## Neg – Space Assets 2 – BFHR

### ASATs ADV---Space Deterrence Fails

#### Space deterrence fails.

Jim Cooper, 21 (Jim Cooper is a member of the U.S. House of Representatives and he serves as chairman of the Subcommittee on Strategic Forces, 7-23-2021, accessed on 7-9-2022, War on the Rocks, “UPDATING SPACE DOCTRINE: HOW TO AVOID WORLD WAR III”, <https://warontherocks.com/2021/07/updating-space-doctrine-how-to-avoid-world-war-iii/>, HBisevac)

The United States can’t **fall back** on **deterrence** in **space**, whether by denial or punishment. No one today finds U.S. space assets too **daunting** to think of attacking. Satellites follow predictable orbits — the lowest of which can be reached by a missile within five to 15 minutes — and they and their ground stations are equally vulnerable to non-kinetic attacks such as laser dazzling, electronic jamming, and cyber attacks. Countries like China and Russia are exploiting this, which is why they’ve developed arsenals of anti-satellite systems. North Korea and Iran are also in the **hunt**. With so few satellites of their own to protect, they can **focus on** **playing offense**.

Deterrence by punishment, the threat of U.S. retribution after an attack, also seems **feeble**. The first problem is **attribution**. Although early warning systems would likely spot the heat flares accompanying an anti-satellite missile attack, determining the source of a sophisticated cyber attack is **far more challenging**. Absent a “smoking gun” anti-satellite missile launch, the United States would find it **difficult** to make a **persuasive case** for **retaliation** should a sensitive (or classified) space asset suddenly go offline, particularly if officials were uncertain why. There are tens of millions of pieces of **space debris too small to track** already in Earth’s orbits. How do you prove that space litter was not guilty?

Assuming that the United States can persuasively attribute the attack, then it must **convincingly defend** against it. America has **limited means** of doing so but they are **highly classified** and would seem abstract and hard to believe to the world’s citizens. Forget the pretty pictures of the Rover on Mars — space attacks involve tracking bullets or lasers. America must be able to **show** its **strength** without **compromising** its **sources**. The U.S. House Armed Services Committee is already focusing on reducing such over-classification.

### SSA ADV---Space Governance Defense---1NC

#### Space governance fails.

Dr. Steven Lambakis 18, Director of Space Studies and Senior Defense Analyst at the National Institute for Public Policy, Ph.D. at Catholic University, and Managing Editor of Comparative Strategy, “Foreign Space Capabilities: Implications for U.S. National Security”, Comparative Strategy, Volume 37, Issue 2, p. 135

A recent unclassified national security space strategy report provides no indication that the Obama Administration was preparing to actively counter the space capabilities of adversaries; rather, the Obama Administration apparently was attempting to balance its highly idealistic language with the potential realities of conflict. Yet it must be pointed out that U.S. leadership in the world today is predicated heavily on its military might. Leading by example without strength to bear against those who would transgress U.S. interests would most likely lead the nation to retreat from the defense of its interests. Moreover, such a display of weakness could lead to attacks on the United States. History does not tell us that merely leading by example through living responsibly and peacefully is the best way to defend the nation. Why would we expect this tactic to work in space? Today, counter-space operations against U.S. assets are getting attention, but there seems to be no attention given to providing the United States with capabilities to counter the hostile space activities of other nations.

There is significant discussion in official circles today about bolstering behavioral norms in space. But to whose “norms” will nations adhere? As the U.S. Deputy Assistant Secretary of Defense for Space, Doug Loverro put it, “we don’t want people shooting at satellites, we don’t believe that’s a good thing for mankind.”280 It has also been said that the establishment of norms “serves as a reminder that any battle for control over the use of space to support military operations begins well before forces begin to mobilize on Earth.”281

We cannot assume, however, that the norms which other states adopt will be those norms we deem appropriate to ensure peaceful actions and safe behavior in space. The last decade is replete with examples of other countries, some of which are potential adversaries of the United States, practicing direct ascent ASAT maneuvers; one of these was destructive, demonstrating co-orbital ASAT operations, and practicing reversible interference through jamming of radio signals or dazzling infrared sensors. The norm of self-serving behavior that advances national goals is the norm that has been most obvious in international relations for centuries. And, this norm has been reflected in space over the past 10 years. Are efforts to create benign “rules of the road” likely to replace this norm? While possible in principle, it seems extremely unlikely, and would be highly imprudent to assume as a basis for defense planning.

Another norm that characterizes the current age and should inform our thinking about space is invasion of sovereign nations. In February 2014, Russia’s president Vladimir Putin invaded Ukraine, starting with the annexation of Crimea (part of Ukraine). Since the invasion, more than 10,000 Ukrainians have been killed. This has happened despite international norms, treaties, and agreements that condemn such aggressive behavior and consider it to be politically shameful; indeed, international agreements and shaming speeches have been entirely ineffectual. The Ukrainians either did not consider that such a transgression could occur, or believed that the world would rally to their side to push back the invasion. Neither belief, of course, was based in reality. All that matters today are the facts on the ground—i.e., the nature of the regimes confronting us and the strategies they are pursuing.

There are broad national security implications of not having access to space. On land, at sea, and in the air, the United States customarily strives for peaceful, safe, and responsible behavior to avoid accidents, ensure international tensions do not flare up, and essentially collaborate with other states to ensure a stable, predictable environment—but it does so armed all the same, prepared to defend interests in each of those environments. Why? Because history is replete with violations of broken conventions and international agreements, and because peace does not last.

### SSA ADV---Space Governance Defense---2NC

#### Russia and China won’t follow new space norms

Michael Listner 18, JD, Attorney and Founder and Principal of Space Law and Policy Solutions, President and CEO of the International Space Safety Foundation, “The Art of Lawfare and the Real War in Outer Space”, The Space Review, 9/17/2018, http://www.thespacereview.com/article/3571/1

Lawfare in space continued in the intervening years between Sputnik-1 and the signature and ratification of the Outer Space Treaty and afterward. The weapon of choice: disarmament proposals for outer space. Provisions for banning so-called space weapons in the Outer Space Treaty were rejected by the Soviet Union in favor of separate arms control measures.10 These measures included proposals, some of which related to the proscription of ASATs, designed to not only gain an advantage in outer space but to gauge political intent and resolve.11

The lawfare offensive escalated after the proposed Strategic Defense Initiative with an effort curtail space-based missile defense technology through a ban on so-called space weapons and a proverbial arms race in outer space. The Prevention of an Arms Race in Outer Space (PAROS), introduced in 1985, continues to seek a legally binding measure to place any weapon in outer space, including those designed for self-defense. It spawned measures such as the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (PPWT), co-sponsored by Russia and China. This and other measures have met resistance as unverifiable and certainly are not likely to gain the advice and consent of the US Senate for ratification. The end game of the use of lawfare in the form of efforts like PAROS—the latest attempt at which was defeated in Geneva—is to propose legally binding measures that proponents would ignore to their advantage in any event. The sponsors and advocates of these hard-law measures recognize they will not come to fruition but, in the process of promoting them, will enhance their soft power and moral authority, which can be applied to entice their adversary down.

