## T

#### Interpretation: An OUF is not a form of appropriation. The affirmative must defend that the appropriation of space by private entities is unjust.

Violation: the aff

#### 1] Neg Ground – that allows them to no link all das since there is no difference in what is allowed between the aff and the squo. 1AC Runnels proves abuse since they tag it to say the industry is not harmed at all. We can’t generate Das by saying appropriation disincentives anything which is key to every disad. The aff doesn’t ban satellites which takes out every da/pic specific to satellites, skirts links to innovation DAs, heg DAs based on private sector being key to space since they do’

#### 2] Semantics – The aff fiats on OUF which then FUNDS debris removal. At best they are extra topical AND effects topical since 1AC evidence says the fee also goes towards research (not appropriation) and the debris removal isn’t fiated it’s a consequence of the plan.

Runnels 22. Michael is a professor and writer for the American Bar Association. 1/13/22. [American Bar Association “On Clearing Earth’s Orbital Debris & Enforcing the Outer Space Treaty in the U.S.” <https://www.americanbar.org/groups/business_law/publications/blt/2022/01/orbital-debris/>] Justin **\*\*OUF: Proportional fee for amount of debris put into Space**

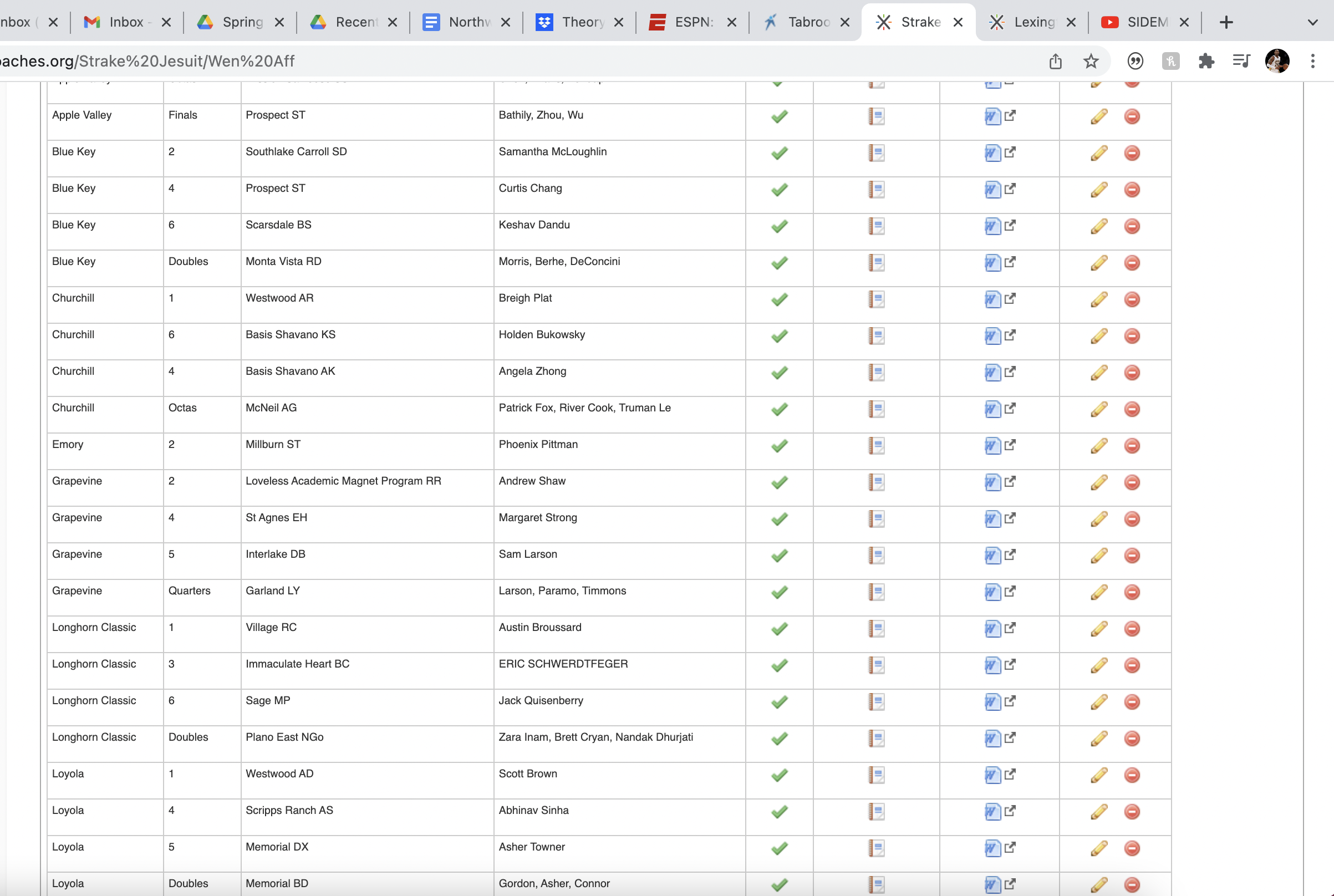
A number of technological and regulatory solutions, such as active debris removal[119] and voluntary orbital debris mitigation guidelines,[120] are currently being explored by regulatory authorities.[121] While these efforts are important in ensuring the sustainable use of LEO orbits, they do not address the underlying incentive problem for satellite operators. Namely, they are incentivized to view both their orbital debris and the costs that it imposes on others as externalities.[122] As such, without the internalization of these externalities, efforts to fully address the orbital debris problem will likely be ineffective.[123] Notably, a National Academy of Sciences study found that orbital debris removal may worsen the economic damages from congestion by increasing incentives to launch.[124] As satellite operators are prohibited from securing exclusive property rights to orbital shells under the OST,[125] and are unlikely to recover economic damages resulting from orbital debris collisions under the Liability Convention,[126] prospective operators “face a choice between launching profitable satellites, thereby imposing current and future collision risk on others, or not launching and leaving those profits to competitors.”[127] This dynamic represents a classic tragedy of the commons problem.[128] However, under Article VI of the OST,[129] this problem can be partially solved through an OUF[130] levied by the FCC. The monies received from this fee would then be used to fund private orbital debris clearing projects[131] and research related to orbital debris removal.

#### Massively explodes limits, makes literally any aff topical because they can just tack extra planks onto the aff to solve for a DA or CP which makes it impossible to negate

## RR

#### Interp: Debaters must disclose round reports on the 2021-2022 NDCA LD wiki for every round they have debated this season. Round reports disclose which positions (AC, NC, K, T, Theory, etc.) were read/gone for in every speech.

#### Violation: screenshot in the doc – they have none for several rounds at this tourney



#### 1] Level Playing Field – big schools can go around and scout and collect flows but independents are left in the dark so round reports are key for them to prep- they give you an idea of overall what layers debaters like going for so you can best prepare your strategy when you hit them. Accessibility first and independent voter – it's an impact multiplier.

#### 2] Strategy Education – round reports help novices understand the context in which positions are read by good debaters and help with brainstorming potential 1NCs vs affs – helps compensate for kids who can't afford coaches to prep out affs.

#### 3] Pre-round prep –1ARs gives especially give an idea of what type of debater someone is – they could go for 1AR theory every round– otherwise I enter every round unknowing whereas you have an idea of what you want to go for from the start.

#### Fairness- consittutive of comp activites, args presume

#### Edu- funded ny schools

#### DTD- time skew, deter abuse

#### No RVI’s- illogical, baiting

#### CI- intervention, race to bottom, collapses, yours vs best

## Heg DA

#### US wins space race now due to private competition – its key to space dominance and militarization is good – the plan nukes the US’s silver bullet against Chinese aggression

Weichert 21 – former Congressional staff member who holds a Master of Arts in Statecraft & National Security Affairs from the Institute of World Politics in Washington, D.C. He is the founder of The Weichert Report: An Online Journal of Geopolitics [Brandon, “The Future of Space Exploration Depends on the Private Sector,” 7/5/2021, https://www.nationalreview.com/2021/07/the-future-of-space-exploration-depends-on-the-private-sector/#slide-1]

As Jeff Bezos, the wealthiest man on the planet, readies to launch himself into space aboard one of his own rockets, the world is watching the birth of a new dawn in space. Previously, America relied on its government agency, NASA, to propel it to the cosmos during the last space race with the Soviet Union. Today, America’s greatest hopes are with its private sector.

Jeff Bezos is not engaging in such risky behavior simply because he’s an adrenaline junky. No, he’s launching himself into orbit because his Blue Origins is in a titanic struggle with Elon Musk’s SpaceX — and Bezos’s firm is losing.

Whatever happens, the American people will benefit from the competition that is shaping up between America’s space entrepreneurs. This has always been how innovation occurs: through the dynamic, often cutthroat competition between actors in the private sector. While money is their ultimate prize, fame and fortune are also alluring temptations to make men like Musk and Bezos risk much of their wealth to change the world.

The private space race among these entrepreneurs is part of a far more important marathon between Red China and the United States. Whichever nation wins the new space race will determine the future of the earth below.

