. Their results provide some eyebrow-raising insights into the benefits that asteroid mining might provide. The calculations are relatively straightforward. Rocket launches release significant amounts of greenhouse gases into the atmosphere. The fuel on board the first stage of a rocket burns in Earth’s atmosphere to form carbon dioxide. For kerosene-burning rockets, one kilogram of fuel creates three kilograms of CO2. (The second and third stages operate outside the Earth’s atmosphere and so can be ignored.) Reentries are just as damaging. That’s because a significant mass of a re-entering vehicle ablates in the upper atmosphere, producing NOx such as nitrous oxide (N2O), a greenhouse gas that is about 300 times more potent than CO2. By one estimate, the space shuttle released about 20% of its mass in the form of N2O every time it returned to Earth. Hein and co use these numbers to calculate that a kilogram of platinum mined from an asteroid would release some 150 kilograms of CO2 into Earth’s atmosphere. However, economies of scale from large asteroid-mining operations could lower this to about 60 kilograms of CO2 per kilogram of platinum. That needs to be compared with the emission from Earth-based mining. Here, platinum mining generates significant greenhouse gases, mostly from the energy it takes to remove this stuff from the ground. Indeed, the numbers are huge. The mining industry estimates that producing one kilogram of platinum on Earth releases around 40,000 kilograms of carbon dioxide. “The global warming effect of Earth-based mining is several orders of magnitude larger,” say Hein and co. The figures for water are also encouraging. In this case, the authors calculate the greenhouse-gas emissions from an asteroid-mining operation that returns water to anywhere within the moon’s orbit, a so-called cis-lunar orbit. They compare this to the emissions from sending the same volume of water from Earth into orbit. The big difference is that a water-carrying vehicle from Earth can haul only a small percentage of its mass as water. But an asteroid-mining spacecraft can transport a significant multiple of its mass as water to cis-lunar orbit. “Substantial savings in greenhouse gas emissions can be achieved,” say Hein and co. This interesting work should help to focus minds on the environmental impacts of mining, which are rapidly increasing in profile. But it is only a first step. There is significant uncertainty in the numbers here, so these will need to be better understood. Other factors will also eventually need to be taken into account. The Earth-bound mining industry could become more environmentally friendly by using renewable energy rather than burning coal to generate power (as it does in South Africa). Rocket launching could also become greener if more eco-friendly fuels are developed. Both these things would change the numbers. There are also emissions that this analysis does not take into account. For example, it does not include the emissions from mission control on Earth or from launch-pad construction. Then there are the ongoing effects of rocket launches on the ozone layer, which also need to be considered. So there is more work to be done. But Hein and co have taken a significant first step toward realistic environmental life-cycle assessments for asteroid mining, a task that will surely become more pressing as this industry matures.

#### Climate doesn’t cause extinction.

Dr. Amber Kerr et al. 19, Energy and Resources PhD at the University of California-Berkeley, known agroecologist, former coordinator of the USDA California Climate Hub; Dr. Daniel Swain, Climate Science PhD at UCLA, climate scientist, a research fellow at the National Center for Atmospheric Research; Dr. Andrew King, Earth Sciences PhD, Climate Extremes Research Fellow at the University of Melbourne; Dr. Peter Kalmus, Physics PhD at the University of Colombia, climate scientist at NASA’s Jet Propulsion Lab; Professor Richard Betts, Chair in Climate Impacts at the University of Exeter, a lead author on the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) in Working Group 1; Dr. William Huiskamp, Paleoclimatology PhD at the Climate Change Research Center, climate scientist at the Potsdam Institute for Climate Impact Research; 6/4/2019, “Claim that human civilization could end in 30 years is speculative, not supported with evidence,” <https://climatefeedback.org/evaluation/iflscience-story-on-speculative-report-provides-little-scientific-context-james-felton/>, Stras

There is no scientific basis to suggest that climate breakdown will “annihilate intelligent life” (by which I assume the report authors mean human extinction) by 2050.

However, climate breakdown does pose a grave threat to civilization as we know it, and the potential for mass suffering on a scale perhaps never before encountered by humankind. This should be enough reason for action without any need for exaggeration or misrepresentation!

A “Hothouse Earth” scenario plays out that sees Earth’s temperatures doomed to rise by a further 1°C (1.8°F) even if we stopped emissions immediately.

Peter Kalmus, Data Scientist, Jet Propulsion Laboratory:

This word choice perhaps reveals a bias on the part of the author of the article. A temperature can’t be doomed. And while I certainly do not encourage false optimism, assuming that humanity is doomed is lazy and counterproductive.

Fifty-five percent of the global population are subject to more than 20 days a year of lethal heat conditions beyond that which humans can survive

Richard Betts, Professor, Met Office Hadley Centre & University of Exeter:

This is clearly from Mora et al (2017) although the report does not include a citation of the paper as the source of that statement. The way it is written here (and in the report) is misleading because it gives the impression that everyone dies in those conditions. That is not actually how Mora et al define “deadly heat”---they merely looked for heatwaves when somebody died (not everybody) and then used that as the definition of a “deadly” heatwave.

North America suffers extreme weather events including wildfires, drought, and heatwaves. Monsoons in China fail, the great rivers of Asia virtually dry up, and rainfall in central America falls by half.

Andrew King, Research fellow, University of Melbourne:

Projections of extreme events such as these are very difficult to make and vary greatly between different climate models.

Deadly heat conditions across West Africa persist for over 100 days a year

Peter Kalmus, Data Scientist, Jet Propulsion Laboratory:

The deadly heat projections (this, and the one from the previous paragraph) come from Mora et al (2017)1.

It should be clarified that “deadly heat” here means heat and humidity beyond a two-dimension threshold where at least one person in the region subject to that heat and humidity dies (i.e., not everyone instantly dies). That said, in my opinion, the projections in Mora et al are conservative and the methods of Mora et al are sound. I did not check the claims in this report against Mora et al but I have no reason to think they are in error.

1- Mora et al (2017) Global risk of deadly heat, Nature Climate Change

The knock-on consequences affect national security, as the scale of the challenges involved, such as pandemic disease outbreaks, are overwhelming. Armed conflicts over resources may become a reality, and have the potential to escalate into nuclear war. In the worst case scenario, a scale of destruction the authors say is beyond their capacity to model, there is a ‘high likelihood of human civilization coming to an end’.

Willem Huiskamp, Postdoctoral research fellow, Potsdam Institute for Climate Impact Research:

This is a highly questionable conclusion. The reference provided in the report is for the “Global Catastrophic Risks 2018” report from the “Global Challenges Foundation” and not peer-reviewed literature. (It is worth noting that this latter report also provides no peer-reviewed evidence to support this claim).

Furthermore, if it is apparently beyond our capability to model these impacts, how can they assign a ‘high likelihood’ to this outcome?

While it is true that warming of this magnitude would be catastrophic, making claims such as this without evidence serves only to undermine the trust the public will have in the science.

Daniel Swain, Researcher, UCLA, and Research Fellow, National Center for Atmospheric Research:

It seems that the eye-catching headline-level claims in the report stem almost entirely from these knock-on effects, which the authors themselves admit are “beyond their capacity to model.” Thus, from a scientific perspective, the purported “high likelihood of civilization coming to an end by 2050” is essentially personal speculation on the part of the report’s authors, rather than a clear conclusion drawn from rigorous assessment of the available evidence.

### Scenario 2 - Miscalc

#### No miscalc from satellite disruptions

Mazur 12 (Jonathan Mazur, Manager Engineering at Northrop Grumman, writing in Space & Defense, from the Eisenhower Center for Space and Defense Studies. Past U.S. Actions: Redlines in Space. Space & Defense, Volume 6, Number 1, Fall 2012. https://inss.ndu.edu/Portals/97/Space\_and\_Defense\_6\_1.pdf?ver=2018-09-06-135424-147)

U.S. Reactions To Foreign Disruption Of U.S. Capabilities

In the 1970s, it was suspected that a U.S. maritime communications satellite was turned off by the Soviets when it was outside of the range of U.S. tracking stations.25 There does not appear to be any documented U.S. reaction, and I suspect there was none. In the mid-1990s, satellite hackers in Brazil began hijacking U.S. military communication satellite signals to broadcast their own information, though it took until 2009 for Brazil to crack down on the illegal activity with the support of the DoD.26 In 1998, a U.S.-German satellite known as ROSAT was rendered useless after it turned suddenly toward the sun. NASA investigators later determined the accident was possibly linked to a cyber-intrusion by Russia.