Non-binding resolutions and measures in the form of political agreements and guidelines are being used concurrently in the lawfare engagement in outer space, where proposals for legally binding measures alone fall short of the goal of creating hard law and challenging dominance in outer space. These resolutions and measures, which emphasize sustainability, are designed to perform an end run around the formalities of a treaty to entice agreement on issues that would otherwise be unacceptable in a hard-law agreement. These measures have the dual effect to create soft-power support on the one hand and hard law on the other. This tool of lawfare, which uses clichés of cooperation and sustainability, is a ploy that applies the ambiguous nature of customary international law to achieve what cannot be done through treaties: to “entice the adversary away” and create legal and political constraints to bind and degrade its use of outer space or prevent it from maintaining its superiority, all the while allowing others to play catchup and replace one form of dominance with another. While lawfare is by nature asymmetric, this indirect approach could be considered a subset an irregular tactic of lawfare, as opposed to the use of formal treaties in lawfare.

The crux is that, like space objects used in outer space, international law and its implements are dual-use in that they can be used for proactive ends or weaponized, with those using the appliances of lawfare to encourage cession of the high ground choosing the latter rather than the former. The decision to weaponize international law and its institutions to prosecute this war in space brings into question the efficacy of new rules or norms. Indeed, the idea of expanding the jurisprudence of outer space through custom, as being suggested by the United States, and more recently gap-filling rules being suggested by academia that could become custom, presents the real chance that, rather than the creation of the ploughshare of sustainability, new and more effective swords for lawfare will be forged.

#### They’re driven only by self-interest

Max Boot 11, Senior Fellow in National Security Studies at the Council on Foreign Relations, MA in History from Yale University, BA in History from UC Berkeley, Columnist for the Washington Post, “We Cannot Afford to Stop Drone Strikes”, Commentary Magazine, 10/9/2011, https://www.commentarymagazine.com/american-society/military/drone-arms-race/

The New York Times engages in some scare-mongering today about a drone ams race. Scott Shane notes correctly other nations such as China are building their own drones and in the future U.S. forces could be attacked by them–our forces will not have a monopoly on their use forever. Fair enough, but he goes further, suggesting our current use of drones to target terrorists will backfire:

If China, for instance, sends killer drones into Kazakhstan to hunt minority Uighur Muslims it accuses of plotting terrorism, what will the United States say? What if India uses remotely controlled craft to hit terrorism suspects in Kashmir, or Russia sends drones after militants in the Caucasus? American officials who protest will likely find their own example thrown back at them.

“The problem is that we’re creating an international norm” — asserting the right to strike preemptively against those we suspect of planning attacks, argues Dennis M. Gormley, a senior research fellow at the University of Pittsburgh and author of Missile Contagion, who has called for tougher export controls on American drone technology. “The copycatting is what I worry about most.”

This is a familiar trope of liberal critics who are always claiming we should forego “X” weapons system or capability, otherwise our enemies will adopt it too. We have heard this with regard to ballistic missile defense, ballistic missiles, nuclear weapons, chemical and biological weapons, land mines, exploding bullets, and other fearsome weapons. Some have even suggested the U.S. should abjure the first use of nuclear weapons–and cut down our own arsenal–to encourage similar restraint from Iran.

The argument falls apart rather quickly because it is founded on a false premise: that other nations will follow our example. In point of fact, Iran is hell-bent on getting nuclear weapons no matter what we do; China is hell-bent on getting drones; and so forth. Whether and under what circumstances they will use those weapons remains an open question–but there is little reason to think self-restraint on our part will be matched by equal self-restraint on theirs. Is Pakistan avoiding nuking India because we haven’t used nuclear weapons since 1945? Hardly. The reason is that India has a powerful nuclear deterrent to use against Pakistan. If there is one lesson of history it is a strong deterrent is a better upholder of peace than is unilateral disarmament–which is what the New York Times implicitly suggests.

Imagine if we did refrain from drone strikes against al-Qaeda–what would be the consequence? If we were to stop the strikes, would China really decide to take a softer line on Uighurs or Russia on Chechen separatists? That seems unlikely given the viciousness those states already employ in their battles against ethnic separatists–which at least in Russia’s case already includes the suspected assassination of Chechen leaders abroad. What’s the difference between sending a hit team and sending a drone?

While a decision on our part to stop drone strikes would be unlikely to alter Russian or Chinese thinking, it would have one immediate consequence: al-Qaeda would be strengthened and could regenerate the ability to attack our homeland. Drone strikes are the only effective weapon we have to combat terrorist groups in places like Pakistan or Yemen where we don’t have a lot of boots on the ground or a lot of cooperation from local authorities. We cannot afford to give them up in the vain hope it will encourage disarmament on the part of dictatorial states.

### SSA ADV---Space Governance Turn---1NC

#### The perception of US space governance leads to unchecked escalation and triggers an arms race.

Theresa **Hitchens, 8** (Theresa Hitchens is the president of the Center for Defense Information, February 2008, accessed on 7-1-2022, Scientific American, "Space Wars - Coming to the Sky Near You?", http://www.sciam.com/article.cfm?id=space-wars-coming-to-the-sky-near-you, HBisevac)

Perhaps of even greater concern is that several other nations, including one of China’s regional rivals, India, may feel **compelled** to **seek** ­**offensive** as well as **defensive capabilities in space**. The U.S. trade journal Defense News, for instance, quoted unidentified Indian defense officials as stating that their country had already begun developing its own kinetic-energy (nonexplosive, hit-to-kill) and laser-based antisatellite weapons.

If India goes down that path, its archrival Pakistan will probably **follow suit**. Like India, Pakistan has a well-developed ballistic missile program, including medium-range missiles that could launch an antisatellite system. Even Japan, the third major Asian power, might join such a **space race**. In June 2007 the National Diet of Japan began considering a bill backed by the current Fukuda government that would permit the development of satellites for “military and national security” purposes.