Consider this: Since winning its initial contracts to launch sensitive U.S. military satellites into orbit, SpaceX has lowered the cost of military satellite launches on taxpayers by “over a million dollars less” than what bigger defense contractors can do. Elon Musk is convinced that he can bring these costs down even more, thanks to his reusable Falcon 9 rocket.

The competition between the private space start-ups is fierce — just as the competition between Edison and Westinghouse was — but the upshot is ultimately greater innovation and lower costs for you and me. In fact, Elon Musk insists that if NASA gives SpaceX the contract for building the Human Landing System for the Artemis mission, NASA would return astronauts to the lunar surface by 2024 — four years before NASA believes it will do so. (Incidentally, 2024 is also when China anticipates having a functional base on the moon’s southern pole.)

Whereas China has an all-of-society approach to its space race with the United States, Washington has yet to fully galvanize the country in the way that John F. Kennedy rallied America to wage — and win — the space race in the Cold War. America’s private sector, therefore, is the silver bullet against China’s quest for total space dominance. If left unrestricted by meddlesome Washington bureaucrats, these companies will ensure that the United States retains its overall competitive advantage over China — and all other challengers, for that matter.

Indeed, the next four years could prove decisive in who will be victorious.

Enter the newly minted NASA director, Bill Nelson, whose station at the agency has effectively poured cold water on the private sector’s ambitious space plans. “Space is not going to be the Wild West for billionaires or anyone else looking to blast off,” Nelson admonished an inquiring reporter.

Why not?

America’s actions during its western expansion created a dynamic and advanced nation that was well-positioned to dominate the world for the next century. Should we not attempt to emulate this in order to remain dominant in the next century?

More important, this is precisely how China treats space: as a new Wild West . . . but one in which Beijing’s forces will dominate. China takes a leap-without-looking approach to space development — everything that can be done to further its grand ambition of becoming the world’s most dominant power by 2049 will be done. Meanwhile, the Biden administration wants to prevent America’s greatest strength, the free market, from helping to beat its foremost geopolitical competitor.

Nelson’s comments are fundamentally at odds with America’s spirit and animating principles. Whatever one’s opinion about Bezos or Musk, the fact is that their private space companies are inspiring greater innovation today in the space sector after years of its being left in the sclerotic hands of the U.S. government.

Sensing that the federal government’s dominance of U.S. space policy is waning, the Biden administration would rather cede the strategic high ground of space to China than let wildcatting innovators do the hard work. Today, the Federal Aviation Authority (FAA) and NASA are contriving new ways for strangling the budding private space sector, just as it is taking flight.

Risk aversion is not how one innovates. Risk is what led Americans to the moon just 66 years after the Wright brothers flew their first airplane. A willingness for risk doesn’t exist today in the federal government — which is why the feds shouldn’t be running space policy.

The U.S. government should be partnering with the new space start-ups, not shunning them. The FAA should be automatically approving SpaceX launches, not stymying them. The federal government will not win space any more than it could win the West or build the locomotive. It takes strong-willed, brilliant individuals of a rare caliber to do that. All government can do is to give the resources and support to private-sector innovators and let them make history for us.

The next decade will decide who wins space. Let it be America — and let America’s dynamic start-ups win that race, not China’s state capitalism.

#### And, space dominance key to global peace – nuclear and conventional deterrence is collapsing, which will provoke civilization-ending revisionist aggression from Russia and China

Dr. Robert Zubrin 19, Masters in Aeronautics and Astronautics and Ph.D. in Nuclear Engineering from the University of Washington, President of Pioneer Energy, Founder and President of the Mars Society, Senior Fellow with the Center for Security Policy, The Case for Space: How the Revolution in Spaceflight Opens Up a Future of Limitless Possibility, p. Google Books

The United States needs a new national security policy. For the first time in more than 60 years, we face the real possibility of a large-scale conventional war, and we are woefully unprepared.

Eastern and Central Europe is now so weakly defended as to virtually invite invasion. The United States is not about to go to nuclear war to defend any foreign country. So deterrence is dead, and, with the German army cut from 12 divisions to three, the British gone from the continent, and American forces down to a 30,000-troop tankless remnant, the only serious and committed ground force that stands between Russia and the Rhine is the Polish army. It’s not enough. Meanwhile, in Asia, the powerful growth of the Chinese economy promises that nation eventual overwhelming numerical force superiority in the region.

How can we restore the balance, creating a sufficiently powerful conventional force to deter aggression? It won’t be by matching potential adversaries tank for tank, division for division, replacement for replacement. Rather, the United States must seek to totally outgun them by obtaining a radical technological advantage. This can be done by achieving space supremacy.

To grasp the importance of space power, some historical perspective is required. Wars are fought for control of territory. Yet for thousands of years, victory on land has frequently been determined by dominance at sea. In the 20th century, victory on both land and sea almost invariably went to the power that controlled the air. In the 21st century, victory on land, sea or in the air will go to the power that controls space.

The critical military importance of space has been obscured by the fact that in the period since the United States has had space assets, all of our wars have been fought against minor powers that we could have defeated without them. Desert Storm has been called the first space war, because the allied forces made extensive use of GPS navigation satellites. However, if they had no such technology at their disposal, the end result would have been just the same. This has given some the impression that space forces are just a frill to real military power — a useful and convenient frill perhaps, but a frill nevertheless.

But consider how history might have changed had the Axis of World War II possessed reconnaissance satellites — merely one of many of today’s space-based assets — without the Allies having a matching capability. In that case, the Battle of the Atlantic would have gone to the U-boats, as they would have had infallible intelligence on the location of every convoy. Cut off from oil and other supplies, Britain would have fallen. On the Eastern front, every Soviet tank concentration would have been spotted in advance and wiped out by German air power, as would any surviving British ships or tanks in the Mediterranean and North Africa. In the Pacific, the battle of Midway would have gone very much the other way, as the Japanese would not have wasted their first deadly airstrike on the unsinkable island, but sunk the American carriers instead. With these gone, the remaining cruisers and destroyers in Adm. Frank Jack Fletcher’s fleet would have lacked air cover, and every one of them would have been hunted down and sunk by unopposed and omniscient Japanese air power. With the same certain fate awaiting any American ships that dared venture forth from the West Coast, Hawaii, Australia and New Zealand would then have fallen, and eventually China and India as well. With a monopoly of just one element of space power, the Axis would have won the war.

But modern space power involves far more than just reconnaissance satellites. The use of space-based GPS can endow munitions with 100 times greater accuracy, while space-based communications provide an unmatched capability of command and control of forces. Knock out the enemy’s reconnaissance satellites and he is effectively blind. Knock out his comsats and he is deaf. Knock out his navsats and he loses his aim. In any serious future conventional conflict, even between opponents as mismatched as Japan was against the United States — or Poland (with 1,000 tanks) is currently against Russia (with 12,000) — it is space power that will prove decisive.

Not only Europe, but the defense of the entire free world hangs upon this matter. For the past 70 years, U.S. Navy carrier task forces have controlled the world’s oceans, first making and then keeping the Pax Americana, which has done so much to secure and advance the human condition over the postwar period. But should there ever be another major conflict, an adversary possessing the ability to locate and target those carriers from space would be able to wipe them out with the push of a button. For this reason, it is imperative that the United States possess space capabilities that are so robust as to not only assure our own ability to operate in and through space, but also be able to comprehensively deny it to others.

*Space superiority* means having better space assets than an opponent. Space supremacy means being able to assert a complete monopoly of such capabilities. The latter is what we must have. If the United States can gain space supremacy, then the capability of any American ally can be multiplied by orders of magnitude, and with the support of the similarly multiplied striking power of our own land- and sea-based air and missile forces be made so formidable as to render any conventional attack unthinkable. On the other hand, should we fail to do so, we will remain so vulnerable as to increasingly invite aggression by ever-more-emboldened revanchist powers.

For this reason, both Russia and China have been developing and actively testing antisatellite (ASAT) systems. Up till now, the systems they have been testing have been ground launched, designed to orbit a few times and then collide with and destroy targets below one thousand kilometers altitude. This is sufficient to take out our reconnaissance satellites but not our GPS and communications satellites, which fly at twenty thousand and thirty-six thousand kilometers respectively. However, the means to reach these are straightforward, and, given their critical importance to us, there is every reason to believe that such development is well underway.11

The Obama administration sought to dissuade adversaries from developing ASATs by setting a good example and not working on them ourselves. This approach has failed. As a consequence, many defense policy makers are now advocating that we move aggressively to develop ASATs of our own. While more hardheaded than the previous policy, such an approach remains entirely inadequate to the situation.

The United States armed forces are far more dependent upon space assets than any potential opponent. Were both sides in a conflict able to destroy the space assets of the other, we would be the overwhelming loser by the exchange.