The fallout? Though there was an ongoing criminal investigation as of 2008; NASA security officials have seemed determined to publicly minimize the seriousness of the threat.27 In 2003, a signal originating from Cuba—later determined to be coming from Iranian embassy property— was jamming a U.S. communications satellite that was transmitting Voice of America programming over Iran, which was publicly referred to as an “act of war” by a U.S. official. 28 Press reporting indicates the U.S. administration was [frozen]“paralyzed” about how to cope with the jamming that continued for at least a month, even after U.S. diplomatic protests to Cuba.29 In 2005, U.S. diplomats protested to the Libyan government after two international satellites were illegally jammed disrupting American diplomatic, military, and FBI communications.30 In 2006, press reporting indicates that China hit a U.S. spy satellite with a ground-based laser. This action was acknowledged by the then director of the NRO, though the DoD remained tight lipped about the incident.31

“We’re at a point where the technology’s out there, and the capability for people to do things to our satellites is there. I’m focused on it beyond any single event.” – Air Force Space Command Commander, General Chilton, 2006 32

In 2009, a U.S. commercial Iridium communications satellite—extensively used by the DoD—was accidently destroyed by a collision with a dead Russian satellite.33 The U.S. company, Iridium, was able to minimize any loss of service by implementing a network solution within a few days.34 As of early 2011, no legal action had been taken by the company either because it is not clear who was at fault or because it might be politically problematic for the United States, which is trying to enter into bi-lateral transparency and confidence-building measures (TCBM) with Russia regarding space activities.35 Since August of 2010, North Korea has been intermittently using GPS jamming equipment, which reportedly has been interfering with U.S. and South Korean military operations and civilian use south of the North Korean border.36 Reportedly, only South Korea and the United Nations International Telecommunications Union—at the request of South Korea—have issued letters to Pyongyang demanding the cessation of disruptive communications signals in South Korea.37

It appears that the only time the U.S. military has responded with force to a disruption in U.S. space capabilities was in 2003, a few days after the start of the Iraq war.38 According to U.S. officials, Iraq was using multiple GPS jammers—which supposedly did not affect military GPS functionality. However, the U.S. military bombed the jammers anyway after a diplomatic complaint to Russia.39 The use of military force against the GPS jamming threat was possibly because the United States was already intervening in Iraq, and the bombing probably would not have occurred if the United States was not at war.

#### Kessler is inevitable

**Wild 15** (Jim Wild, Professor of Space Physics at Lancaster University, “With So Much Vested In Satellites, Solar Storms Could Bring Life To A Standstill,” July 30, 2015, https://theconversation.com/with-so-much-vested-in-satellites-solar-storms-could-bring-life-to-a-standstill-45204)

These can disrupt satellite operations by depositing electrical charge within the on-board electronics, triggering phantom commands or overloading and damaging sensitive components. The effects of space weather on the Earth’s upper atmosphere disrupts radio signals transmitted by navigation satellites, potentially introducing positioning errors or, in more severe cases, rendering them unusable.

These are not theoretical hazards: in recent decades, solar storms have caused outages for a number of satellites services – and a handful of satellites have been lost altogether. These were costly events – satellite operator losses have run into hundreds of millions of dollars. The wider social and economic impact was relatively limited, but even so it’s unclear how our growing amount of space infrastructure would fare against the more extreme space weather that we might face.

When Space Weather Becomes A Hurricane

The largest solar storm on record was the Carrington event in September 1859, named after the British astronomer who observed it. Of course there were no Victorian satellites to suffer the consequences, but the telegraph systems of the time were crippled as electrical currents induced in the copper wires interfered with signals, electrocuted operators and set telegraph paper alight. The geomagnetic storm it triggered was so intense that the northern lights, usually a polar phenomenon, were observed as far south as the Bahamas.

Statistical analysis of this and other severe solar storms suggests that we can expect an event of this magnitude once every few hundred years – it’s a question of “when” rather than “if”. A 2007 study estimated a Carrington event today would cause US$30 billion in losses for satellite operators and threaten vital infrastructure in space and here on the ground. It’s a risk taken sufficiently seriously that it appears on the UK National Risk Register and has led the government to draw up its preparedness programme.

#### Space miscalc unlikely

Chen Lan 16, an independent analyst and founder of the 'Go Taikonauts!', “Chinese Space Quarterly Report”, January 2016, http://www.go-taikonauts.com/images/newsletters\_PDF/GoTaikonauts18.pdf

During the IAC 2015, China re-iterated the wish for international participation and cooperation in its space station project including extending the station by modules provided by international partners. Twitter messages posted by a European journalist from the Congress, that is still to be confirmed, however, showed a different view from ESA. ESA’s new Director General JohannDietrich Wörner said he had told China that the world does not need two space stations and will likely persuade China to drop its space station in favour of joining the ISS. On the other side, during the traditional “Heads of Space Agencies Panel” in IAC 2015, NASA Administrator Charles Bolden expressed his belief that the current exclusion of China from the ISS will not last forever. Though Sino-U.S. cooperation on human spaceflight is still uncertain, a positive move between the two countries has been made, that is the establishment of a space hotline. Western media reported in November that the hotline has been setup between Washington and Beijing to allow easy sharing of technical information about their space operations, hopefully **avoiding any misunderstandings or accidents.** Russia’s space agency Roscosmos on 17 December signed a cooperation agreement with the China National Space Administration (CNSA). The document was signed at the 20th regular meeting of Russian and Chinese Heads of Government, during Russian Prime Minister Dmitry Medvedev’s three-day visit to Beijing. The two

sides agreed to promote the use of “GLONASS” and “Beidou” and their augmentations in their own countries and around the world, expanding the market of navigation services provided by these systems. The two space agencies signed another agreement on the same day on cooperation in the field of space electronics. It was reported earlier that the two countries were discussing a barter deal that Russia will import Chinese space electronic components and will export rocket engines, presumably the RD-180, to China. However, an official statement about the agreement did not mention the engine. Also on the same day, Russian state-owned nanotechnology company RUSNANO and the China Aerospace Science and Industry Corporation (CASIC) signed a strategic partnership agreement. CNSA also signed an agreement with the Netherlands on 26 October, and a memorandum of understanding with the UAE (United Arab Emirates) on 15 December, on exploration and peaceful use of outer space. A year after India signed its first space cooperation agreement with China, scientists from ISRO and the Chinese space agency have decided on six major areas of interest, including the hosting of payloads on each other’s satellites and inter-planetary missions. The other areas of interest are Earth observation, disaster management, space science and navigation, as the Times of India reported on 5 October. The Brazilian Ministry of Science, Technology and Innovation announced on 30 December that the sixth CBERS (China-Brazil Earth Resources Satellite) satellite, CBERS-4A, is scheduled to be launched into space in December 2018. The Planetary Science Institute signed a cooperation agreement with the Qian Xuesen Laboratory of Space Technology (Qian Xuesen Lab), CAST, on 15 December to advance their mutual interests in facilitating the open-ended expansion of the exploration of the solar system and to use the knowledge thus gained in supporting the expansion of human activity beyond the Earth. Both institutions also wish to advance their common interest in communicating to the public the knowledge and benefits gained through robotic and human exploration of the solar system.

### Scenario 3 – Space Exploration

#### War is inevitable BUT delays cause worse wars

Eugene Romer and Richard Sokolsky 20 {Rumer, a former national intelligence officer for Russia and Eurasia at the U.S. National Intelligence Council, is a senior fellow and the director of Carnegie’s Russia and Eurasia Program. Richard Sokolsky is a nonresident senior fellow in Carnegie’s Russia and Eurasia Program. 9-8-2020. “Etched in Stone: Russian Strategic Culture and the Future of Transatlantic Security.” https://carnegieendowment.org/2020/09/08/etched-in-stone-russian-strategic-culture-and-future-of-transatlantic-security-pub-82657}//JM

New U.S. and Russian conventional weapons could have a profound impact on strategic stability, crisis stability, and arms race stability because they are unconstrained by existing arms control treaties and not subject to any rules or limitations. Absent mutual restraint, the integration of new technologies into the military doctrines and force postures of both countries is likely to have a profoundly destabilizing impact across the board.