As for Russia, in the wake of the Chinese test President Vladimir Putin reiterated Moscow’s stance against the weaponization of space. At the same time, though, he refused to criticize Beijing’s actions and blamed the U.S. instead. The American efforts to build a missile defense system, Putin charged, and the increasingly aggressive American plans for a military position in space were prompting China’s moves. Yet Russia itself, as a major spacefaring power that has incorporated satellites into its national security structure, would be hard-pressed to forgo entering an **arms race in space**.

Given the proliferation of spacefaring entities, proponents of a **robust space warfare strategy** believe that ***arming the heavens*** is inevitable and that it would be best for the U.S. to get there first with firepower. Antisatellite and space-based weapons, they argue, will be necessary not only to defend U.S. military and commercial satellites but also to deny any future adversary the use of space capabilities to enhance the performance of its forces on the battlefield.

Yet **any arms race in space** would almost inevitably **destabilize** the **balance of power** and thereby **multiply** the **risks** of **global conflict**. In such headlong competition—whether in space or elsewhere—equilibrium among the adversaries would be **virtually impossible** to maintain. Even if the major powers did **achieve stability**, that reality would still provide **no guarantee** that both sides would perceive it to be so. The moment one side saw itself to be slipping behind the other, the first side would be strongly tempted to launch a **preemptive strike**, before things got even worse. Ironically, the same would hold for the side that perceived itself to have gained an advantage. Again, there would be strong temptation to **strike first**, before the adversary could catch up. Finally, a space weapons race would ratchet up the chances that a mere technological mistake could **trigger a battle**. After all, in the distant void, reliably distinguishing an intentional act from an accidental one would be **highly problematic**.

Hit-to-Kill Interceptors

According to assessments by U.S. military and intelligence officials as well as by independent experts, the Chinese probably destroyed their weather satellite with a kinetic-energy vehicle boosted by a two-stage medium-range ballistic missile. Technologically, launching such direct-ascent antisatellite weapons is one of the simplest ways to take out a satellite. About a dozen nations and consortia can reach low Earth orbit (between roughly 100 and 2,000 kilometers, or 60 to 1,250 miles, high) with a medium-range missile; eight of those countries can reach geostationary orbit (about 36,000 kilometers, or 22,000 miles, above Earth).

But the real technical hurdle to making a hit-to-kill vehicle is not launch capacity; it is the precision maneuverability and guidance technology needed to steer the vehicle into its target. Just how well China has mastered those techniques is unclear. Because the weather satellite was still operating when it was destroyed, the Chinese operators would have known its exact location at all times.

Ground-Based Lasers

The test of China’s direct-ascent antisatellite device came on the heels of press reports in September 2006 that the Chinese had also managed to “paint,” or illuminate, U.S. spy satellites with a ground-based laser [see lower box on page 83]. Was Beijing actually trying to “blind” or otherwise damage the satellites? No one knows, and no consensus seems to have emerged in official Washington circles about the Chinese intent. Per­haps China was simply testing how well its network of low-power laser-ranging stations could track American orbital observation platforms.

Even so, the test was provocative. Not all satellites have to be electronically “fried” to be put out of commission. A 1997 test of the army’s MIRACL system (for midinfrared advanced chemical laser) showed that satellites designed to collect optical images can be temporarily disrupted—dazzled—by low-power beams. It follows that among the satellites vulnerable to such an attack are the orbital spies.

The U.S. and the former Soviet Union began experimenting with laser-based antisatellite weapons in the 1970s. Engineers in both countries have focused on the many problems of building high-power laser systems that could reliably destroy low-flying satellites from the ground. Such systems could be guided by “adaptive optics”: deformable mirrors that can continuously compensate for atmospheric distortions. But tremendous amounts of energy would be needed to feed high-power lasers, and even then the range and effectiveness of the beams would be severely limited by dispersion, by attenuation as they passed through smoke or clouds, and by the difficulty of keeping the beams on-target long enough to do damage.

During the development of the SDI, the U.S. conducted several laser experiments from Hawaii, including a test in which a beam was bounced off a mirror mounted on a satellite. Laser experiments continue at the Starfire Optical Range at Kirtland Air Force Base in New Mexico. Pentagon budget documents from fiscal years 2004 through 2007 listed antisatellite operations among the goals of the Starfire research, but that language was removed from budget documents in fiscal year 2008 after Congress made inquiries. The Starfire system incorporates adaptive optics that narrow the outgoing laser beam and thus increase the density of its power. That capability is not required for imagery or tracking, further suggesting that Starfire could be used as a weapon.

Yet despite decades of work, battle-ready versions of directed-energy weapons still seem far away. An air force planning document, for instance, predicted in 2003 that a ground-based weapon able to “propagate laser beams through the atmosphere to [stun or kill low Earth orbit] satellites” could be available between 2015 and 2030. Given the current state of research, even those dates seem optimistic.

Co-orbital Satellites

Recent advances in miniaturized sensors, powerful onboard computers and efficient rocket thrusters have made a third kind of antisatellite technology increasingly feasible: the offensive microsatellite. One example that demonstrates the potential is the air force’s experimental satellite series (XSS) project, which is developing microsatellites intended to conduct “autonomous proximity operations” around larger satellites. The first two microsatellites in the program, the XSS-10 and XSS-11, were launched in 2003 and 2005. Though ostensibly intended to inspect larger satellites, such microsatellites could also ram target satellites or carry explosives or directed-energy payloads such as radio-frequency jamming systems or high-powered microwave emitters. Air force budget documents show that the XSS effort is tied to a program called Advanced Weapons Technology, which is dedicated to research on military laser and microwave systems.

During the cold war the Soviet Union developed, tested and even declared operational a co-orbital antisatellite system—a maneuverable interceptor with an explosive payload that was launched by missile into an orbit near a target satellite in low Earth orbit. In effect, the device was a smart “space mine,” but it was last demonstrated in 1982 and is probably no longer working. Today such an interceptor would likely be a microsatellite that could be parked in an orbit that would cross the orbits of several of its potential targets. It could then be activated on command during a close encounter.

In 2005 the air force described a program that would provide “localized” space “situational awareness” and “anomaly characterization” for friendly host satellites in geostationary orbit. The program is dubbed ANGELS (for autonomous nanosatellite guardian for evaluating local space), and the budget line believed to represent it focuses on acquiring “high value space asset defensive capabilities,” including a “warning sensor for detection of a direct ascent or co-orbital vehicle.” It is clear that such guardian nanosatellites could also serve as offensive weapons if they were maneuvered close to enemy satellites.