#### Space dominance solves hegemony – deterrence strategies, even rudimentary ones, are perceived as weakness and causes aggression

Weichert 17 (Brandon J. Weichert. Brandon J. Weichert is a former Congressional staff member who holds a Master of Arts in Statecraft & National Security Affairs from the Institute of World Politics in Washington, D.C. He is the founder of The Weichert Report: An Online Journal of Geopolitics, “The High Ground: The Case for U.S. Space Dominance,” Orbis, Vol 61, Issue 2, 2017, pp 227 – 237, <https://www.sciencedirect.com/science/article/pii/S0030438717300108>)

While space superiority and space dominance share a militarized view of space, there are fundamental differences in their stated end goals. Those who favor space superiority view space as a global commons, accessible to all in peacetime. They take a more defensive and reactive view of space and the actors who seek access to this domain. The space superiority model understands that U.S. dependence on space is vital for the basic functioning of American civilization (banking transactions, cell phone signals, GPS functions, television broadcasts, as well as essential military surveillance and support functions all across satellites in space). Yet, this model also accepts that current budgetary constraints mean that the United States is unlikely to invest significantly more into unwieldy and expensive space systems.

A strategy of space superiority accepts the risk arising from reliance on space systems, while deterring attacks on space assets. As actors such as China or Russia become increasingly dependent on space systems themselves, space superiority advocates believe that U.S. willingness to retaliate in kind against any attack on its own space assets is sufficient.7 This is in keeping with the classic deterrence model of Mutual Assured Destruction (MAD).

Unfortunately, however, U.S. dependence on space assets for its very survival is so much greater than any other state that such a threat is unrealistic. The reason that states like China or Russia are developing counter-space capabilities is because the cost to them is extremely low, whereas the benefit for them (in the event of war with the United States) is high. For the cost of a ground-based laser or an anti-satellite (ASAT) missile launcher, China could knock out the ability of all U.S. forces in the Pacific to coordinate and adequately defend themselves from a Chinese offensive.

What could the United States do to the Chinese in return? The best option for U.S. retaliation in space would be to launch some blinding attacks on the handful of China's space assets. However, this ultimately would not deter China from escalating any future conflict since China's investment in space is so low compared to that of the United States. In addition, since Chinese forces are designed to operate in an environment without those assets, such retaliation grounded on deterrence-based models becomes highly problematic and ineffective.

Rather than serving as a stabilizing force in space, then, the defensive and reactive space superiority model would be an inducement for conflict in the strategic high ground of space. Or, rather, the direction of attack would be unidirectional: from U.S. adversaries toward essential U.S. space systems. Thus, while space confers unequivocal advantages to the U.S. forces that depend on space assets for their vital functions, it also provides adversaries with an unprecedented weakness for them to exploit.

The fact is that United States, China, or Russia's dependence on space is asymmetrical. Over the long run, a deterrent-based, space superiority model would eventually allow other states not only to gain and maintain access to space, but also effectively to gain strategic parity with the United States in space. Make no mistake, the more that states are able to access space, no matter how nascent or rudimentary their space programs may be, the more they will refine their capabilities and be able to develop space programs for their own strategic ends. While most defense analysts believe that deterrence during the Cold War led to bipolar stability, a deterrence-based model in space would create instability. If a near-peer competitor like China or Russia believed that it had acquired the capacity to achieve parity with the United States, what would stop that state from trying to gain strategic advantage over America in space?

A Hegemonic Model

The best solution to avoid this situation is a hegemonic model. The only way that the United States can ensure its continued strategic advantage in space is to embrace fully the space dominance model by weaponizing space. While space superiority advocates will denounce this policy as both cost-ineffective and destabilizing, a hegemonic approach to space is far more in keeping with U.S. traditions and values. Indeed, as John Lewis Gaddis asserts, the American response to foreign threat is traditionally to take “the offensive, by becoming more conspicuous, by confronting, neutralizing, and if possible overwhelming the sources of danger rather than fleeing from them. Expansion, we have assumed, is the path to security.”8

What of the claim that a deterrence-based space superiority model creates stability? The primary claim of deterrence efficacy is that during the Cold War, the more or less equal nuclear balance ensured that neither side had an incentive to launch a disarming first strike. This view was the basis of the mutual assured destruction theory. Since there was no conceivable advantage to either side from these weapons, both sides were forced into a more constructive diplomatic relationship. In all of the time that deterrence was employed, American policymakers assured the public that MAD was better than the alternatives—compellence,9 Rollback,10 and hegemony—because it restrained Soviet aggression.

American policymakers assumed that the Soviet strategists in the Kremlin viewed nuclear arms in the same apocalyptic terms that they did. As such, U.S. policymakers were not only content to allow American nuclear dominance to erode, but also to degrade actively those capabilities through strategic arms agreements. In the meantime, until 1986, mainstream Soviet strategists and policymakers were convinced that they could prevail in a nuclear war. They were just biding their time.11

In this light then, deterrence was not built around the concept of enlightened self-interest, but more likely the result of U.S. policymakers’ inability to see through the fog of the Cold War. The Soviets were by definition a revolutionary power. Even after they had renounced the concept of spreading global communist revolution, however, the urge to transform fundamentally the world order to reflect their own image remained a high strategic priority for the USSR. The United States failed to discern this situation until the Reagan Administration.

President Ronald Reagan, rather than accept the Cold War deterrence paradigm, planned to bring American technical and strategic dominance to bear in space in order to help defeat the Soviet Union. Reagan also recognized that the demilitarized sanctuary view of space was irrelevant, and he eschewed arms control agreements that sought to counteract the inherent American advantages in space. President Reagan not only embraced a militarized view of space, but in 1983, he also called for the weaponization of space with his Strategic Defense Initiative (SDI).

By the 1980s, the United States was becoming increasingly dependent on space for military purposes (primarily in the area of satellites). These space systems formed the backbone of the modern military force that Reagan was assembling to counter the Soviet Union. What is more, Reagan's preferred strategy of Rollback meant that the United States would no longer sacrifice its own strategic advantages on the altar of diplomacy. After all, Reagan did not accept the Soviets as an equal and legitimate global power. He detested communism and viewed its proponents in the USSR as the great villains on the world stage. Furthermore, Reagan was staunchly opposed to nuclear weapons. Therefore, he sought to remove the notion of deterrence through MAD and replace it with the concept of hegemony through “Mutual Assured Survival.”

These views coalesced into the Reagan Administration's commitment to placing missile defense systems in orbit. It also called for developing new technologies (i.e., directed-energy weapons) to be used in space. The United States would not only remove the threat of the Soviet nuclear arsenal by creating a working missile defense system in space, but it would also move beyond the Soviet threat by permanently dominating the high ground of space. This position was the basis of SDI.12 In fact, the Reagan Administration's shift in focus was a key factor in the collapse of the Soviet Union as the Soviet leadership then embarked on a tit-for-tat arms buildup that their economy simply could not sustain. 13

Even if deterrence did facilitate a significant reduction in hostility—thereby creating the bipolar stability—no such hope for stability exists in space today. As argued earlier, U.S. reliance on space assets for its most basic functions is far greater than that of other countries. Furthermore, there is no way that the United States can—or should—abandon its use of space as a strategic domain. Thus, a hegemonic model for space dominance is the only hope to create the stability that most planners seek, while at the same time defending the American position in space.

Space dominance as a model for stability is nothing new. Indeed, Hegemonic Stability Theory (HST) asserts that the most stable global systems are those in which one actor dominates the system. In such a system, power is aggregated so greatly into a single, dominant actor that such a hegemonic power acts as a stabilizing force. Due to its relative strength, the hegemonic power can set the agenda and the rules that govern the system. The relative weakness of the other actors in the system is well understood, which then prompts these weak actors to abandon any hope of challenging the hegemonic power's rule. Eventually, they end up accommodating the hegemonic power. The lack of challenge creates peaceful stability.14 The fact that one actor is setting the rules means that the system is simple to operate in, as well.

The same logic that buttresses the HST international relations theory arguably undergirds the military strategy of space dominance. If this claim is so, then American hegemony in space is essential for the continued survival of the United States. Whereas there are legitimate arguments to be made regarding the reliance on deterrence-based models for creating stability during the Cold War, the fact is that the world is more multipolar today than it was 25 years ago. Despite what writer Fareed Zakaria has dubbed “the rise of the rest,”15 the United States still retains greater relative power. Therefore, it is inevitable and logical that the United States should expand its hegemonic position in space, in order to secure its place there.

Whereas deterrence-based models, such as space superiority, may have worked in a less chaotic international system, no such stability can be achieved today. Many of America's competitors are revanchist states intent on redefining the world order. They are not interested in preserving the American position in space. Also, they are not cowed by a U.S. deterrence strategy in space. Rather, they view such a policy as a concession that the United States is becoming weaker.

Space dominance would create greater stability than space superiority. Missile defense systems, tungsten rods, and even directed-energy weapons potentially would all be placed in key orbits around the Earth. This, on top of the existing U.S. space infrastructure, would prove to the world that the United States is committed to preserving its position in space. In a world of rogue states, space-based weapons likely would prevent surprise nuclear attacks. Failing that, the fact that the United States possessed strategic, offensive weapons in orbit—that could be brought down against any hostile actor—undoubtedly, would make even the most intractable foe hesitant.

It is arguable that overwhelming U.S. space power would trickle down from the strategic high ground to lower strategic domains. Rather than wasting time demonstrating resolve by “temporarily blinding Chinese satellites,”16 for example, the overwhelming American presence in space presumably would dissuade potential attackers.