THREATS TO STRATEGIC STABILITY

The integration of new conventional weapons technologies into the arsenals and war-fighting plans of the United States and Russia is bound to affect their threat perceptions. The following scenario could be highly destabilizing: a decapitating first strike against strategic command-and-control and early-warning surveillance systems, followed by strikes on offensive systems to blunt a retaliatory strike. The addition of missile defenses to this mix would add to concerns about ensuring survivable second-strike capabilities and strategic stability.

THREATS TO CRISIS STABILITY

Crisis stability—the ability to keep a crisis or confrontation from escalating into a nuclear war—will be threatened if and when the deployment of new weapons systems creates greater incentives to use nuclear or conventional weapons first in a crisis and, particularly, to attack quickly before there is time to collect reliable information and carefully weigh all available options and their consequences.61 As previously noted, some of the new conventional weapons can be delivered from the same platforms as nuclear warheads, making it nearly impossible to determine whether they are carrying either type. This “warhead ambiguity” will be more prevalent and worrisome in the future as the United States and Russia field large numbers of hypersonic boost-glide ballistic and cruise missiles, which travel at tremendous speeds and fly trajectories that make defense against them exceedingly difficult.62 These emerging threats to crisis stability put a much greater premium on preventing and managing crises that could escalate to conventional or nuclear war and mitigating the risk that such a crisis could lead to an inadvertent conflict through misunderstanding or miscommunication.63

These technical and doctrinal innovations pose new threats to European security. They could compromise crisis stability in the conventional military balance in Europe. The United States and Russia will likely seek to deploy these capabilities to offset what they perceive to be their vulnerabilities in a conflict: the United States to compensate for its relative weakness in a short war limited to NATO’s eastern flank and Russia to mitigate the risks it sees in a protracted conflict with NATO. Both countries will put a premium on cyber, artificial intelligence, and hypersonic weapons because of their potential of these to knock out the command, control, communications, computers, intelligence, surveillance, and reconnaissance capabilities of the other side and to disrupt the mobilization of forces—and thus to prevail in a conventional conflict.

The potential for losing a conventional war in Europe, from either side’s perspective, is dangerous because it increases the possibility that the United States or Russia or both might be tempted to believe that limited tactical nuclear weapon strikes could stave off conventional defeat, raising in turn the risk of strategic nuclear escalation. Hence Russia’s flirtation with the “escalate to de-escalate” notion, which has been echoed in its recently released official paper on nuclear deterrence.64

THREATS TO ARMS RACE STABILITY

Arms race stability is typically defined as the absence of incentives to build up nuclear forces, qualitatively or quantitatively.65 Three developments could create such incentives. First, the demise of New START and the inability of the United States and Russia to agree on a follow-on treaty will eliminate many of the treaty-based transparency and verification measures that made their bilateral strategic relationship more predictable. Second, the end of Russian and U.S. overflights of each other’s territory as part of the Open Skies Treaty will also reduce transparency of conventional forces. And, third, the deployment of new conventional technologies as discussed above, if unaccompanied by mutual restraint measures.

The end of the INF Treaty is likely to stimulate a competition to deploy new INF-range systems in Europe and/or air and naval forces on and around the continent with deep-strike capabilities. Overlaying these two challenges on arms race stability is a third: an arms race that will be stimulated as each side introduces new weapons technologies into their force structure, many of which will be able to put second-strike capabilities at risk and defend national territory against retaliatory strikes.

CONCLUSIONS AND IMPLICATIONS

Looking ahead, it is tempting to hope that changes in Russia’s domestic politics or its economic difficulties will trigger shifts in its foreign policy similar to those of the Gorbachev era, and consequently that East-West relations will improve dramatically. However, the framework of Russian strategic culture suggests that such a turn of events is highly unlikely for three reasons.

First, the Gorbachev period in Russian foreign policy was brief—a decade, arguably even less, after which the antagonistic relationship between Russia and the West gradually resumed.

Second, strategic culture is a product of a nation’s domestic political traditions, history, and geography and, by definition, provides an enduring framework for its foreign and security policy. This is not to say that it is permanent and cannot change, but it is unlikely to change as a result of domestic political shifts, which in Russia’s case have proved to be less dramatic than initially anticipated and assessed.

Third, major shifts and retreats in Russia’s foreign and security policy have occurred during periods of domestic weakness, as happened in 1918 after the Bolshevik Revolution and in 1991 after the collapse of the Soviet Union. In both instances, however, attempts to return to the status quo ante began as soon as the country regained even a fraction of its domestic stability and capabilities to project power beyond its borders.

As evident from the above discussion of Russia’s strategic culture, the country’s national security policy has long emphasized control over the periphery and preventing other powers from establishing their foothold there. The invasion of Ukraine is but the latest example of overreaction by Russia’s leaders to the threat, as they see it, of foreign encroachment upon their desired buffer zone and sphere of influence. The experience of U.S. and European efforts in the aftermath of the Cold War to establish a mutually acceptable security regime with Russia for all of Europe demonstrates that the gap is unlikely to be bridged in the foreseeable future, if ever.

The development of new, highly destabilizing conventional and nuclear technologies holds the promise of revolutionary changes in transatlantic security. These changes will likely make obsolete most, if not all, existing approaches to strategic stability and arms control as well as the very idea of treaty-based security arrangements between the United States and its European allies and Russia. To manage this new security environment, which will continue to suffer from deep-seated antagonisms and fundamentally different worldviews, a new approach to conventional and nuclear arms control, strategic stability, and theater-wide European security is needed.

The technical approach to arms control, which prevailed throughout the Cold War and the post–Cold War years, and which presumes that there is an elegant technical solution for challenges to mutual deterrence and stability, is far too apolitical. It is inadequate to ensuring strategic stability for a new era of unregulated competition in conventional weapons technologies. This model for arms control tends to focus on the hardware aspects of the competition and more often than not fails to take into account the less intangible drivers of that competition, such as a nation’s strategic culture and threat perceptions.

#### The United States would respond to Russian attacks against them OR allies with a devastating counterforce – that crushes Russia.

Lonsdale **’**19 [David Lonsdale is the Director of the Centre for Security Studies at the University of Hull, UK, “The 2018 Nuclear Posture Review: A return to nuclear warfighting?,” *Comparative Strategy* 28:2, pub. online, May 17, 2019]