And the list goes on. A “parasitic satellite” would shadow or even attach itself to a target in geostationary orbit. Farsat, which was mentioned in an appendix to the [Donald] Rumsfeld Space Commission report in 2001, “would be placed in a ‘storage’ orbit (perhaps with many microsatellites housed inside) relatively far from its target but ready to be maneuvered in for a kill.”

Finally, the air force proposed some time ago a space-based radio-frequency weapon system, which “would be a constellation of satellites containing high-power radio-frequency transmitters that possess the capability to disrupt/­destroy/disable a wide variety of electronics and national-level command and control systems.”

Air force planning documents from 2003 envisioned that such a technology would emerge after 2015. But outside experts think that orbital radio-frequency and microwave weapons are technically feasible today and could be deployed in the relatively near future.

Space Bombers

Though not by definition a space weapon, the Pentagon’s Common Aero Vehicle/Hypersonic Technology Vehicle (often called CAV) enters into this discussion because, like an ICBM, it would travel through space to strike Earth-bound targets. An unpowered but highly maneuverable hypersonic glide vehicle, the CAV would be deployed from a future hypersonic space plane, swoop down into the atmosphere from orbit and drop conventional bombs on ground targets. Congress recently began funding the project but, to avoid stoking a potential arms race in space, has prohibited any work to place weapons on the CAV. Although engineers are making steady progress on the key technologies for the CAV program, both the vehicle and its space plane mothership are still likely decades off.

Some of the congressional sensitivity to the design of the CAV may have arisen from another, much more controversial space weapons concept with parallel goals: hypervelocity rod bundles that would be dropped to Earth from orbital platforms. For decades air force planners have been thinking about placing weapons in orbit that could strike terrestrial targets, particularly buried, “hardened” bunkers and caches of weapons of mass destruction. Commonly called “rods from God,” the bundles would be made up of large tungsten rods, each as long as six meters (20 feet) and 30 centimeters (12 inches) across. Each rod would be hurled downward from an orbiting spacecraft and guided to its target at tremendous speed.

Both high costs and the laws of physics, however, challenge their feasibility. Ensuring that the projectiles do not burn up or deform from reentry friction while sustaining a precise, nearly vertical flight path would be extremely difficult. Calculations indicate that the nonexplosive rods would probably be no more effective than more conventional munitions. Furthermore, the expense of lofting the heavy projectiles into orbit would be exorbitant. Thus, despite continued interest in them, rods from God seem to fall into the realm of science fiction.

Obstacles to Space Weapons

What, then, is holding the U.S. (and other nations) back from a full-bore pursuit of space weapons? The countervailing pressures are threefold: political opposition, technological challenges and high costs.

The American body politic is deeply divided over the wisdom of making space warfare a part of the national military strategy. The risks are manifold. I remarked earlier on the general instabilities of an arms race, but there is a further issue of stability among the nuclear powers. Early-warning and spy satellites have traditionally played a crucial role in reducing fears of a surprise nuclear attack. But if antisatellite weapons disabled those eyes-in-the-sky, the resulting uncertainty and distrust could rapidly lead to catastrophe.

One of the most serious technological challenges posed by space weapons is the proliferation of space debris, to which I alluded earlier. According to investigators at the air force, NASA and Celestrak (an independent space-monitoring Web site), the Chinese antisatellite test left more than 2,000 pieces of junk, baseball-size and larger, orbiting the globe in a cloud that lies between about 200 kilometers (125 miles) and 4,000 kilometers (2,500 miles) above Earth’s surface. Perhaps another 150,000 objects that are a centimeter (half an inch) across and larger were released. High orbital velocities make even tiny pieces of space junk dangerous to spacecraft of all kinds. And ground stations cannot reliably monitor or track objects smaller than about five centimeters (two inches) across in low Earth orbit (around a meter in geostationary orbit), a capability that might enable satellites to maneuver out of the way. To avoid being damaged by the Chinese space debris, in fact, two U.S. satellites had to alter course. Any shooting war in space would raise the specter of a polluted space environment no longer navigable by Earth-orbiting satellites.

Basing weapons in orbit also pre­sents difficult technical obstacles. They would be just as vulnerable as satellites are to all kinds of outside agents: space debris, projectiles, electromagnetic signals, even natural micrometeoroids. Shielding space weapons against such threats would also be impractical, mostly because shielding is bulky and adds mass, thereby greatly increasing launch costs. Orbital weapons would be mostly autonomous mechanisms, which would make operational errors and failures likely. The paths of objects in orbit are relatively easy to predict, which would make hiding large weapons problematic. And because satellites in low Earth orbit are overhead for only a few minutes at a time, keeping one of them constantly in range would require many weapons.

Finally, getting into space and operating there is extremely expensive: between $2,000 and $10,000 a pound to reach low Earth orbit and between $15,000 and $20,000 a pound for geostationary orbit. Each space-based weapon would require replacement every seven to 15 years, and in-orbit repairs would not be cheap, either.

Alternatives to Space Warfare

Given the risks of space warfare to national and international security, as well as the technical and financial hurdles that must be overcome, it would seem only prudent for spacefaring nations to find ways to prevent an arms race in space. The U.S. focus has been to reduce the vulnerability of its satellite fleet and explore alternatives to its dependence on satellite services. Most other space-capable countries are instead seeking multilateral diplomatic and legal measures. The options range from treaties that would ban antisatellite and space-based weapons to voluntary measures that would help build transparency and mutual confidence.

The Bush administration has adamantly opposed any form of negotiations regarding space weapons. Opponents of multilateral space weapons agreements contend that others (particularly China) will sign up but build secret arsenals at the same time, because such treaty violations cannot be detected. They argue further that the U.S. cannot sit idly as potential adversaries gain spaceborne resources that could enhance their terrestrial combat capabilities.

Proponents of international treaties counter that **failure to negotiate** such agreements entails real opportunity costs. An arms race in space may end up **compromising the security of all nations**, including that of the U.S., while it stretches the economic capacities of the competitors to the breaking point. And whereas many advocates of a space weapons ban concede that it will be difficult to construct a fully verifiable treaty—because space technology can be used for both military and civilian ends—effective treaties already exist that do not require strict verification. A good example is the Biological Weapons Convention. Certainly a prohibition on the testing and use (as opposed to the deployment) of the most dangerous class of near-term space weapons—destructive (as opposed to jamming) antisatellite systems—would be easily verifiable, because earthbound observers can readily detect orbital debris. Furthermore, any party to a treaty would know that all its space launches would be tracked from the ground, and any suspicious object in orbit would promptly be labeled as such. The **international outcry** that would ensue from **such overt treaty violations** could deter would-be violators.