#### US hegemony prevents great-power conflicts that escalates to nuclear war

Brands and Edel 19 (Hal Brands and Charles Edel. Hal Brands is the Henry Kissinger Distinguished Professor of Global Affairs in the Johns Hopkins School of Advanced International Studies and a scholar at the American Enterprise Institute. Charles Edel is a senior fellow at the United States Studies Centre at the University of Sydney and previously served on the U.S. Secretary of State’s policy planning staff, “Rediscovering Tragedy. In The Lessons of Tragedy: Statecraft and World Order; Chapter 6: The Darkening Horizon,” Yale University Press, pp 128-131 <http://www.jstor.org/stable/j.ctvbnm3r9.11>)

Each of these geopolitical challenges is different, and each reflects the distinctive interests, ambitions, and history of the country undertaking it. Yet there is growing cooperation between the countries that are challenging the regional pillars of the U.S.-led order. Russia and China have collaborated on issues such as energy, sales and development of military technology, opposition to additional U.S. military deployments on the Korean peninsula, and military exercises from the South China Sea to the Baltic. In Syria, Iran provided the shock troops that helped keep Russia’s ally, Bashar al-Assad, in power, as Moscow provided the air power and the diplomatic cover. “Our cooperation can isolate America,” supreme leader Ali Khamenei told Putin in 2017. 34 More broadly, what links these challenges together is their opposition to the constellation of power, norms, and relationships that the U.S.-led order entails, and in their propensity to use violence, coercion, and intimidation as means of making that opposition effective. Taken collectively, these challenges constitute a geopolitical sea change from the post– Cold War era.

The revival of great-power competition entails higher international tensions than the world has known for decades, and the revival of arms races, security dilemmas, and other artifacts of a more dangerous past. It entails sharper conflicts over the international rules of the road on issues ranging from freedom of navigation to the illegitimacy of altering borders by force, and intensifying competitions over states that reside at the intersection of rival powers’ areas of interest. It requires confronting the prospect that rival powers could overturn the favorable regional balances that have underpinned the U.S.-led order for decades, and that they might construct rival spheres of influence from which America and the liberal ideas it has long promoted would be excluded. Finally, it necessitates recognizing that great-power rivalry could lead to great-power war, a prospect that seemed to have followed the Soviet empire onto the ash heap of history.

Both Beijing and Moscow are, after all, optimizing their forces and exercising aggressively in preparation for potential conflicts with the United States and its allies; Russian doctrine explicitly emphasizes the limited use of nuclear weapons to achieve escalation dominance in a war with Washington.35 In Syria, U.S. and Russian forces even came into deadly contact in early 2018. American airpower decimated a contingent of government-sponsored Russian mercenaries that was attacking a base at which U.S. troops were present, an incident demonstrating the increasing boldness of Russian operations and the corresponding potential for escalation.36 The world has not yet returned to the epic clashes for global dominance that characterized the twentieth century, but it has returned to the historical norm of great-power struggle, with all the associated dangers.

Those dangers may be even greater than most observers appreciate, because if today’s great-power competitions are still most intense at the regional level, who is to say where these competitions will end? By all appearances, Russia does not simply want to be a “regional power” (as Obama cuttingly described it) that dominates South Ossetia and Crimea.37 It aspires to the deep European and extra-regional impact that previous incarnations of the Russian state enjoyed. Why else would Putin boast about how far his troops can drive into Eastern Europe? Why else would Moscow be deploying military power into the Middle East? Why else would it be continuing to cultivate intelligence and military relationships in regions as remote as Latin America?

Likewise, China is today focused primarily on securing its own geopolitical neighborhood, but its ambitions for tomorrow are clearly much bolder. Beijing probably does not envision itself fully overthrowing the international order, simply because it has profi ted far too much from the U.S.-anchored global economy. Yet China has nonetheless positioned itself for a global challenge to U.S. influence. Chinese military forces are deploying ever farther from China’s immediate periphery; Beijing has projected power into the Arctic and established bases and logistical points in the Indian Ocean and Horn of Africa. Popular Chinese movies depict Beijing replacing Washington as the dominant actor in sub-Saharan Africa—a fi ctional representation of a real-life effort long under way. The Belt and Road Initiative bespeaks an aspiration to link China to countries throughout Central Asia, the Middle East, and Europe; BRI, AIIB, and RCEP look like the beginning of an alternative institutional architecture to rival Washington’s. In 2017, Xi Jinping told the Nineteenth National Congress of the Chinese Communist Party that Beijing could now “take center stage in the world” and act as an alternative to U.S. leadership.38

These ambitions may or may not be realistic. But they demonstrate just how signifi cantly the world’s leading authoritarian powers desire to shift the global environment over time. The revisionism we are seeing today may therefore be only the beginning. As China’s power continues to grow, or if it is successful in dominating the Western Pacifi c, it will surely move on to grander endeavors. If Russia reconsolidates control over the former Soviet space, it may seek to bring parts of the former Warsaw Pact to heel. Historically, this has been a recurring pattern of great-power behavior—interests expand with power, the appetite grows with the eating, risk-taking increases as early gambles are seen to pay off.39 This pattern is precisely why the revival of great-power competition is so concerning—because geopolitical revisionism by unsatisfied major powers has so often presaged intensifying international conflict, confrontation, and even war. The great-power behavior occurring today represents the warning light flashing on the dashboard. It tells us there may be still-greater traumas to come.

# Case

### AT Debris

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

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

Kessler Syndrome is overhyped. A chorus of online commenters great any news of upcoming low earth orbit satellites with worry that humanity will to lose access to space. I now think they are wrong. What is Kessler Syndrome? Here’s the popular view on Kessler Syndrome. Every once in a while, a piece of junk in space hits a satellite. This single impact destroys the satellite, and breaks off several thousand additional pieces. These new pieces now fly around space looking for other satellites to hit, and so exponentially multiply themselves over time, like a nuclear reaction, until a sphere of man-made debris surrounds the earth, and humanity no longer has access to space nor the benefits of satellites. It is a dark picture. Is Kessler Syndrome likely to happen? I had to stop everything and spend an afternoon doing back-of-the-napkin math to know how big the threat is. To estimate, we need to know where the stuff in space is, how much mass is there, and how long it would take to deorbit. The orbital area around earth can be broken down into four regions. Low LEO - Up to about 400km. Things that orbit here burn up in the earth’s atmosphere quickly - between a few months to two years. The space station operates at the high end of this range. It loses about a kilometer of altitude a month and if not pushed higher every few months, would soon burn up. For all practical purposes, Low LEO doesn’t matter for Kessler Syndrome. If Low LEO was ever full of space junk, we’d just wait a year and a half, and the problem would be over. High LEO - 400km to 2000km. This where most heavy satellites and most space junk orbits. The air is thin enough here that satellites only go down slowly, and they have a much farther distance to fall. It can take 50 years for stuff here to get down. This is where Kessler Syndrome could be an issue. Mid Orbit - GPS satellites and other navigation satellites travel here in lonely, long lives. The volume of space is so huge, and the number of satellites so few, that we don’t need to worry about Kessler here. GEO - If you put a satellite far enough out from earth, the speed that the satellite travels around the earth will match the speed of the surface of the earth rotating under it. From the ground, the satellite will appear to hang motionless. Usually the geostationary orbit is used by big weather satellites and big TV broadcasting satellites. (This apparent motionlessness is why satellite TV dishes can be mounted pointing in a fixed direction. You can find approximate south just by looking around at the dishes in your northern hemisphere neighborhood.) For Kessler purposes, GEO orbit is roughly a ring 384,400 km around. However, all the satellites here are moving the same direction at the same speed - debris doesn’t get free velocity from the speed of the satellites. Also, it’s quite expensive to get a satellite here, and so there aren’t many, only about one satellite per 1000km of the ring. Kessler is not a problem here. How bad could Kessler Syndrome in High LEO be? Let’s imagine a worst case scenario. An evil alien intelligence chops up everything in High LEO, turning it into 1cm cubes of death orbiting at 1000km, spread as evenly across the surface of this sphere as orbital mechanics would allow. Is humanity cut off from space? I’m guessing the world has launched about 10,000 tons of satellites total. For guessing purposes, I’ll assume 2,500 tons of satellites and junk currently in High LEO. If satellites are made of aluminum, with a density of 2.70 g/cm3, then that’s 839,985,870 1cm cubes. A sphere for an orbit of 1,000km has a surface area of 682,752,000 square KM. So there would be one cube of junk per .81 square KM. If a rocket traveled through that, its odds of hitting that cube are tiny - less than 1 in 10,000. So even in the worst case, we don’t lose access to space. Now though you can travel through the debris, you couldn’t keep a satellite alive for long in this orbit of death. Kessler Syndrome at its worst just prevents us from putting satellites in certain orbits. In real life, there’s a lot of factors that make Kessler syndrome even less of a problem than our worst case though experiment. Debris would be spread over a volume of space, not a single orbital surface, making collisions orders of magnitudes less likely..