The important question is: what objectives would the U.S. pursue within a nuclear conflict, and how would they be achieved? It appears that the primary objectives sought would be damage limitation (an important component of warfighting) and the reestablishment of deterrence. This fits with the preliminary qualifying statement to this section of the review, in which it is stated that the U.S. would use nuclear weapons in compliance with the law of armed conflict.86 Indeed, the NPR is at pains to note that nuclear forces would only be used for defensive purposes. One assumes that this rules out counter-value targeting (deliberate attacks against enemy population centers). This leaves counterforce operations as the only option. Strikes against enemy nuclear forces and their command and control, in conjunction with active ballistic missile defenses (BMD), would help ensure damage limitation for the U.S. and its allies.87 A focus on counterforce options is reminiscent of later Cold War strategy, when the U.S. increasingly procured weapon systems with increased accuracy and penetrative capability designed for warfighting. Indeed, Lieber and Press argue that increases in accuracy and remote sensing have enhanced the potency of counterforce options, to the point that low-casualty counterforce options are possible for the first time.88 One can reasonably assume, although it is not explicitly noted in the review, that the restoration of deterrence would be achieved through a combination of intra-war deterrence by denial (as noted above in relation to counter-escalation strategies) and punishment for coercive purposes. Inclusion of the latter is premised on references to “unacceptable consequences” resulting from nuclear attack elsewhere in the NPR. 89 However, in the face of no counter-value targeting, it is reasonable to question how these costs would be inflicted. There are three possible answers, although none of them is discussed in the NPR. First, it may be that the enemy values highly their nuclear forces; so that the loss of them would inflict unacceptable costs. Alternatively, there may be an unwritten assumption that counterforce strikes would inevitably produce “bonus” counter-value damage. Much of the nuclear force infrastructure (including command and control, airbases, etc.) is within or near population centers. Thus, even a limited counterforce strike is likely to have a significant detrimental effect on counter-value targets. This assumption, however, is somewhat thrown into question by the stated desire to procure accurate limited-yield weapons and to operate within the norms of the war convention. Low-yield accurate weapons would be ideal for counterforce missions and would minimize damage to counter-value target sets. Thus, bonus damage is likely to be limited. Finally, although again not explicitly noted in the NPR, perhaps there is a return to the notion of attacking targets associated with political control. Yet again, though, concerns over collateral damage would likely restrict a campaign aimed at the means of political control. We are, thus, left with many questions concerning how the coercive effects of nuclear weapons would be administered. This is problematic, for as Thomas C. Schelling eloquently noted, “The power to hurt can be counted among the most impressive attributes of military force.” 90 It has to be concluded that the uncertainties in this area of strategy reflect either a paradox or incomplete strategic thinking in the NPR. Clarity on these matters would be welcome, especially as it would enhance deterrence credibility still further. Although countervailing is back on the agenda in the 2018 NPR, there is no mention of prevailing in a nuclear conflict. Indeed, the review quotes Defense Secretary Mattis, echoing the early thoughts of Brodie, that nuclear war can never be won, and thus must never be fought.91 This is both curious and disappointing from a warfighting perspective, and speaks to the need for the further development of strategic thinking in U.S. nuclear strategy under Trump. Damage limitation and the reestablishment of deterrence are perfectly admirable goals within the context of nuclear conflict. However, if the U.S. is to achieve its objectives in a post-deterrence environment, it must have a comprehensive theory of victory. Damage limitation and the reestablishment of deterrence are limited negative objectives. They do not provide a positive driving force for the use of nuclear weapons. To reiterate, victory refers to a policy objective that must be achieved in the face of the enemy. And, as Clausewitz reminds us, the will of the enemy must be broken by destroying his ability to resist, or putting him in such a position as his defeat is inevitable.92 If we consider the conditions under which U.S. nuclear weapons could be used, as stipulated by the 2018 NPR, then we can assume that an enemy power (likely) Russia, China, North Korea, or a state-sponsored terror group) has launched a substantial attack on either the U.S. or one of its allies. We can think in terms of a Russian assault on the Baltic States, a North Korean attack on South Korea, or perhaps a Chinese invasion of Taiwan. Alternatively, the U.S. may have been subjected to a substantial strategic attack, involving either weapons of mass destruction (including biological or chemical) or a crippling cyberattack. In any of these scenarios, more expansive objectives would be required. As Lieber and Press note, “In some cases, wars may be triggered by events that compel U.S. leaders to pursue decisive victory, conquest, and/or regime change.” 93 Thus, in order to achieve its objectives, the U.S. would variously need to: punish an aggressor to reinstate deterrence; defeat enemy forces for damage limitation or to reclaim lost territory; and, in the North Korean case, presumably overthrow a communist regime. In some of these cases, damage limitation and the reestablishment of deterrence would not be enough. Enemy forces would have to be defeated, removed, destroyed, or coerced (to withdraw from allied territory). Any operations in pursuit of these goals would need a theory of victory built on a detailed understanding of the use of nuclear weapons in the service of military objectives; i.e., nuclear warfighting. This could include defeating enemy nuclear forces for force protection of U.S. and allied conventional forces. Alternatively, U.S. nuclear forces may be required to defeat regionally superior enemy conventional forces. And yet, as previously noted, the NPR rules out a return to nuclear warfighting. This is a significant disjuncture in U.S. nuclear strategy. It is even more curious when one considers the range of modern forces the Trump administration seeks to acquire under the 2018 NPR.

#### Limited nuclear war won’t cause extinction, but solves future use

Daniel Deudney 18. Associate Professor of Political Science at Johns Hopkins University. 03/15/2018. “The Great Debate.” The Oxford Handbook of International Security. www.oxfordhandbooks.com, doi:10.1093/oxfordhb/9780198777854.013.22. //reem

Although nuclear war is the oldest of these technogenic threats to civilization and human survival, and although important steps to restraint, particularly at the end of the Cold War, have been achieved, the nuclear world is increasingly changing in major ways, and in almost entirely dangerous directions. The third “bombs away” phase of the great debate on the nuclear-political question is more consequentially divided than in the first two phases. Even more ominously, most of the momentum lies with the forces that are pulling states toward nuclear-use, and with the radical actors bent on inflicting catastrophic damage on the leading states in the international system, particularly the United States. In contrast, the arms control project, although intellectually vibrant, is largely in retreat on the world political stage. The arms control settlement of the Cold War is unraveling, and the world public is more divided and distracted than ever. With the recent election of President Donald Trump, the United States, which has played such a dominant role in nuclear politics since its scientists invented these fiendish engines, now has an impulsive and uninformed leader, boding ill for nuclear restraint and effective crisis management. Given current trends, it is prudent to assume that sooner or later, and probably sooner, nuclear weapons will again be the used in war. But this bad news may contain a “silver lining” of good news. Unlike a general nuclear war that might have occurred during the Cold War, such a nuclear event now would probably not mark the end of civilization (or of humanity), due to the great reductions in nuclear forces achieved at the end of the Cold War. Furthermore, politics on “the day after” could have immense potential for positive change. The survivors would not be likely to envy the dead, but would surely have a greatly renewed resolution for “never again.” Such an event, completely unpredictable in its particulars, would unambiguously put the nuclear-political question back at the top of the world political agenda. It would unmistakeably remind leading states of their vulnerability It might also trigger more robust efforts to achieve the global regulation of nuclear capability. Like the bombings of Hiroshima and Nagasaki that did so much to catalyze the elevated concern for nuclear security in the early Cold War, and like the experience “at the brink” in the Cuban Missile Crisis of 1962, the now bubbling nuclear caldron holds the possibility of inaugurating a major period of institutional innovation and adjustment toward a fully “bombs away” future.

#### Absent war---Russia develops AI---extinction

Mike Rogers 17 (Mike Rogers is a former US Representative from Michigan, chairman of the House Permanent Select Committee on Intelligence, “Artificial intelligence — the arms race we may not be able to control," TheHill, 9-21-2017, https://thehill.com/opinion/technology/351725-artificial-intelligence-is-the-new-arms-race-we-may-not-be-able-to-control)(Shiv)