Since the mid-1990s, however, progress on establishing a new multilateral space regime has lagged. The U.S. has blocked efforts at the United Nations Conference on Disarmament in Geneva to begin negotiations on a treaty to ban space weapons. China, meanwhile, has refused to accept anything less. Hence, intermediate measures such as voluntary confidence-building, space traffic control or a code of responsible conduct for spacefaring nations have remained stalled.

Space warfare is not inevitable. But the recent policy shift in the U.S. and China’s provocative actions have highlighted the fact that the world is approaching a **crossroads**. Countries must come to grips with their strong self-interest in preventing the testing and use of orbital weapons. The nations of Earth must soon decide whether it is possible to sustain the predominantly peaceful human space exploration that has already lasted half a century. The likely alternative would be **unacceptable to all**.

#### Space arms racing spills over to South Asia---escalates the nuclear security trilemma.

Zulfqar Khan 19. Senior Analyst, Pakistan Ministry of Defence and Visiting Fellow, Islamabad Policy Research Institute; with Ahmad Khan. “Space Security Trilemma in South Asia.” http://pakistanpolitico.com/space-security-trilemma-in-south-asia/

The peculiar nature of bilateral relations between the United States and China in space is the triggering point of a space security trilemma in South Asia. The spillover effect of a misperception-misunderstanding dynamic between the United States and China in outer space has brought strategic transformation between the bilateral relations among India-China, India-Pakistan, and China Pakistan, accentuating a security trilemma. All three states give high importance to their national space programs to achieve socio economic goals and to fulfil their national security needs. All three states also recognize the strategic importance of space as a new arena of war. However, the power asymmetry in South Asia has highlighted space-related capabilities as a potent medium of progress and power accumulation. As a result, the challenges in space have triggered and magnified the security trilemma for the South Asian rivals, interconnecting China, India, and Pakistan in the context of an international security complex.

The concept of a security trilemma was primarily conceived by Linton Brooks and Mira Rapp-Hooper in their scholarly work titled, ‘Strategic Asia 2013-2014: Asia in the Second Nuclear Age.’ Brooks and Rapp-Hooper argue that the concept is applicable to South Asia, where the three nuclear powers of China, India, and Pakistan interact in a triangular security matrix that is formed around the imperative of an offense-defence security environment. The theme of a security trilemma is based on the relations among India and Pakistan, China and India, China and Pakistan, and China and the United States.

South Asia has remained a region of concern for the international community, particularly for the United States in the past, and it is likely to remain so in the future. This reflects the importance of the South Asian region in the world politics and U.S. foreign security policy calculus, primarily due to its political, strategic, and economic significance, as well as the interests of other states associated with the region. The United States and India presently have a convergence of geostrategic interests in the region that has led to realignment of their strategic relations. On the other hand, the United States and Pakistan have unstable relations due to multiple factors, including the presence of U.S. and coalition forces in Afghanistan, and due to terrorism. The most interesting factor is U.S. rebalance policy in the region, which envisions containing the rise of China and where India is playing an instrumental role in helping the United States to achieve its strategic interests in the region. This constitutes a strategic chain reaction when China tries to balance its relations with the United States, which, in turn, negatively impacts its relations with India, which disturbs its relations with Pakistan. This causes a ripple effect in the bilateral relations between China-India, India-Pakistan, and China-United States.

Space is a strategic domain. It is also one of the most important global commons, most notably in the twenty-first century technologically driven security world where the future of geostrategic affairs is expected to be largely determined by the technological, cyber, and space capabilities of competing states. Strategically, space has become the fourth medium of warfare, in addition to land, sea, and air mediums. Concomitantly, space is analogous to these more traditional mediums. Overall, the strategic importance of space for the major powers has increased substantially since the launch of the first satellite into outer space in 1957. Hence,the value and reliance on space capabilities and their applications in the realms of communication networking, navigation, intelligence gathering, photographic reconnaissance, surveillance, and early warning purposes have increased manifold for the major powers and other state actors.

In the twenty-first century, states aspire to accumulate power and influence over economic, political, and technological areas, as well as military power and space power. All of this is considered synonymous with the symbols of power and prestige for technologically advanced states. The desire to gather power is akin to technological advancement. However, technological advancement cannot be achieved without exploration of space for peaceful, strategic, and military uses to achieve states’ national security goals. Space has strategic connotations for both spacefaring and non-spacefaring states because space related capability has emerged as a potent medium of progress and power. The uses of the global commons of space for various conflicting objectives are emerging as a potential cause of future conflicts. In addition, space politics at the global level among the major spacefaring states impacts international and regional security environments, particularly in South Asia. The ongoing space competition between the United States and China has created a space security trilemma for Pakistan and India. This is primarily due to international and regional geostrategic transformations that are rooted in the Indo-U.S. space and strategic partnerships. This, in turn, impacts the security dynamics of South Asia, and negatively affects Pakistan, which is at a power disadvantage in comparison to India.

The utilization of space power for states’ national defence has become an integral part of the national security strategy for India and Pakistan. In this regard, India is also focusing on expanding the orbit of its space program for national defence and power projection goals. This will prompt Pakistan to follow suit. The primary factor behind India’s growing space progress is partly due to its perceived fear of China’s expanding space program, and the latter’s growing militarization and weaponization capabilities. On the other hand, China’s primary concern is U.S. space weaponization capabilities. The concerns, vulnerabilities, and challenges in space trigger and magnify the security trilemma for these South Asian rivals, interconnecting China, India, and Pakistan in the context of an international security complex. This causes geopolitical dynamics and predicaments, such as China versus the United States, India versus China, and Pakistan versus India. Moreover, India has accelerated its space cooperation with the United States and other countries that will complement its BMD systems, which, from a Pakistani perspective, is a potent security threat and a destabilizing development that undermines the strategic stability of South Asia. Such developments place Pakistan under the sway of India’s increasing military and space dominance in the region. In sum, the space and technological programs of the United States, China, and India magnify the security trilemma between the regional states in South Asia.