#### It takes centuries and adaptation solves

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The dynamics of the Kessler Syndrome are real, and most people studying it agree on the concept: if there is sufficient density of objects and mass, a chain reaction of debris breaking up objects and creating more debris can occur. But the timescale of this process takes decades and centuries. There are many assumptions that go into these models. Though there is still argument about this, many people in the field think that the process is already underway in low earth orbit. But others, including myself, think we can stop it if we take action. This is a slow motion disaster that we can prevent. But in spite of hype to the contrary, we will never “lose access to space”. Certain missions may become impractical or too expensive, and we may decide that some orbits are too risky for humans. Even that depends on the tolerance for the risk. But robots don’t have mothers, and if we feel it is worthwhile we will take the risk and fly the satellites where we need to. To the specifics of the question, it will take many decades. It will not destroy all satellites in LEO. You won’t be able to see it from the ground unless you were extraordinarily lucky, and you happened to see a flash from a collision in the instant you were looking, with just the right lighting.

#### Squo tracking, shielding, and removal plans solve

Dr. Brian Koberlein 16, Professor of Physics at the Rochester Institute of Technology and PhD in Astrophysics from the University of Connecticut, “Cascade Effect”, 5-4, https://archive.briankoberlein.com/2016/05/04/cascade-effect/index.html

In the movie Gravity the driving force of the plot is a catastrophic cascade of space debris. An exploding satellite sends high speed debris into the path of other satellites, and the resulting collisions create more space debris until everything from a space shuttle to the International Space Station faces an eminent threat of destruction. Not unexpectedly, the movie portrayal of such a situation is not particularly accurate, but the risk of a debris cascade is very real. It’s known as the Kessler syndrome, after Donald Kessler, who first imagined the scenario in the 1970s. The problem comes down to the fact that small objects in Earth orbit can stay in orbit for a very long time. If an astronaut drops a bolt, it can stay in orbit for decades or centuries. Because the relative speed of two objects in orbit can be quite large, it doesn’t take a big object to pose a real threat to your spacecraft. On the highway a small pebble can chip your car windshield. In space it can be done by a chip of paint traveling at thousands of kilometers per hour. In the history of the space shuttle missions, there were more than 1,600 debris strikes. Because of such strikes, more than 90 space shuttle windows had to be replaced over the lifetime of shuttle missions. While that might sound alarming, it’s actually quite manageable. Upgrades and maintenance were quite common on the shuttle missions, and we tend to err on the side of caution when it comes to replacing parts. Modern spacecraft also have ways to mitigate the risk of small impacts, such as Whipple shields made of thin layers of material spaced apart so that objects disintegrate when hitting the shield rather than the spacecraft itself. We also have a tracking system that currently tracks more than 300,000 objects bigger than 1 cm, so we can make sure that most spacecraft avoid these objects. But the risk of big collisions isn’t negligible. In 2009 the Iridium 33 and Kosmos-2251 satellites collided at high speed, destroying both spacecraft and creating more dangerous debris. It wouldn’t take many collisions like this for the debris numbers to rise dramatically, and more debris means a greater risk of collisions. In Gravity the cascade happens very quickly, triggered by a single event. The reality is not quite so grave. Instead of happening overnight, Kessler syndrome would occur gradually, raising collision risks to the point where certain orbits become logistically impractical. It could occur so gradually that we might not notice it early on, and there are some that argue it’s already underway. The good news is that we’re aware of the threat. And, as the old saying goes, knowing is half the battle. Already we take steps to limit the amount of debris created. New spacecraft include end of life plans to remove them from orbit, either by sending them into Earths atmosphere to burn up, or sending them to a “graveyard orbit” that poses little risk to other spacecraft. There are also plans on the drawing board to clear orbits of debris, particularly in low-Earth orbit where the risk is greatest. The cascade effect is a real risk, but it’s also one we can likely manage with a bit of ingenuity.

### AT: Arms Race

#### Space weapon deployment doesn’t cause an arms race or increase chance of war

Lopez 12 [LAURA DELGADO LO´ PEZ, Institute for Global Environmental Strategies, Arlington, Virginia. Astropolitics. "Predicting an Arms Race in Space: Problematic Assumptions for Space Arms Control." https://www.tandfonline.com/doi/full/10.1080/14777622.2012.647391]

The previous discussion demonstrates that although a globalized space arms race could follow U.S. deployment of space weapons, it is also plausible and more likely that it may not happen at all. As Mueller states: ‘‘In the end, most of the inevitability arguments are weak.’’62 The assumptions discussed here break the argument into a series of debatable maxims that other scholars have also considered. Hays, for instance, counters the inevitability argument by pointing out that previous ASAT tests did not have this purported destabilizing effect, to which we can add that even after the Chinese ASAT test, neither Russia nor the United States, who would be both capable and more politically likely to launch space weapons, moved forward in that direction.63 Although some may draw attention to the recent wake-up calls in order to underline a sense of urgency, one should also recall that when it seemed truly inevitable before, it did not happen either. In his detailed account of military space developments from 1945 to 1984, Paul Stares described how superpowers’ assessment of the value of space weapons shifted, with a ‘‘hiatus in testing’’ reflecting the attractiveness of satellites as military targets.64 In this changed landscape, Stares also assumed the inevitability argument, claiming that ‘‘the chances of space remaining a ‘sanctuary’ [absence of weapons] into the 21st century appear today to be remote.’’65 Perhaps the conditions are more conducive now, but the important point to be reiterated is that the outcome is not inevitable, and that any such prediction must be undertaken with caution. One of the most prominent theorists to propose an alternate picture and pair it with an aggressive pro-space weapons stance is Everett Dolman. In his Astropolitik theory, Dolman summarizes the steps that the United States must take to assume control of space, particularly through withdrawal from the current space regime.66 This move, he argues, would benefit not only the United States, but also the rest of the world, since having a democracy controlling space is a catalyst for peace.67 Elsewhere, he writes: ‘‘Only a liberal world hegemon would be able to practice the restraint necessary to maintain its preponderant balance of hegemonic power without resorting to an attempt at empire.’’68 Accordingly, he believes that this strategy would be ‘‘perceived correctly as an attempt at continuing U.S. hegemony,’’69 but that other countries, correctly assessing U.S. leadership in space, would not seek to deploy their own systems. Having the ability to prevent the stationing of foreign weapons systems in space, he writes, ‘‘makes the possibility of large-scale space war and a military space race less likely, not more.’’70 In fact, he says, ‘‘to suggest that the inevitable result is a space arms competition is the worst kind of mirror-imaging.’’71 Dolman argues that the weaponization of space by the United States would ‘‘decrease the likelihood of an arms race by shifting spending away from conventional weapons systems,’’ which would reduce U.S. capabilities in territorial occupation and would thus be perceived as less threatening to other countries.72