“Whoever becomes the leader in this sphere will become ruler of the world,” [said](https://www.theverge.com/2017/9/4/16251226/russia-ai-putin-rule-the-world) Vladimir Putin. The sphere the President of Russia is referring to is artificial intelligence (AI) and his comments should give you a moment of pause. Addressing students at the beginning of our Labor Day weekend, Putin remarked “Artificial intelligence is the future, not only for Russia, but for all humankind,” adding, “It comes with colossal opportunities, but also threats that are difficult to predict.” For once, I find myself in agreement with the President of Russia, but just this once. Artificial Intelligence offers incredible promise and peril. Nowhere is this clearer than in the realm of national security. Today un-crewed systems are a fact of modern warfare. Nearly every country is adopting systems where personnel are far removed from the conflict and wage war by remote control. AI [stands](https://www.nytimes.com/2016/10/26/us/pentagon-artificial-intelligence-terminator.html) to sever that ground connection. Imagine a fully autonomous Predator or Reaper drone. Managed by an AI system, the drone could identify targets, determine their legitimacy, and conduct a strike all without human intervention. Indeed, the Ministry of Defence of the United Kingdom issued a press [statement](https://www.theverge.com/2017/9/12/16286580/uk-government-killer-robots-drones-weapons) in September that the country “does not possess fully autonomous weapon systems and has no intention of developing them,” and that its weapons systems “will always be under control as an absolute guarantee of human oversight and authority and accountability.” Let’s think smaller. Imagine a tiny insect-sized drone loaded with explosive. Guided by a [pre-programmed AI](https://www.amazon.com/Life-3-0-Being-Artificial-Intelligence/dp/1101946598), it could hunt down a specific target — a politician, a general, or an opposition figure — determine when to strike, how to strike, and if to strike based on its own learning. Howard Hughes Medical Center [recently](https://qz.com/1000011/scientists-attached-an-electronic-backpack-to-a-genetically-modified-dragonfly-and-turned-it-into-a-drone/) attached a backpack to a genetically modified dragonfly and flew it remotely. These examples are, however, where humans are involved and largely control the left and right limits of AI. Yet, there are examples of AI purposely and independently going beyond programed parameters. Rogue algorithms led to a [flash crash](http://gizmodo.com/rogue-algorithm-blamed-for-historic-crash-of-the-britis-1787523587) of the British Pound. In 2016, in-game AIs created super AIs weapons and [hunted down](http://www.kotaku.co.uk/2016/06/03/elites-ai-created-super-weapons-and-started-hunting-players-skynet-is-here) human players, and AIs have [created](https://www.forbes.com/sites/tonybradley/2017/07/31/facebook-ai-creates-its-own-language-in-creepy-preview-of-our-potential-future/#1cf69787292c) their own languages that were indecipherable to humans. AIs proved more effective than their human counterparts in producing and catching users in spear phishing programs. Not only did the AIs create more content, they successfully [captured](https://www.blackhat.com/docs/us-16/materials/us-16-Seymour-Tully-Weaponizing-Data-Science-For-Social-Engineering-Automated-E2E-Spear-Phishing-On-Twitter.pdf) more users with their deception. While seemingly simple and low stakes in nature, extrapolate these scenarios into more significant and risky areas and the consequences become much greater. Cybersecurity is no different. Today we are focused on the hackers, trolls, and cyber criminals (officially sanctioned and otherwise) who seek to penetrate our networks, steal our intellectual property, and leave behind malicious code for activation in the event of a conflict. Replace the individual with an AI and imagine how fast hacking takes place; networks against networks, at machine speed all without a human in the loop. Sound far-fetched? It’s not. In 2016, the Defense Advanced Research Projects Agency held an AI on AI capture the flag contest called the [Cyber Grand Challenge](https://www.youtube.com/watch?v=qSgYu3w3DMM) at the DEF CON event. AI networks against AI networks. In August of this year the founders of 116 AI and robotics companies signed a letter petitioning the United Nations [to ban](https://www.theverge.com/2017/8/21/16177828/killer-robots-ban-elon-musk-un-petition) lethal autonomous systems. Signatories to this letter included Google DeepMind’s co-founder Mustafa Suleyman and Elon Musk who, in response to Putin’s quote [tweeted](https://twitter.com/elonmusk/status/904638455761612800), “Competition for AI superiority at national level most likely cause of WW3 imo (sic)”. AI is not some far off future challenge. It is a challenge today and one with which we must grapple. I am in favor of fielding any system that enhances our national security, but we must have an open and honest conversation about the implications of AI, the consequences of which we do not, and may not, fully understand. This is not a new type of bullet or missile. This is a potentially fully autonomous system that even with human oversight and guidance will make its own decisions on the battlefield and in cyberspace. How can we ensure that the system does not escape our control? How can we prevent such systems from falling into the hands of terrorists or insurgents? Who controls the source code? How and can we build in so-called impenetrable kill switches? AI and AI-like systems are slowly being introduced into our arsenal. Our adversaries, China, Russia, and others are also introducing AI systems into their arsenals as well. Implementation is happening faster than our ability to fully comprehend the consequences. Putin’s new call spells out a new arms race. Rushing to AI weapon systems without guiding principles is a dangerous. It risks an escalation that we do not fully understand and may not be able to control. The cost of limiting AI intelligence being weaponized [could vastly exceed](https://www.belfercenter.org/sites/default/files/files/publication/AI%20NatSec%20-%20final.pdf) all of our nuclear proliferation efforts to date. More troubling, the consequences of failure are equally existential.

#### Space colonization causes extinction – results in species diversification, which undermines cosmic deterrence and creates nearly-infinite security dilemmas – independently, allows for super-weapons that guarantee universe destruction

Torres 19[Phil Torres is the director of the Project for Human Flourishing and the author of Morality, Foresight, and Human Flourishing: An Introduction to Existential Risks. “Why We Should Think Twice About Colonizing Space,” <http://nautil.us/blog/-why-we-should-think-twice-about-colonizing-space>]