#### Extinction.

Raja Qaiser Ahmed 17. Lecturer in the School of Politics and International Relations, Quaid I Azam University, Islamabad, Pakistan; with Misbah Arif, Visiting Lecturer in the Department of Defence and Diplomatic Studies at Fatima Jinnah Women University; 2017, “Space Militarization in South Asia: India’s Quest for Space Weapons and Implications for Pakistan,” Asian Survey, Vol. 57, No. 5, doi:10.1525/as.2017.57.5.813

The strategic environment of South Asia is complex, ambiguous, volatile, and unpredictable. South Asia is an important region geostrategically and geopolitically. The stability and security of the region are dependent on Indo–Pakistani relations, which have been strained for many years. The conventional asymmetry led to Pakistan’s reliance on nuclear weapons and a first-use policy. The nuclear deterrence between the two has been successful: no major war has occurred since nuclearization (aside from the Kargil standoff). Through its nuclear posture Islamabad has been able to achieve objectives like dissuading the enemy from considering aggression, deterring potential enemies, reducing dependence on allies, and militaryindependence.46 Pakistan has been trying to preserve the credibility of its minimum nuclear deterrent since 1998. Pakistan’s proposed Strategic Restraint Regime would ban anti-ballistic missiles and submarinelaunched missiles in the region.47 But India rejected the proposal, wanting to balance the growing Chinese military muscle and engaging Pakistan in an expensive arms race.

India’s space weapons program will solidify its defense and increase its options. It will also have serious repercussions for Indo–Pakistani relations and strategic stability in South Asia. It will heighten the asymmetry between the declared rivals, India and Pakistan. Further advancement and deployment of Agni V will give New Delhi second-strike capability. This will obviously have a negative effect on Pakistan’s security. Pakistan’s space program is only in its initial phases. India is very far ahead, and its rapid advancement in the field of space is alarming for Pakistan.

To preserve its space assets, India has showed interest in building satellite killer devices, lasers, and military satellites to support Indian forces. Space weapons are unpredictable and fragile. It will be disastrous for mankind if these weapons are placed in outer space. To attain space dominance by developing such dangerous weapons would not be a rational approach. It is therefore recommended that alternative options be considered. India’s space weapons would have direct implications for Pakistan in particular. Indian activities in space will force Pakistan to make changes in its nuclear posture, imperiling stability and security.

Indian space weaponization will force Pakistan to take measures to strengthen its defense forces. India’s having information about silos and the movement of troops, along with the ability to hit them, will require precautionary measures from Pakistan. Technological developments in the Indian space program could be a great threat to Pakistan, so the Pakistani government must now pay full attention to its space satellite program, to counter the Indian hegemonic space threat, and not always rely on the US and China. Pakistan receives technology from the US and China and does not possess indigenous technology production. Pakistan’s F-16s were provided by the US, and Pakistan’s space program is largely contingent on China’s help. Plansshould be made to speed the development of Pakistan’s space program. India has always impelled Pakistan to take defensive security measures, as it did in 1998, when Pakistan had to test nuclear weapons in the aftermath of India’s nuclear tests.

Pakistan doesn’t have its own launch vehicles or a launch pad for space vehicles. Pakistan needs to have its own launch vehicle and a geographically suitable place to build a launch pad. It is time for Pakistan to have an indigenous space program, not reliant on anyone else. Given the changing geostrategic environment, Pakistan must focus on internal balancing.

India is working on expanding its conventional and nonconventional military might, as is evident in its rising defense budget allocations. Pakistan needs to pay special attention to this trend. Pakistan needs to work on a more robust nuclear triad with the development of nuclear submarines. Pakistan has made a significant development in this regard, with the successful test of its Nasr solid-fueled multi-tube tactical ballistic missile. Pakistan should go for nuclear submarines, which are hard to detect and can remain underwater for long periods. It must devise ways to overcome the economic challenge, to meet these increasing defense demands. And Pakistan can take this issue to the United Nations with the collaboration of other states, as its adversarial relations with India endanger the security of all states.

The prevailing strategic environment will force Pakistan to take measures to counter the threats to its security. The measures will trigger an arms race in outer space and will create further instability in an already vulnerable South Asia. Efforts should be made at the global level to curb the proliferation of weapons in space, which is a global common and should be prevented from becoming a battleground.

India’s space program is growing at a very brisk pace. The main regional issues of South Asia pivot around India–Pakistan rivalry. Space weaponization in South Asia will have dire implications for strategic stability. India’s quest for space weaponization is motivated by aspiration for supremacy and regional hegemony. India also wants to balance its capabilities with those of China to counter China’s growing influence in South Asia. Closer analysis of the issue suggests that given the historical relations between India and Pakistan, India’s quest for space weaponization will threaten the security of the region.

### SSA ADV---Space Governance Turn---2NC

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

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

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

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

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

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

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

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

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

#### Turns case.

Gareth Dorrian & Ian Whittaker, 19 (Gareth Dorrian; PhD in Solar Terrestrial Physics and writer of public outreach articles for The Conversation, Ian Whittaker; Senior Lecturer at the School of Science & Technology at Nottingham Trust University, 10-21-2019, accessed on 7-3-2022, Phys.org, “Space may soon become a war zone – here's how that would work”, <https://phys.org/news/2019-10-space-war-zone.html>, HBisevac)

But how would **sabotage** and **warfare** happen exactly? One method involves firing an **intense beam** of **microwave radiation** at an object. In fact, such concepts have been tested before by the police as a means of bringing a speeding car to a halt by disabling electrical devices on the vehicle.

Such a concept deployed on satellites would constitute a "**directed-energy weapon**", enabling nations to disable other countries' satellites without creating large clouds of orbital debris. You could potentially make such an attack look like an accident and deny involvement.

The use of "**radio jamming**" to disrupt radar and communications dates back to World War II. By swamping a radio receiver with, effectively, radio noise, one can obscure the reception of genuine signals and render the system **inoperative**. This is a little like trying to spot the light from a candle against the glare of car headlights.

Satellites are thoroughly tested for self generated radio noise before going into space. But if a "hostile" satellite nearby were to deliberately direct broadband radio transmissions at the target satellite, then communications could be completely disrupted.

Space-based electronic warfare is likely to become an increasing concern for military planners. In fact, many military services on Earth now depend on space technology to work.

Kinetic kills and lasers

By far the most obvious method of interfering with a satellite is a solid projectile. Moving satellites have very high **kinetic energy** and **momentum**. If a slower moving object can be placed briefly in the path of a satellite, then the resultant **collision** will be particularly **devastating**.

These so called "kinetic kills" have previously only been used to take satellites out of commission at the end of their life, with the US, Russia China, and India demonstrating their ability to perform this. This type of removal consists of a ground-launched missile aimed at the satellite. If aimed at an adversary satellite, such a missile would be fairly obvious and could be tracked by other nations using radar.

A more subtle method would be to destroy a satellite owned by the country or company launching the missile and aim to produce as much debris as possible, which then lies in the orbital path of the intended target. This could look like an accident and actually accidently occurred in 2007.