### AT: Space Col

#### Space col causes inter-colony wars and war with ETs---extinction.

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3.3 Extraterrestrial life The scientific understanding of the origins of humankind and of life on Earth thus far paints a clear picture: We are the “products” of biological evolution, just as all other life forms on Earth. Furthermore, we know that life can come into existence where there was no life before, through so-called abiogenetic mechanisms. These basic facts lead to a clear conclusion: It is very improbable that life on Earth is a once-in-a-universe event; it is highly probable that life has come into existence elsewhere in the universe as well. We do not know whether extraterrestrial life currently exists, and whether there is any extraterrestrial life in our vicinity (as far as we know, there is none in our Solar System). In theory, our galaxy might be full of life and even highly intelligent and technologically advanced life, but, as the famous Fermi paradox posits32, there is no trace of any extraterrestrial intelligence. Be that as it may, it is possible that there is extraterrestrial life beyond Earth, and it is possible that we will come into contact with extraterrestrial life due to colonization activity. What should our moral attitude towards extraterrestrial life look like? The moral issue of our attitudes towards extraterrestrial life can be divided into three classes of problems, according to the type of life we are dealing with: Primitive non-sentient life. Primitive sentient life. Non-primitive sentient life. Primitive non-sentient life are life forms that resemble microbial life forms on Earth, such as bacteria. Extraterrestrial microbial life can be of great instrumental value, specifically to humans, but also in a more general sense. That is a strong argument in favor of studying and preserving extraterrestrial microbial life33; we should not go out of our way to destroy microbial life, because that life might be very useful. The main moral issue about primitive non-sentient life, however, is not the question of instrumental value, but rather the question of intrinsic value: Is there a moral obligation for humans not to manipulate or even end extraterrestrial microbial life forms? This problem is, in all likelihood, the most pressing moral issue about extraterrestrial life and space colonization and one that deserves greater practical attention34. A common argument in favor of the intrinsic value position is that of conation or goal-orientedness35 36: Because even microbial life forms act vaguely rational (they have goals and behave so as to achieve their goals), their existence has some intrinsic value. The problem with this moral argument is that it can easily lead to the conclusion of strong conservationism, whereby any habitable planet or moon should remain uncolonized, lest we interfere with microbes that we might have failed to detect37. In addition, if we accept a strong version of the intrinsic value argument, we already have immense moral problems: On Earth, we do not particularly care for any microbial life form on intrinsic grounds, and we even actively fight some of them. Primitive sentient life are life forms that are not as intelligent as humans, but that are sentient, in the sense of being able to experience positive or negative affective states. Even though sentience is not a perfectly precise concept38, and even though we lack the means for truly assessing qualia (subjective experiences) of life forms other than humans39, it is almost certain that we humans are not the only life form capable of experiencing pain and pain-related suffering and that many animals on our planet are sentient as well40. Sentient extraterrestrial life forms require a different moral stance than non-sentient life forms. Imagine, for example, that two human space ship are about to land on an exoplanet. As the space ships are landing, the exhaust from their engines heats up the ground. Space ship A is landing on a nest of insect-like non-sentient life forms, frying them alive in the process. Space ship B is landing on a herd of bunny-like sentient creatures, frying them alive in the process. Both outcomes are unfortunate, but undoubtedly, killing the sentient bunny-like creatures must be morally worse than killing the non-sentient insect-like creatures, because the bunnies experienced enormous pain while they were being killed. Our moral stance towards sentient primitive extraterrestrial life will have to take sentience into account. Avoiding suffering in sentient extraterrestrial life should be a universal rule of space colonization. Somewhat obviously, such a rule would also prohibit treating sentient extraterrestrial life forms as food (But it is highly improbable that humans would have to routinely rely on extraterrestrial sentient life forms as sources of nutrition, even though we would be technologically advanced enough to engage in intersolar space colonization. We are in the process of overcoming traditional agriculture today41; reverting to traditional agriculture on future extrasolar colonies would amount to an extraordinarily improbable and inefficient anachronism.). Non-primitive sentient life are life forms that are sentient and possess a general intelligence at least as great as our own (It is possible that highly intelligent life forms might be non-sentient, but at least on Earth, sentience seems to correlate with intelligence.). The moral challenge of this type of extraterrestrial life is the same as with primitive sentient life, and there are additional moral problems to consider. If there are intelligent life forms beyond Earth, their levels of technological development will have great variance; some life forms will be intelligent, but not yet developed, whereas others will be intelligent and much more technologically advanced than we are. Intelligent life forms that are less technologically developed than we are present us with a moral problem: Should we interact with such civilizations and try to help them develop faster and overcome problems? This moral problem has perhaps most famously been explored in the television show Star Trek with its “Prime Directive”: The fictional United Federation of Planets is never to interfere with a technologically undeveloped civilization in order to avoid doing damage (Alas, the protagonists of Star Trek end up violating the Prime Directive time and again; doing so makes for a good story.). More generally, the problem of non-interference can be described as a reversed Zoo hypothesis42, whereby it is not extraterrestrial civilizations treating Earth like a conservation project, but us humans pondering whether we should treat extraterrestrial civilizations as conservation projects. A strong argument in favor of non-interference is the risk of both causing bad outcomes, both in the short- as well as in the long-term. Interacting with less developed civilizations might inadvertently do more harm than good, and it might steer the affected civilizations away from a path to development that might be beneficial to humankind in the long run. On the other hand, however, not investing a small amount of resources to greatly improve lives and reduce suffering seems morally dubious. If an extraterrestrial civilization that is going through a historical era similar to our Middle Ages is confronted with some catastrophic disease like our Black Death pandemic, not helping that civilization fight that pandemic seems cruel; not least because the cost for helping that civilization would almost certainly be trivially low. 3.4 Cosmic suffering Imagine that humankind has successfully mastered phase II colonization (colonization beyond our Solar System). All the problems described in the previous sections and subsections have long been successfully solved, and humankind is progressing steadily and peacefully. Then, something happens. At some point and for some reason, future humans decide that they do not want to merely engage in space colonization, but to do more: Actively seed the universe with (non-human) life43. Given the technological development of future humankind, it is relatively easy to send out non-sentient primitive life forms across the galaxy. Unfortunately, something horrible happens: The primitive microbial life-forms sent out into the cosmos mutate into aggressive bacteria that attack any life form they encounter, including sentient life – and in doing so, they cause tremendous pain and agony in the organisms they attack. The benevolent idea of spreading life has quickly turned into unimaginable suffering of trillions of sentient beings across the galaxy. Colonizing humans have thus created suffering on a cosmic, or astronomical, scale44. Cosmic suffering is the risk of creating suffering on a scale that is either not possible or not as probable without space colonization. There are many potential scenarios in which successful space colonization results in cosmic suffering. For example, the general problem of the repugnant conclusion discussed further above can also be regarded as an example of this class of risks. Cosmic suffering is a severe problem because it is contingent on, or at least made more likely by, successful space colonization. The conceptually challenging aspect of cosmic suffering is the correlation of cosmic suffering with the degree of space colonization: The greater the level of space colonization, the greater the risks of cosmic suffering become. This is the opposite of the relationship between space colonization and existential risks: The greater the level of space colonization, the lower existential risks become – this is one of the main motivations for space colonization, after all. In other words, successful space colonization decreases the probability that something goes wrong for humankind in terms of existential risks, but it increases the probability that something goes wrong in terms of suffering for the whole universe. 4. Security challenges In the above discussions of political and moral challenges, it is presumed that the problems and challenges that arise do so in a generally peaceful system of colonization. However, peace in the sense of a lack of armed conflict is not guaranteed with space colonization. On the contrary: Space colonization might produce new kinds of security challenges. 4.1 Inter-colonial war Violence and war have been decreasing over the course of our civilization’s history45 46 47. The decrease in violent armed conflict has coincided with an increase in cultural, political, and economic interconnectedness. Even though major armed conflicts are not yet a thing of the past48, humankind will probably continue on its current trajectory of peace. With space colonization, however, the trend of growing closer together might reverse because of increasing fragmentation, and with that reversal, peaceful cooperation might again give way to armed conflict. Some amount of human fragmentation due to space colonization is almost inevitable. One of the strongest biases we humans have is the intergroup bias49: We tend to separate people into ingroups and outgroups, and we generally favor our own ingroup over any outgroup. Our ingroup favoritism is often the source of collective identity: We identify with our home city and think it is better than other cities; we identify with our favorite football team and think it is better than other teams; we identify with our country of origin and think it is better than other countries. In a future in which humans have successfully mastered type I colonization (colonization within our Solar System) and perhaps even type II colonization (intersolar colonization), belonging to one habitat rather than another will almost certainly also be a source of collective identity. Humans born and raised on Venus would probably have more positive general attitudes towards Venus than towards Earth. That is not a problem in and of itself, but it can become a problem: If humankind is very successful at space colonization and manages to establish colonies across the galaxy, the ingroup dynamics within colonies and regions of colonies might grow so much that the perceived benefits of armed conflict increase, and the perceived costs decrease. In part, this might be due to the infrahumanization (or dehumanization) bias50: Our intergroup bias can have the effect of perceiving members of the outgroup as less human than members of our own ingroup. The problem of intergroup bias and armed conflict could be compounded by real biological differences in the long-term future. In the long term, different colonies of humans might adopt different stances on human enhancement technology and embrace different kinds of enhancement technologies. These differential paths of human enhancement might result in technology-induced quasi-speciation, whereby different strands of humans have increasingly distinct biological traits. The ultimate result of such a development might be a strong fragmentation of humankind and an increasing arms race in order to defend against the outgroup of all the (former) humans that are different from the ingroup (former) humans51. 4.2 Extraterrestrial (existential) risks Space colonization will increase the probability of discovering and coming into contact with extraterrestrial intelligence, either biological or artificial (in the sense of hypothetical advanced artificial general intelligence52). That prospect poses some moral challenges, as argued in subsection 3.3. However, it might also pose a security challenge if an extraterrestrial intelligence more technologically advanced than humankind has goals and preferences that go against the goals and preferences of humankind. In general, there are three categories of attitudes an extraterrestrial intelligence can have towards humankind53. First, an extraterrestrial intelligence can be benevolent. A benevolent extraterrestrial intelligence is one that would change its goals and preferences upon learning of humankind. Humankind is a benevolent intelligence: If we, for example, came into contact with an extraterrestrial civilization, we would obviously take the goals and preferences of that civilization into account and update our own goals and preferences, since we are morally advanced enough to do so. Second, an extraterrestrial intelligence can be apathetic. An apathetic extraterrestrial intelligence is one that does not at all change its goals and preferences upon learning of humankind. An apathetic intelligence would neither try to accommodate humankind, nor would it react in some non-friendly way. It would not care at all. The attitude of an apathetic intelligence is similar to the attitude we humans have when it comes to some random microbial life form on Earth: We might understand that that life form exists, but we do not care either way. Third, an extraterrestrial intelligence can be hostile. Hostility in a general sense means that an intelligence reacts to learning of humankind by regarding its own goals and preferences as categorically more important than humankind’s. A hostile extraterrestrial intelligence is not necessarily a security threat to humankind; hostility in this context does not mean hostility in the Hollywood kind but hostility in the sense of active disregard of humankind’s goals and preferences. That, however, might still represent a tremendous security risk. For example, a hostile intelligence might prefer humankind not to exist because our mere existence is perceived as a slight discomfort to the extraterrestrial intelligence. Hostile extraterrestrial intelligence thus represents a form of existential risk.

#### Outweighs on scope---NOT just earth life, but all life in the universe would end.

Phil **Torres 18**. Project for Future Human Flourishing. 06/2018. “Space Colonization and Suffering Risks: Reassessing the ‘Maxipok Rule.’” Futures, vol. 100, pp. 74–85.