There are lots of reasons why colonizing space seems compelling. The popular astronomer Neil deGrasse Tyson argues that it would stimulate the economy and inspire the next generation of scientists. Elon Musk, who founded SpaceX, argues that “there is a strong humanitarian argument for making life multiplanetary…to safeguard the existence of humanity in the event that something catastrophic were to happen.” The former administrator of NASA, Michael Griffin, frames it as a matter of the “survival of the species.” And the late astrophysicist Stephen Hawking has conjectured that if humanity fails to colonize space within 100 years, we could face extinction. To be sure, humanity will eventually need to escape Earth to survive, since the sun will make the planet uninhabitable in about 1 billion years. But for many “space expansionists,” escaping Earth is about much more than dodging the bullet of extinction: it’s about realizing astronomical amounts of value by exploiting the universe’s vast resources to create something resembling utopia. For example, the astrobiologist Milan Cirkovic calculates that some 1046 people per century could come into existence if we were to colonize our Local Supercluster, Virgo. This leads Nick Bostrom to argue that failing to colonize space would be tragic because it would mean that these potential “worthwhile lives” would never exist, and this would be morally bad. But would these trillions of lives actually be worthwhile? Or would colonization of space lead to a dystopia? In a recent article in Futures, which was inspired by political scientist Daniel Deudney’s forthcoming book Dark Skies, I decided to take a closer look at this question. My conclusion is that in a colonized universe the probability of the annihilation of the human race could actually rise rather than fall. The argument is based on ideas from evolutionary biology and international relations theory, and it assumes that there aren’t any other technologically advanced lifeforms capable of colonizing the universe (as a recent study suggests is the case). Consider what is likely to happen as humanity hops from Earth to Mars, and from Mars to relatively nearby, potentially habitable exoplanets like Epsilon Eridani b, Gliese 674 b, and Gliese 581 d. Each of these planets has its own unique environments that will drive Darwinian evolution, resulting in the emergence of novel species over time, just as species that migrate to a new island will evolve different traits than their parent species. The same applies to the artificial environments of spacecraft like “O’Neill Cylinders,” which are large cylindrical structures that rotate to produce artificial gravity. Insofar as future beings satisfy the basic conditions of evolution by natural selection—such as differential reproduction, heritability, and variation of traits across the population—then evolutionary pressures will yield new forms of life. But the process of “cyborgization”—that is, of using technology to modify and enhance our bodies and brains—is much more likely to influence the evolutionary trajectories of future populations living on exoplanets or in spacecraft. The result could be beings with completely novel cognitive architectures (or mental abilities), emotional repertoires, physical capabilities, lifespans, and so on. In other words, natural selection and cyborgization as humanity spreads throughout the cosmos will result in species diversification. At the same time, expanding across space will also result in ideological diversification. Space-hopping populations will create their own cultures, languages, governments, political institutions, religions, technologies, rituals, norms, worldviews, and so on. As a result, different species will find it increasingly difficult over time to understand each other’s motivations, intentions, behaviors, decisions, and so on. It could even make communication between species with alien languages almost impossible. Furthermore, some species might begin to wonder whether the proverbial “Other” is conscious. This matters because if a species Y cannot consciously experience pain, then another species X might not feel morally obligated to care about Y. After all, we don’t worry about kicking stones down the street because we don’t believe that rocks can feel pain. Thus, as I write in the paper, phylogenetic and ideological diversification will engender a situation in which many species will be “not merely aliens to each other but, more significantly, alienated from each other.” But this yields some problems. First, extreme differences like those just listed will undercut trust between species. If you don’t trust that your neighbor isn’t going to steal from, harm, or kill you, then you’re going to be suspicious of your neighbor. And if you’re suspicious of your neighbor, you might want an effective defense strategy to stop an attack—just in case one were to happen. But your neighbor might reason the same way: she’s not entirely sure that you won’t kill her, so she establishes a defense as well. The problem is that, since you don’t fully trust her, you wonder whether her defense is actually part of an attack plan. So you start carrying a knife around with you, which she interprets as a threat to her, thus leading her to buy a gun, and so on. Within the field of international relations, this is called the “security dilemma,” and it results in a spiral of militarization that can significantly increase the probability of conflict, even in cases where all actors have genuinely peaceful intentions. So, how can actors extricate themselves from the security dilemma if they can’t fully trust each other? On the level of individuals, one solution has involved what Thomas Hobbes’ calls the “Leviathan.” The key idea is that people get together and say, “Look, since we can’t fully trust each other, let’s establish an independent governing system—a referee of sorts—that has a monopoly on the legitimate use of force. By replacing anarchy with hierarchy, we can also replace the constant threat of harm with law and order.” Hobbes didn’t believe that this happened historically, only that this predicament is what justifies the existence of the state. According to Steven Pinker, the Leviathan is a major reason that violence has declined in recent centuries. The point is that if individuals—you and I—can overcome the constant threat of harm posed by our neighbors by establishing a governing system, then maybe future species could get together and create some sort of cosmic governing system that could similarly guarantee peace by replacing anarchy with hierarchy. Unfortunately, this looks unpromising within the “cosmopolitical” realm. One reason is that for states to maintain law and order among their citizens, their various appendages—e.g., law enforcement, courts—need to be properly coordinated. If you call the police about a robbery and they don’t show up for three weeks, then what’s the point of living in that society? You’d be just as well off on your own! The question is, then, whether the appendages of a cosmic governing system could be sufficiently well-coordinated to respond to conflicts and make top-down decisions about how to respond to particular situations. To put it differently: If conflict were to break out in some region of the universe, could the relevant governing authorities respond soon enough for it to matter, for it to make a difference? Probably not, because of the immense vastness of space. For example, consider again Epsilon Eridani b, Gliese 674 b, and Gliese 581 d. These are, respectively, 10.5, 14.8, and 20.4 light-years from Earth. This means that a signal sent as of this writing, in 2018, wouldn’t reach Gliese 581 d until 2038. A spaceship traveling at one-quarter the cosmic speed limit wouldn’t arrive until 2098, and a message to simply affirm that it had arrived safely wouldn’t return to Earth until 2118. And Gliese 581 is relatively close as far as exoplanets go. Just consider that the Andromeda Galaxy is some 2.5 million light-years from Earth and the Triangulum Galaxy about 3 million light-years away. What’s more, there are some 54 galaxies in our Local Group, which is about 10 million light-years wide, within a universe that stretches some 93 billion light-years across. These facts make it look hopeless for a governing system to effectively coordinate law enforcement activities, judicial decisions, and so on, across cosmic distances. The universe is simply too big for a government to establish law and order in a top-down fashion. But there is another strategy for achieving peace: Future civilizations could use a policy of deterrence to prevent other civilizations from launching first strikes. A policy of this sort, which must be credible to work, says: “I won’t attack you first, but if you attack me first, I have the capabilities to destroy you in retaliation.” This was the predicament of the US and Soviet Union during the Cold War, known as “mutually-assured destruction” (MAD). But could this work in the cosmopolitical realm of space? It seems unlikely. First, consider how many future species there could be: upwards of many billions. While some of these species would be too far away to pose a threat to each other—although see the qualification below—there will nonetheless exist a huge number within one’s galactic backyard. The point is that the sheer number would make it incredibly hard to determine who initiated a first strike, if one is attacked. And without a method for identifying instigators with high reliability, one’s policy of deterrence won’t be credible. And if one’s policy of deterrence isn’t credible, then one has no such policy! Second, ponder the sorts of weapons that could become available to future spacefaring civilizations. Redirected asteroids (a.k.a., “planetoid bombs”), “rods from God,” sun guns, laser weapons, and no doubt an array of exceptionally powerful super-weapons that we can’t currently imagine. It has even been speculated that the universe might exist in a “metastable” state and that a high-powered particle accelerator could tip the universe into a more stable state. This would create a bubble of total annihilation that spreads in all directions at the speed of light—which opens up the possibility that a suicidal cult, or whatever, weaponizes a particle accelerator to destroy the universe. The question, then, is whether defensive technologies could effectively neutralize such risks. There’s a lot to say here, but for the present purposes just note that, historically speaking, defensive measures have very often lagged behind offensive measures, thus resulting in periods of heightened vulnerability. This is an important point because when it comes to existentially dangerous super-weapons, one only needs to be vulnerable for a short period to risk annihilation. So far as I can tell, this seriously undercuts the credibility of policies of deterrence. Again, if species A cannot convince species B that if B strikes it, A will launch an effective and devastating counter strike, then B may take a chance at attacking A. In fact, B does not need to be malicious to do this: it only needs to worry that A might, at some point in the near- or long-term future, attack B, thus making it rational for B to launch a preemptive strike (to eliminate the potential danger). Thinking about this predicament in the radically multi-polar conditions of space, it seems fairly obvious that conflict will be extremely difficult to avoid.

#### **Extinction is not inevitable, but colonization makes it more likely**

Etzioni 18[Amitai Etzioni is a University Professor at The George Washington University and author, most recently, of Happiness is the Wrong Metric. “Humanity Would Be Better off Saving Earth, Rather Than Colonizing Mars,” <https://nationalinterest.org/blog/buzz/humanity-would-be-better-saving-earth-rather-colonizing-mars-29712>]

Recently, SpaceX held a top-secret “Mars Workshop” in Boulder, Colorado, to discuss what it would take to colonize Mars. Although the deliberations of the workshop were kept quiet, in the past SpaceX founder Elon Musk and other prominent figures, including renowned physicist Stephen Hawking, have stressed the importance of establishing a sustainable outpost of human civilization on the Red Planet. “If there’s a third world war we want to make sure there’s enough of a seed of human civilization somewhere else to bring it back and shorten the length of the dark ages,” according to Musk. Hawking believes that “[w]ith climate change, overdue asteroid strikes, epidemics and population growth, our own planet is increasingly precarious,” and that we must colonize a new planet in the next 100 years. “The Call of Mars” by Astronaut Buzz Aldrin advocates for a “comprehensive plan that would lead to permanent human settlement on Mars in the next 25 years.” Tim Urban, the writer behind the long-form blog Wait But Why, sums up the situation with the following metaphor: “[a]ll of our eggs are on one planet, let’s get life insurance for the species.” The mission to colonize Mars runs into three major challenges. First, likening a colony on Mars to life insurance is misleading. If the earth does overheat to the point that we all fry or becomes so polluted that we all choke, there will be no way to move the world’s population to Mars. Not even one child per family. Rather, the idea is that the survival of the human species will be ensured; the select few that go to Mars will survive, procreate, and gradually build a new population. Elon Musk’s most optimistic estimate is that SpaceX will transport one million people to Mars in the next 100 years. The proper analogy is to the United States' Cold War plan for nuclear warfare—to rush a few thousand "special" people to bunkers, leaving most of humanity to be nuked. Second, if the colonization of Mars moves beyond the subject of workshops and cocktail party chit-chat into a major project, it brings with it an unavoidable subtext of despair. Despite the fact that what Musk, Hawking, and others propose it as a backup plan, it suggests that we may well fail to save Mother Earth and that it is time to search for another planetary home, to save the species, even if not mankind. But what the droughts, the fires, the hot summers, and the melting glaciers call for is not an escape from Earth, but a redoubling of the efforts to save it. Some hold that the next decade is a critical period, as the window of opportunity to save the earth is rapidly narrowing. Others hold that we have more leeway. However, there is wide agreement that merely dialing down economic activity may be neither sufficient nor politically feasible. What is needed are major technological breakthroughs that will allow for protecting earth while sustaining a healthy level of economic activity. Developing artificial leaves, that can turn carbon dioxide into oxygen, and be mass-produced much more quickly than their natural counterparts, is a telling example. To make such breakthroughs we need major concentrations of research and development resources, talent, and leadership, all of which are in short supply. Hence, any serious Mars endeavor will inevitably cut into the drive to save Mother Earth. Even Elon Musk admits that colonizing Mars will require “tremendous entrepreneurial resources.” Musk and his team estimate that just sending the first twelve astronauts to Mars will cost $10 billion per person. A rocket that could transport astronauts to Mars remains to be invented. Once the astronauts do arrive on Mars, they will be confronted with an extremely hostile environment. The water that has been discovered is buried one mile below the surface, the air is saturated with toxic chemicals called perchlorates, and the Mars atmosphere does little to protect from damaging cosmic radiation. Some hold the water could be made to yield oxygen for breathing and hydrogen for fuel. However, first one would have to bring a drill from earth, then pumps, then build a plant to process the water. The same holds for most everything else. As Ellen Stofan, former chief scientist of NASA puts it, “There is no Planet B.” We object to the mission to colonize Mars. We believe that it is an incomplete solution to an unlikely contingency. The window of opportunity for us to work together to solve our planet’s most pressing problems is closing, and we must act before it is entirely shut