As far as kinetic weapons in space are concerned, machine guns are generally problematic due to the recoil involved. If the weapon is fired at any angle which is not in the exact direction of the orbital path the satellite is travelling along, then a torque will be applied, rapidly changing the direction of it. The idea of kinetic weapons has been attempted before. The Soviet space station Salyut-3, for example, was armed with a rapid fire cannon in the mid 1970s.

**Lasers** are also being considered as defensive weapons, with the idea being to take out attacking satellites' solar panels. With no power, the satellite will be **unable** to **communicate** with the ground station and is essentially lost. The **recoil** from a laser is **much smaller** and the lack of atmosphere would allow them to perform **better** than on the Earth's surface.

A laser could be used to blind instrumentation on an opposing satellite thereby reducing the efficacy of either **rendezvous** or **aiming software**.

The most likely satellites to be targeted would be those dedicated to **communication** or **observing**. With the newest research satellites able to take images down to a 30cm resolution, military versions are likely to be even better. A nation with no communication facilities or ability to observe others will never know who has launched an attack against them.

But what would a space war look like from Earth? While sci-fi films have conditioned us to believe that space lasers would use visible light, shorter wavelengths actually produce more power. Any observers on the surface would be unlikely to directly see any effects from space warfare, unless a kinetic kill actually breaks a spacecraft up—with debris lighting up as it re-enters the atmosphere. That said, attacks could still affect our lives on Earth, disturbing GPS, television services and even cash withdrawals.

Nuclear weapons?

The use of nuclear weapons and weapons of mass destruction in space is currently banned under the Outer Space Treaty and the Comprehensive Nuclear-Test Ban Treaty. But not all nuclear armed nations have ratified the latter, including the US and North Korea.

A small number of nuclear tests in space were conducted in the 1960s including Starfish Prime. These resulted in artificial radiation belts forming around the Earth which were still detectable decades after the event—posing a danger for astronauts.

These **radiation belts** also disabled half a dozen satellites in **l**ow **E**arth **o**rbit. If the results of Starfish Prime are anything to go by, then clearly it would take only a **handful** of nuclear detonations to make space **unusable** for any satellites for decades to come.

### SSA ADV---Arctic Defense---1NC

#### No Arctic War---cooperation and location check

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It would be easy to become pessimistic about Arctic military stability; we are not. International conflict in the region is unlikely because the Arctic nations are committed to a rules-based approach to security. Worries about the potential for conflict over seabed rights in the Arctic are misplaced.6 War is far less likely above the Arctic Circle than in nearly any other part of the world.7 Cooperation is breaking out everywhere in the region; international law is followed; there is no political vacuum.8 While elsewhere Russia is exhibiting its propensity toward military displays, in the Arctic, Russia is playing a constructive role in maintaining regional stability. Russia is intently focused on regional security in part because it sees in the Arctic an opportunity to recapture the former influence and superpower standing that it enjoyed during the Cold War. Russia strategically and successfully takes advantage of its dominant geographic posi- tion surrounding 170 degrees of the Arctic Circle, and its energy and economic presence in the region dwarfs that of all other Arctic states combined. The United States and Russia enjoy a pragmatic working relationship in managing the security of the Bering Strait.9 The U.S. Coast Guard and Russian Border Patrol have cooperated for nearly two decades under a bilateral treaty to manage safety and security in the 53-mile-wide strait.10 The neighbors also jointly led negotiations among all eight Arctic states to adopt binding agreements on search and rescue and oil spill preparedness and response. Now the United States and Russia are leading efforts to adopt agreements on marine pol- lution prevention and marine scientific research in the region. The remoteness and physical isolation of the Arctic region also reduces military risk. Arctic states find comfort in their exclusive and shared geogra- phy. They are united to resist efforts from outside the region that might erode, let alone upend, the contemporary order. The one thing all Arctic states have in common is a rather circumspect view of states from outside the region that seek to play a greater role in the Arctic. Furthermore, all Arctic states are invested in a rules-based approach to stability and security, based principally on the United Nations Convention on the Law of the Sea (UNCLOS).11 The consensus among Arctic states that UNCLOS is the framework for distribution of rights and duties in the region minimizes risk of conflict over maritime boundaries. Every Arctic nation is a party to the treaty except the United States, which, since 1983, has made a commitment to adhere to most provi- sions of the treaty.12 Finally, the likelihood of conflict breaking out over the region’s vast offshore resources is also remote since Arctic states are pursuing their maritime claims through the multilateral Commission on the Limits of the Continental Shelf (CLCS), an independent international technical body estab- lished by UNCLOS. Every Arctic coastal state except the United States has submitted at least partial information for consideration of a claim to sovereign rights over seabed riches of oil, gas and minerals. To the extent that overlapping maritime claims exist, the four other Arctic Ocean coastal states, including Russia, are proceeding with deliberate professionalism in appropriate bilateral forums and with the CLCS to resolve them.13 In 2010, Russia and Norway, for example, signed a treaty to resolve their 40-year disagreement over maritime resource boundaries in the Barents Sea. More recently, Denmark and Canada established maritime delimitation in the Lincoln Sea, north- west of Greenland. Similarly, Canada and the United States are exploring a way ahead to resolve a benign disagreement over a single boundary line in the Beaufort Sea.

### SSA ADV---Arctic Defense---2NC

#### No Arctic war.

Bartelet & Dubois 18, \*Henry Bartelet is the Founder and Commercial Director of DynaMundo, a Seattle-based think tank. \*\*Kenty Dubois is a Fellow at DynaMundo where he works on a set of policy-oriented research dealing with the Arctic Region. (1-12-2018, "The Arctic Between Hype and Reality", *Polar Connection*, https://polarconnection.org/arctic-geopolitics/)

A Battle for Resources?

Most of the resources in the Arctic are to be found in countries within territorial seas or exclusive economic zones. Since all the Arctic States have pledged to respect UNCLOS in the Illulissat Declaration, there is very little chance of conflict. The principle of precaution seems to be the reason explaining the disputes about the delimitation of the extended continental shelves, in case something would be found even if it is unlikely. Some feared that a “resources driven conflict” would occur in the Circumpolar North after the outbreak of the Ukrainian Crisis; the phenomenon did not occur. The reason is that for its own development, Moscow needs the region to remain peaceful (Käpylä & Mikkola 2015; Rahbek-Clemmensen 2015). Given Gazprom’s earlier decision to involve the Norwegian StatoilHydro in the development phase of its Arctic Shtokman gas field, it can even be argued that Russia will need to cooperate with its Arctic neighbours to develop its Arctic resources successfully.