5. Space-Age Weaponry and the Balance of Terror Yet there is another strategy for neutralizing the Hobbesian trap, namely, a policy of deterrence, also known as a “balance of terror” or, during the Cold War, “mutually-assured destruction” (MAD). This asserts that “if you strike me, I will most assuredly strike back with equal or greater force, and if I strike you it will only be because you struck me first.”xvii Deterrence is only effective when one’s adversaries genuinely believe the statement, “I will most assuredly strike back.” This returns us to Hobbes’s third cause of conflict from section 3: glory, honor, or credibility. To establish credibility and, therefore, dissuade potential attackers, one has reason to engage in confrontations with others and, in doing so, to demonstrate one’s capacity for violence. The question is whether policies of deterrence implemented by civilizations throughout the cosmos would be sufficient to obviate war. To answer this question, let’s begin by considering the unsettling range of weapons that will likely be available to our spacefaring progeny; we will then explore how these weapons could enhance or mitigate the effectiveness of deterrence. 5.1 Weapons of Total Destruction (WTDs) There are a variety of “kill mechanisms” that one civilization could use to obliterate another. In relatively close propinquity, chemical and biological weapons could offer a means of targeted violence, since the deleterious effects of such weapons might be limited to a particular species (Deudney forthcoming). For example, the toxicity of a chemical X might be low for a species A but lethal to a species B. This could enable A to use X on B without fear of X harming A—a concern that has dissuaded some terrorists from employing chemical weapons. The same goes for a pathogenic germ Y: since pathogens often only harm single species, biological weapons could be used without the perpetrators worrying about becoming sick. With respect to artificial intelligences, there could be viral malware that affects only certain types of software; in this case, such viruses could be transferred not at the velocity of a sneeze but at the speed of light, traversing astronomically large stretches of space to devastate colonies of artificial-substrate beings. Another possibility involves weaponizing “minor planets” like asteroids. This hints at the deflection dilemma discussed by Sagan (1994), among others, whereby the very same technology that could deflect an asteroid away from Earth could also be used to redirect one toward it. The resultant “planetoid bombs” could be launched in the direction of target civilizations at extremely high velocities and inflict far greater destruction than all the nuclear arsenals on Earth combined (see Cole and Cox 1965; Deudney forthcoming). Even more, asteroids are extremely numerous in the solar system and have a wide range of sizes, with estimates of 1.1 to 1.9 million that have greater-than-1-kilometer diameters in the asteroid belt between Mars and Jupiter. (A 1- kilometer impactor striking Earth would likely annihilate humanity by causing an impact winter.) Thus, asteroids constitute an abundant source of easily obtainable, civilization-ending weaponry— a particularly worrisome fact given that the technological capabilities to redirect asteroids will likely emerge at an early stage in our diaspora “out of Earth,” as it were (see Deudney forthcoming). Other futuristic space weapons include military drones that either initiate attacks or engage in clandestine surveillance of other civilizations. Such drones could hide themselves from counter-surveillance detectors by employing metamaterial invisibility cloaks and propagate themselves through the von Neumann process of self-replication, that is, by converting raw materials into clones of themselves. There is also the possibility of using “heliobeams,” or “sun guns,” to destroy targets by concentrating large amounts of solar radiation via a concave mirror on a satellite. Even more catastrophic are direct-energy weapons (DEWs) like lasers and particlebeams that use highly focused energy to superheat their targets. In fact, the US government has already developed weapons of this sort—they are science fact rather than fiction—although future breakthroughs could enable them to become immensely more destructive. If this is the case, they will offer yet another mechanism for wreaking unprecedented harm (see Deudney forthcoming). Along these lines, Anders Sandberg (forthcoming) suggests that technologically advanced civilizations could potentially use gravitational waves to create black holes. Generating waves of sufficient intensity would be energetically inefficient, according to current physics, but they have the advantage that they can interact with dark matter objects, unlike electromagnetic-energy weapons. Even more, the universe appears to be in a “metastable” energy state. This suggests that one could tip it into a more stable, lower-energy state, perhaps by concentrating huge quantities of energy in tiny regions of spacetime, as occurs in some high-powered physics experiments. In other words, a particle collider could be weaponized to intentionally nucleate a “vacuum bubble,” or sphere of “true vacuum” spreading in all directions at the speed of light and destroying everything with which it comes into contact. Who might weaponize a particle collider? First, there could be actors who use the threat of a vacuum bubble for blackmail purposes. Second, there could be madmen (like Hitler) who create a vacuum bubble to avoid defeat. That is to say, a predatory actor could hold the following preference ordering: (i) triumphant victory over, say, its Local Group, (ii) total annihilation of the universe, and (iii) defeat. Third, particle colliders would also be the ideal WTD for RNUs, since it would enable them to obliterate not only all extant life in the universe but the very potential for life to arise—and it would do this without inflicting any suffering whatsoever.xviii Another possibility is that Tuckerian actors create a vacuum bubble for the purely defensive reason of eliminating all potential attackers in the universe. As Sandberg (2017) speculates, it might be possible for “certain configurations of matter, energy, black holes, etc. [to] induce a post-transition structure that can act as an assembler.” This “assembler” would enable “some information [to] be transmitted into the new state,” thus making it possible for a civilization to “survive,” in some sense, the universe settling into a lower-energy configuration. On the other side of this transition, the “structure” can recrudesce into a daughter new civilization with the certitude that it is completely alone and, therefore, safe. Finally, it is crucial to note that future beings—some of whom may have hugely augmented cognitive capacities—will almost certainly invent new weapons that are more powerful and effective than anything we could imagine. Such weapons could enable civilizations—or perhaps lone wolves, of which there could be, once again, trillions and trillions and trillions—to cause unprecedented injury to other civilizations. Consider the following passage from Bostrom (2013): One can readily imagine a class of existential-catastrophe scenarios in which some technology is discovered that puts immense destructive power into the hands of a large number of individuals. If there is no effective defense against this destructive power, and no way to prevent individuals from having access to it, then civilization cannot last, since in a sufficiently large population there are bound to be some individuals who will use any destructive power available to them. Scale this up from the individual level to the cosmopolitical level and the same conclusion follows: Life in the universe cannot last.

### AT: Climate Change

1] No internal link between radiative forcing and climate change – they haven’t proven its reverse causal which means even without mega constellations there is climate change. They have to prove no radiative forcing means no climate change. Their internal link is rocket launches which is also inevitable with the public sector.

#### Warming doesn’t cause extinction

* peer-reviewed journal shows IPCC exaggeration
* history proves resilience
* no extinction- warming under Paris goals
* rock breaking strategy could offset warming

IBD 18 [Investors Business Daily, Citing Study from Peer reviewed journal by Lewis and Curry, “Here's One Global Warming Study Nobody Wants You To See”, 4/25/18, https://www.investors.com/politics/editorials/global-warming-computer-models-co2-emissions/]

Settled Science: A new study published in a peer-reviewed journal finds that climate models exaggerate the global warming from CO2 emissions by as much as 45%. If these findings hold true, it's huge news. No wonder the mainstream press is ignoring it.

In the study, authors Nic Lewis and Judith Curry looked at actual temperature records and compared them with climate change computer models. What they found is that the planet has shown itself to be far less sensitive to increases in CO2 than the climate models say. As a result, they say, the planet will warm less than the models predict, even if we continue pumping CO2 into the atmosphere.

As Lewis explains: "Our results imply that, for any future emissions scenario, future warming is likely to be substantially lower than the central computer model-simulated level projected by the (United Nations Intergovernmental Panel on Climate Change), and highly unlikely to exceed that level.

How much lower? Lewis and Curry say that their findings show temperature increases will be 30%-45% lower than the climate models say. If they are right, then there's little to worry about, even if we don't drastically reduce CO2 emissions.

The planet will warm from human activity, but not nearly enough to cause the sort of end-of-the-world calamities we keep hearing about. In fact, the resulting warming would be below the target set at the Paris agreement.

### AT: Cyber

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1AC Denkenberger 21 [David Denkenberger, Anders Sandberg, Ross John Tieman, and Joshua M. Pearce, \* assistant professor of mechanical engineering at University of Alaska Fairbanks, “Long-term cost-effectiveness of interventions for loss of electricity/industry compared to artificial general intelligence safety,” 2021, *European Journal of Futures Research*, Vol. 9, Issue 1, https://doi.org/10.1186/s40309-021-00178-z, EA]

Civilization relies on a network of highly interdependent critical infrastructure (CI) to provide basic necessities (water, food, shelter, basic goods), as well as complex items (computers, cars, space shuttles) and services (the internet, cloud computing, global supply chains), henceforth referred to as industry. Electricity and the electrical infrastructure that distributes it plays an important role within industry, providing a convenient means to distribute energy able to be converted into various forms of useful work. Electricity is one component of industry albeit a critical one. Industry provides the means to sustain advanced civilization structures and the citizens that inhabit them. These structures play a critical role in realizing various futures by allowing humanity to discover and utilize new resources, adapt to various environments, and resist natural stressors.