#### Colonization doesn’t reduce existential risk

**Szocik 19** [Konrad Szocik, University of Information Technology and Management in Rzeszow, Department of Philosophy and Cognitive Science. Should and could humans go to Mars? Yes, but not now and not in the near future. Futures Volume 105, January 2019, Pages 54-66. https://www.sciencedirect.com/science/article/pii/S001632871830199X]

I argue, following other authors (Baum, 2009; Baum, Denkenberger, & Haqq-Misra, 2015; Jebari, 2015; Sandberg, Matheny, & Ćirković, 2008; Turchin & Green, 2017) that human space settlement is not able to reduce and/or to exclude the risk of human extinction. For this reason, it should not be perceived in terms of space refuge. In terms of both short-term and long-term perspectives of risk assessment, it would be better to protect humans on Earth.5 I reject the supportive role which could be played by human space settlement after a catastrophe on Earth, i.e., a recovery coordination mission. Due to so-called the paradox of technological progress discussed in the last section, further putative progress in space technology will be counterbalanced by increasing anthropogenic risks including, among others, overpopulation and limited resources (these anthropogenic threats are unavoidable in near future, in contrast to other risks that are only more or less probable but not unavoidable). Permanent lack of strong rationale for human mission to Mars – both now and in the near future – leads to paradoxical situation. Even if in some point in the future the minimum level of advancement in human deep-space technologies will be achieved, social, political, and economic contexts will gradually decrease the chances for real preparation of this mission. Another paradox, let’s call it the risk dynamics paradox, is that the most probable threats in the near future are, as Bostrom and Cirkovic (2008) argue, anthropogenic threats caused by civilizational and technological progress. The paradox lies in the fact that humans are not able to run from these kinds of risks that are rooted in their way of thinking, style of life, and population dynamics, risks implied by Malthus’ law. The human species can try to protect against natural disaster but not against deleterious effects of its own technological progress. In regard to possible future existential risks, I assume that their deleterious power is a little bit exaggerated, and, in any event, human space settlement is not a right way to cope with them. However, in any case, it is hard to speculate if any human space settlement must repeat the same path of human expansion as it was the case on Earth. It is unclear if human technological expansion and exploration must always lead to deleterious and self-destructive effects. In this paper, I do not discuss ethical and moral concerns which are traditionally considered when discussing the human place in space. They include such topics as the human right to explore space (it means both right to intervene in any extraterrestrial object, and human duty and rationale for space expansionism, mostly in the context of the idea of space refuge and possible catastrophic scenarios on Earth), or the value of human life and space objects.

### Scenario 4 – Africa

#### Economic decline stops war—studies prove

Clary 15 – Christopher Clary, PhD in Political Science from MIT, M.A. in National Security Affairs, Brown University, 2015 (“Economic Stress and International Cooperation: Evidence from International Rivalries,” April 25th, <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2597712>) HAH

Do economic downturns generate pressure for diversionary conflict? Or might downturns encourage austerity and economizing behavior in foreign policy? This paper provides new evidence that economic stress is associated with conciliatory policies between strategic rivals. For states that view each other as military threats, the biggest step possible toward bilateral cooperation is to terminate the rivalry by taking political steps to manage the competition. Drawing on data from 109 distinct rival dyads since 1950, 67 of which terminated, the evidence suggests rivalries were approximately twice as likely to terminate during economic downturns than they were during periods of economic normalcy. This is true controlling for all of the main alternative explanations for peaceful relations between foes (democratic status, nuclear weapons possession, capability imbalance, common enemies, and international systemic changes), as well as many other possible confounding variables. This research questions existing theories claiming that economic downturns are associated with diversionary war, and instead argues that in certain circumstances peace may result from economic troubles Do economic downturns generate pressure for diversionary conflict? Or might downturns encourage austerity and economizing behavior in foreign policy? This paper provides new evidence that economic stress is associated with conciliatory policies between strategic rivals. For states that view each other as military threats, the biggest step possible toward bilateral cooperation is to terminate the rivalry by taking political steps to manage the competition. Drawing on data from 109 distinct rival dyads since 1950, 67 of which terminated, the evidence suggests rivalries were approximately twice as likely to terminate during economic downturns than they were during periods of economic normalcy. 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Rivalry termination is the transition from a state of rivalry to one where conflicts of interest are not viewed as being so severe as to provoke interstate conflict and/or where a mutual recognition of the imbalance in military capabilities makes conflict-causing bargaining failures Updated April 21, 2015 Clary 3 unlikely. In other words, rivalries terminate when the elites assess that the risks of military conflict between rivals has been reduced dramatically. This definition draws on a growing quantitative literature most closely associated with the research programs of William Thompson, J. Joseph Hewitt, and James P. Klein, Gary Goertz, and Paul F. Diehl.1 My definition conforms to that of William Thompson. In work with Karen Rasler, they define rivalries as situations in which “[b]oth actors view each other as a significant politicalmilitary threat and, therefore, an enemy.”2 In other work, Thompson writing with Michael Colaresi, explains further: The presumption is that decisionmakers explicitly identify who they think are their foreign enemies. They orient their military preparations and foreign policies toward meeting their threats. They assure their constituents that they will not let their adversaries take advantage. Usually, these activities are done in public. Hence, we should be able to follow the explicit cues in decisionmaker utterances and writings, as well as in the descriptive political histories written about the foreign policies of specific countries.3 Drawing from available records and histories, Thompson and David Dreyer have generated a universe of strategic rivalries from 1494 to 2010 that serves as the basis for this project’s empirical analysis.4 This project measures rivalry termination as occurring on the last year that Thompson and Dreyer record the existence of a rivalry.5 Why Might Economic Crisis Cause Rivalry Termination? Economic crises lead to conciliatory behavior through five primary channels. (1) Economic crises lead to austerity pressures, which in turn incent leaders to search for ways to cut defense expenditures. (2) Economic crises also encourage strategic reassessment, so that leaders can argue to their peers and their publics that defense spending can be arrested without endangering the state. This can lead to threat deflation, where elites attempt to downplay the seriousness of the threat posed by a former rival. (3) If a state faces multiple threats, economic crises provoke elites to consider threat prioritization, a process that is postponed during periods of economic normalcy. (4) Economic crises increase the political and economic benefit from international economic cooperation. Leaders seek foreign aid, enhanced trade, and increased investment from abroad during periods of economic trouble. This search is made easier if tensions are reduced with historic rivals. (5) Finally, during crises, elites are more prone to select leaders who are perceived as capable of resolving economic difficulties, permitting the emergence of leaders who hold heterodox foreign policy views. Collectively, these mechanisms make it much more likely that a leader will prefer conciliatory policies compared to during periods of economic normalcy. This section reviews this causal logic in greater detail, while also providing historical examples that these mechanisms recur in practice.

#### No China wars.

Thompson 17 – Timothy Heath, a senior international defense research analyst at the RAND Corporation. William R. Thompson, Political Science Professor at Indiana University. [U.S.-China Tensions Are Unlikely to Lead to War, https://www.rand.org/blog/2017/05/us-china-tensions-are-unlikely-to-lead-to-war.html]

Graham Allison's April 12 article, “How America and China Could Stumble to War,” explores how misperceptions and bureaucratic dysfunction could accelerate a militarized crisis involving the United States and China into an unwanted war. However, the article fails to persuade because it neglects the key political and geostrategic conditions that make war plausible in the first place. Without those conditions in place, the risk that a crisis could accidentally escalate into war becomes far lower. The U.S.-China relationship today may be trending towards greater tension, but the relative stability and overall low level of hostility make the prospect of an accidental escalation to war extremely unlikely.

In a series of scenarios centered around the South China Sea, Taiwan and the East China Sea, Allison explored how well-established flashpoints involving China and the United States and its allies could spiral into unwanted war. Allison’s article argues that given the context of strategic rivalry between a rising power and a status-quo power, organizational and bureaucratic misjudgments increase the likelihood of unintended escalation. According to Allison, “the underlying stress created by China’s disruptive rise creates conditions in which accidental, otherwise inconsequential events could trigger a large-scale conflict.” This argument appears persuasive on its surface, in no small part because it evokes insights from some of Allison’s groundbreaking work on the organizational pathologies that made the Cuban Missile Crisis so dangerous.

However, Allison ultimately fails to persuade because he fails to specify the political and strategic conditions that make war plausible in the first place. Allison’s analysis implies that the United States and China are in a situation analogous to that of the Soviet Union and the United States in the early 1960s. In the Cold War example, the two countries faced each other on a near-war footing and engaged in a bitter geostrategic and ideological struggle for supremacy. The two countries experienced a series of militarized crises and fought each other repeatedly through proxy wars. It was this broader context that made issues of misjudgment so dangerous in a crisis.

By contrast, the U.S.-China relationship today operates at a much lower level of hostility and threat. China and the United States may be experiencing an increase in tensions, but the two countries remain far from the bitter, acrimonious rivalry that defined the U.S.-Soviet relationship in the early 1960s. Neither Washington nor Beijing regards the other as its principal enemy. Today’s rivals may view each other warily as competitors and threats on some issues, but they also view each other as important trade partners and partners on some shared concerns, such as North Korea, as the recent summit between President Donald Trump and Chinese president Xi Jinping illustrated. The behavior of their respective militaries underscores the relatively restrained rivalry. The military competition between China and the United States may be growing, but it operates at a far lower level of intensity than the relentless arms racing that typified the U.S.-Soviet standoff. And unlike their Cold War counterparts, U.S. and Chinese militaries are not postured to fight each other in major wars. Moreover, polls show that the people of the two countries regard each other with mixed views—a considerable contrast from the hostile sentiment expressed by the U.S. and Soviet publics for each other. Lacking both preparations for major war and a constituency for conflict, leaders and bureaucracies in both countries have less incentive to misjudge crisis situations in favor of unwarranted escalation.

To the contrary, political leaders and bureaucracies currently face a strong incentive to find ways of defusing crises in a manner that avoids unwanted escalation. This inclination manifested itself in the EP-3 airplane collision off Hainan Island in 2001, and in subsequent incidents involving U.S. and Chinese ships and aircraft, such as the harassment of the USNS Impeccable in 2009. This does not mean that there is no risk, however. Indeed, the potential for a dangerous militarized crisis may be growing. Moreover, key political and geostrategic developments could shift the incentives for leaders in favor of more escalatory options in a crisis and thereby make Allison’s scenarios more plausible. Past precedents offer some insight into the types of developments that would most likely propel the U.S.-China relationship into a hostile, competitive one featuring an elevated risk of conflict.

The most important driver, as Allison recognizes, would be a growing parity between China and the United States as economic, technological and geostrategic leaders of the international system. The United States and China feature an increasing parity in the size of their economies, but the United States retains a considerable lead in virtually every other dimension of national power. The current U.S.-China rivalry is a regional one centered on the Asia-Pacific region, but it retains the considerable potential of escalating into a global, systemic competition down the road. A second important driver would be the mobilization of public opinion behind the view that the other country is a primary source of threat, thereby providing a stronger constituency for escalatory policies. A related development would be the formal designation by leaders in both capitals of the other country as a primary hostile threat and likely foe. These developments would most likely be fueled by a growing array of intractable disputes, and further accelerated by a serious militarized crisis. The cumulative effect would be the exacerbation of an antagonistic competitive rivalry, repeated and volatile militarized crisis, and heightened risk that any flashpoint could escalate rapidly to war—a relationship that would resemble the U.S.-Soviet relationship in the early 1960s.

Yet even if the relationship evolved towards a more hostile form of rivalry, unique features of the contemporary world suggest lessons drawn from the past may have limited applicability. Economic interdependence in the twenty-first century is much different and far more complex than in it was in the past. So is the lethality of weaponry available to the major powers. In the sixteenth century, armies fought with pikes, swords and primitive guns. In the twenty-first century, it is possible to eliminate all life on the planet in a full-bore nuclear exchange. These features likely affect the willingness of leaders to escalate in a crisis in a manner far differently than in past rivalries.

More broadly, Allison’s analysis about the “Thucydides Trap” may be criticized for exaggerating the risks of war. In his claims to identify a high propensity for war between “rising” and “ruling” countries, he fails to clarify those terms, and does not distinguish the more dangerous from the less volatile types of rivalries. Contests for supremacy over land regions, for example, have historically proven the most conflict-prone, while competition for supremacy over maritime regions has, by contrast, tended to be less lethal. Rivalries also wax and wane over time, with varying levels of risks of war. A more careful review of rivalries and their variety, duration and patterns of interaction suggests that although most wars involve rivalries, many rivals avoid going to war.

### Space Col

#### Mining is key to space col – there is a trade off

Jayshree Pandya May 13, 2019. Contributor to AI and Big Data for Forbes. "The Race to Mine Space," Forbes, https://www.forbes.com/sites/cognitiveworld/2019/05/13/the-race-to-mine-space/#7f35f0591a70

Introduction As our planet contends with resource scarcity, a potential solution can be found by traversing the great unknown -- outer space. Metals, minerals, and energy sources have been found to exist in near-infinite quantities within our [solar system,](https://oilprice.com/Metals/Commodities/Mining-the-Infinite-Resources-of-Space.html) and political and commercial interest in space mining is [grow](https://www.space.com/41707-space-mining-usgs-resource-survey.html)ing as the concept is increasingly becoming realistic and achievable. In 2017, [a feasibility study](https://pubs.usgs.gov/of/2017/1041/ofr20171041.pdf) by Laszlo Kestay, a research geologist at the U.S. Geological Survey’s Astrogeology Science Center, found that the projected water and metal resources of near-Earth asteroids is “*immense when compared to current needs…[the projections] could sustain a million-fold increase in human activity in space for a million years.*” The U.S. Geological Survey is actively working on developing the methodology for space resource assessments, which would provide much-needed information to guide policy and investment decisions in the not-too-distant future. Key questions remain regarding the technology required to conduct space mining and the policies that will govern this new frontier. Acknowledging this emerging reality, [Risk Group](https://www.riskgroupllc.com/) initiated a much-needed discussion on Space Mining with Daniel Faber, a Pioneer of Space Technologies and Mining, on [Risk Roundup](https://itunes.apple.com/us/podcast/risk-roundup/id1041763748?mt=2). The Next Gold Rush Serious plans are being made for the mining of the moon and nearby asteroids using smart [autonomous robots](https://spectrum.ieee.org/automaton/robotics/military-robots/nasa-training-swarmie-robots-for-space-mining) and [humans](https://www.independent.co.uk/news/science/china-nasa-asteroid-space-agency-beijing-a7732306.html). At the top of the mining resource list is the exploration of water, which is a prerequisite for keeping a space colony alive; without water, there is no way to move forward with space exploration. In addition, water could also be broken down into hydrogen and oxygen to form rocket engine fuel. Blue Origin/Amazon CEO Jeff Bezos recently [announced](https://www.theatlantic.com/science/archive/2019/05/jeff-bezos-moon-nasa/589150/) plans to extract water from the moon, which would allow for greater access to hydrogen, carbon, silicon, metals, and other critical materials. Bezos’ announcement highlights the massive economic opportunity ahead of us -- what some are referring to as the [next gold rush](https://www.sciencefocus.com/space/space-mining-the-new-goldrush/). One NASA report estimates that the mineral wealth of the asteroids is in the [quadrillions](https://globalnews.ca/news/3175097/nasa-plans-mission-to-a-metal-rich-asteroid-worth-quadrillions/).