Though industry is capable of resisting small stressors, a sufficiently large event can precipitate cascading failure of CI systems, resulting in a collapse of industry. If one does not temporally discount the value of future people, the long-term future (thousands, millions, or even billions of years) could contain an astronomically large amount of value [18]. Events capable of curtailing the potential of civilization (existential risks, such as human extinction or an unrecoverable collapse) would prevent such futures from being achieved, implying reducing the likelihood of such events is of the utmost importance [100]. Reducing the prevalence of existential risks factors; events, systemic structures, or biases which increase the likelihood of extinction but do not cause extinction by themselves is also highly valuable. Complete collapse or degraded function of industry would drastically reduce humanity’s capacity to coordinate and deploy technology to prevent existential risks, representing an existential risk factor. Consequently, interventions preventing loss of industry, reducing the magnitude of impacts, or increasing speed of recovery could be extremely valuable.

Existential risk research is, by nature, future focused, requiring the investigation of events that have not yet occurred. Futures studies methodologies are often applied to uncover salient trends or events, and explore potential causal structures [54, 123]. Probabilistic modeling techniques can then be used to determine the likelihood of such events occurring, including adequate treatment of uncertainty [101]. The cost-effectiveness modeling approach outlined in this paper is an example of this, attempting to assess the marginal utility of losing industry interventions on improving the long-term future. This approach could guide future efforts to assess the relative cost-effectiveness of interventions for different risks, existential or otherwise. More practically, this research can inform prioritization efforts of industrialized countries by providing estimates of the cost of global industrial collapse, and the utility of resilience interventions. This is relevant to the European Union which has a highly industrialized economy, providing $2.3 Trillion USD of the $13.7 Trillion USD global total of value add manufacturing [122]. The EU has shifted toward a more proactive foresight approach about natural and man-made disasters, noting the importance of rare high-impact events, systemic risks, and converging trends requiring better data and forecasting to drive a more ambitious crisis management system [47]. Still, it is clear that most academic and institutional emphasis has been on “ordinary” rather than extreme disasters, and risks from industry to the public and environment rather than widespread failures of industrial services causing harm.

The integrated nature of the electric grid, which is based on centralized generation makes the entire system vulnerable to disruption.1 There are a number of anthropogenic and natural catastrophes that could result in regional-scale electrical grid failure, which would be expected to halt the majority of industries and machines in that area. A high-altitude electromagnetic pulse (HEMP) caused by a nuclear weapon could disable electricity over part of a continent [16, 48, 66, 93]. This could destroy the majority of electrical grid infrastructure, and as fossil fuel extraction and industry is reliant on electricity [49], industry would be disabled. Similarly, solar storms have destroyed electrical transformers connected to long transmission lines in the past [117]. The Carrington event in 1859 damaged telegraph lines, which was the only electrical infrastructure in existence at the time. It also caused Aurora Borealis that was visible in Cuba and Jamaica [70]. This could potentially disable electrical systems at high latitudes, which could represent 10% of electricity/industry globally. Though solar storms may last less than the 12 h that would be required to expose the entire earth with direct line of sight, the earth’s magnetic field lines redirect the storm to affect the opposite side of the earth [117]. Lastly, both physical [6, 8, 69, 89, 111] and cyber attacks [3, 63, 90, 96, 118, 128, 130] could also compromise electric grids. Physical attacks include traditional acts of terrorism such as bombing or sabotage [130] in addition to EMP attacks. Significant actors could scale up physical attacks, for example by using drones. A scenario could include terrorist groups hindering individual power plants [126], while a large adversary could undertake a similar operation physically to all plants and electrical grids in a region. Unfortunately, the traditional power grid infrastructure is simply incapable of withstanding intentional physical attacks [91]. Damage to the electric grid resulting in physical attack could be long lasting, as most traditional power plants operate with large transformers that are difficult to move and source. Custom rebuilt transformers require time for replacement ranging from months and even up to years [91]. For example, a relatively mild 2013 sniper attack on California’s Pacific Gas and Electric (PG&E) substation, which injured no one directly, was able to disable 17 transformers supplying power to Silicon Valley. Repairs and improvements cost PG&E roughly $100 million and lasted about a month [10, 102]. A coordinated attack with relatively simple technology (e.g., guns) could cause a regional electricity disruption. However, a high-tech attack could be even further widespread. The Pentagon reports spending roughly $100 million to repair cyber-related damages to the electric grid in 2009 [57]. There is also evidence that a computer virus caused an electrical outage in the Ukraine [56]. Unlike simplistic physical attacks, cyber attackers are capable of penetrating critical electric infrastructure from remote regions of the world, needing only communication pathways (e.g., the Internet or infected memory sticks) to install malware into the control systems of the electric power grid. For example, Stuxnet was a computer worm that destroyed Iranian centrifuges [73] to disable their nuclear industry. Many efforts are underway to harden the grid from such attacks [51, 63]. The U.S. Department of Homeland Security responded to ~ 200 cyber incidents in 2012 and 41% involved the electrical grid [103]. Nations routinely have made attempts to map current critical infrastructure for future navigation and control of the U.S. electrical system [57].

The electric grid in general is growing increasingly dependent upon the Internet and other network connections for data communication and monitoring systems [17, 112, 118, 127, 135]. Although this conveniently allows electrical suppliers management of systems, it increases the susceptibility of the grid to cyber-attack, through denial of webpage services to consumers, disruption to supervisory control and data acquisition (SCADA) operating systems, or sustained widespread power outages [3, 72, 118, 120]. Thus global or regional loss of the Internet could have similar implications.

### AT: Miscalc

#### No retal or escalation from satellite attacks

Eric J. Zarybnisky 18, MA in National Security Studies from the Naval War College, PhD in Operations Research from the MIT Sloan School of Management, Lt Col, USAF, “Celestial Deterrence: Deterring Aggression in the Global Commons of Space”, 3/28/2018, https://apps.dtic.mil/dtic/tr/fulltext/u2/1062004.pdf

PREVENTING AGGRESSION IN SPACE

While deterrence and the Cold War are strongly linked in the public’s mind through the nuclear standoff between the United States and the Soviet Union, the fundamentals of deterrence date back millennia and deterrence remains relevant. Thucydides alludes to the concept of deterrence in his telling of the Peloponnesian War when he describes rivals seeking advantages, such as recruiting allies, to dissuade an adversary from starting or expanding a conflict.6F6 Aggression in space was successfully avoided during the Cold War because both sides viewed an attack on military satellites as highly escalatory, and such an action would likely result in general nuclear war.7F7 In today’s more nuanced world, attacking satellites, including military satellites, does not necessarily result in nuclear war. For instance, foreign countries have used high-powered lasers against American intelligence-gathering satellites8F8 and the United States has been reluctant to respond, let alone retaliate with nuclear weapons. This shift in policy is a result of the broader use of gray zone operations, to which countries struggle to respond while limiting escalation. Beginning with the fundamentals of deterrence illuminates how it applies to prevention of aggression in space.

#### Won’t go nuclear – seen as a normal conventional attack because of integration with ground forces

Firth 7/1/19 [News Editor at MIT Technology Review, was Chief News Editor at New Scientist. How to fight a war in space (and get away with it). July 1, 2019. MIT Technology Review]

Space is so intrinsic to how advanced militaries fight on the ground that an attack on a satellite need no longer signal the opening shot in a nuclear apocalypse. As a result, “deterrence in space is less certain than it was during the Cold War,” says Todd Harrison, who heads the Aerospace Security Project at CSIS, a think tank in Washington, DC. Non-state actors, as well as more minor powers like North Korea and Iran, are also gaining access to weapons that can bloody the noses of much larger nations in space.

### AT: Disease

#### Burnout and variation check disease

York 14 (Ian, head of the Influenza Molecular Virology and Vaccines team in the Immunology and Pathogenesis Branch of the Influenza Division at the CDC, PhD in Molecular Virology and Immunology from McMaster University, M.Sc. in Veterinary Microbiology and Immunology from the University of Guelph, former Assistant Prof of Microbiology & Molecular Genetics at Michigan State, “Why Don't Diseases Completely Wipe Out Species?” 6/4/2014, http://www.quora.com/Why-dont-diseases-completely-wipe-out-species)

But mostly diseases don't drive species extinct. There are several reasons for that. For one, the most dangerous diseases are those that spread from one individual to another. If the disease is highly lethal, then the population drops, and it becomes less likely that individuals will contact each other during the infectious phase. Highly contagious diseases tend to burn themselves out that way.¶ Probably the main reason is variation. Within the host and the pathogen population there will be a wide range of variants. Some hosts may be naturally resistant. Some pathogens will be less virulent. And either alone or in combination, you end up with infected individuals who survive.¶ We see this in HIV, for example. There is a small fraction of humans who are naturally resistant or altogether immune to HIV, either because of their CCR5 allele or their MHC Class I type. And there are a handful of people who were infected with defective versions of HIV that didn't progress to disease. ¶ We can see indications of this sort of thing happening in the past, because our genomes contain many instances of pathogen resistance genes that have spread through the whole population. Those all started off as rare mutations that conferred a strong selection advantage to the carriers, meaning that the specific infectious diseases were serious threats to the species.