Currently, the main producer of petroleum in the Arctic is Russia, where the offshore Prirazlomnoye field in the Pechora Sea is operated by Gazprom Neft. This field, which began commercial production in 2013, had an output of 2.1 million tons of Arctic oil in 2016. In March 2016, the Goliat field in Norway, a joint venture between Eni and Statoil, started production of Arctic oil. This field will produce 100,000 barrels of oil per day. With regards to natural gas, the Snøhvit gas field operated by Statoil represents the first and primary offshore development in the Arctic Barents Sea. The giant Russian natural gas field of Shtokman has dealt with several setbacks mostly from technological challenges, cost overruns and low gas prices. The cooperation agreement with European partners Total and Statoil expired in 2012 and further project development and production start is delayed until further notice. Another major Arctic Russian natural gas field, Yamal, has experienced similar setbacks in development. However, as of April 2014, the field operated by Novatek plans to start producing gas condensate.

In the North American Arctic, increased Arctic natural gas production can become a reality with the proposed investments in the ‘Alaska Pipeline Project’ through a consortium involving ExxonMobil, ConocoPhillips, BP and TransCanada. This major infrastructure project would make it possible to transport the natural gas in Alaska’s large Arctic reserves to markets in Canada and the United States. However, the planned continuation of this high investment project depends for a large part on high oil and gas prices. A prolonged period of low oil and gas prices could lead to a delay of the project which is proposed to begin transporting natural gas by 2025. The largest oil field in the American Arctic, in Prudhoe Bay, already reached peak production more than two decades ago. A second field in the Alaskan Arctic is the ‘Alpine field’, developed by ConocoPhillips and which has produced oil since 2000. The extent to which new production fields are to be developed in the Arctic is to a large extent dependent on a recovery of oil prices and domestic policies making a trade-off between environmental objections and the benefits of domestic resource production. In 2015, Royal Dutch Shell, one of the major players in the American Arctic, decided to abandon its drilling operations in the Arctic amid sustained low oil prices and rising pressure about environmental consequences. In October 2016, a large oil discovery was made in the Alaskan Arctic by Caelus Energy. This project, expected to start producing oil by 2022, could potentially offset some of the production declines from the other Arctic oil fields.

In Greenland, oil and gas development is a potential road towards full independence from the Kingdom of Denmark. To that purpose, a national oil company, Nunaoil, has been established; it has an automatic 12.5 percent stake in new oil exploration projects and an option to become a shareholder in oil projects which move to the development phase. Among the companies which have actively engaged in exploration activities in the Greenlandic Arctic are ExxonMobil, Chevron, Statoil, Husky Energy and Cairn Energy. However, also in Greenland, the drop in the oil price in 2014 has had a large effect on prospective Arctic oil exploration activities. Total petroleum prospecting, exploration and exploitation licences (in force) have decreased from nine in 2014 to three in 2015 and zero in 2016 (Mineral Licence and Safety Authority, 2017). The Scottish energy company Cairns Energy, one of the major players in Greenland’s petroleum exploration, is evaluating its Greenlandic portfolio as no commercial oil players have been found yet. In 2014, Statoil decided not to extend three of its four Greenlandic exploration licences.

Asian emerging powers have expressed their interest in Arctic resources. However, their contribution to Arctic economic development remains modest. China, Japan and South Korea are investing in resources exploration in Greenland (Tonami, 2016). Both China and Japan have expressed their will to cooperate with Russian companies and have also expressed their will to invest in the Yamal’s liquified natural gas exploitation. However, the discussions are advancing at a really slow pace. (Pollmann, 2016; Sorensen and Klimenko, 2017).

Arctic Militarisation?

If we analysed the numbers provided by the Stockholm International Peace Research Institute (Wezeman, October 16), we can see that Russia is leading in terms of air and sea capacities, while Canada has the strongest land capabilities but strongly lacks specific Arctic capacities such as icebreakers.

It is interesting to draw a comparison between the current military activities and the Cold War to get some more insight about what happens today in the Arctic. The numbers gathered by Lassi Heininen, Alexander Sergunin and Gleb Yarovoy:

If one observes the data closely, one can draw the following conclusion:

USSR’s presence in the 80s outnumbers the current Russian presence. The same can be said for the US.

NATO has more submarines, lager ships and aircraft that are Arctic capable than Russia. The mention “Arctic capable” is important; these forces can be elsewhere and are not permanently stationed in the region. Russia, thus, remains the strongest Arctic power.

Although there is a military presence, we cannot speak about a military theatre like the region has witnessed during the Cold War. The reason behind the Russian military presence in the region is threefold: 1) to assert Moscow’s sovereignty over the region 2) to protect the Russian companies operating in the region and 3) to show the entire world that Russia is still an Arctic power. Thus, the Russian military presence in the region is tied to prestige, economics and energy security. Unlike, the Cold War, the logic is not grounded in a bloc-to-bloc conflicts and deterrence (Heininen et al., 2014).

A few scholars have used the expression “Arctic exceptionalism” to speak about the lack of conflict in the Arctic. According to them, the Arctic’s current stability is explained by the lack of resources in contested areas or in the high seas3 and the capacity of regional fora, such as the Arctic Council, to defuse tension4 (Käpylä and Mikkola, 2016).

### SSA ADV---Space Col---Defense---1NC

#### Space cols impossible---resources and planet conditions

George Dvorsky 19 (George Dvorsky is a senior staff reporter at Gizmodo specializing in astronomy, space exploration, SETI, archaeology, bioethics, animal intelligence, human enhancement, and risks posed by AI and other advanced tech, 7/30/19, accessed 11/23/21, “Humans Will Never Colonize Mars”, https://gizmodo.com/humans-will-never-colonize-mars-1836316222)AGabay

The Red Planet is a **cold**, **dead place**, with an atmosphere about **100 times thinner** than Earth’s. The paltry amount of air that does exist on Mars is primarily composed of noxious carbon dioxide, which does little to **protect** the surface from the **Sun’s** harmful **rays**. Air pressure on Mars is very low; at 600 Pascals, it’s only about 0.6 percent that of Earth. You might as well be exposed to the vacuum of space, resulting in a severe form of the bends—including ruptured lungs, dangerously swollen skin and body tissue, and ultimately **death**. The thin atmosphere also means that heat cannot be retained at the surface. The average temperature on Mars is -81 degrees Fahrenheit (-63 degrees Celsius), with temperatures dropping as low as -195 degrees F (-126 degrees C). By contrast, the coldest temperature ever recorded on Earth was at Vostok Station in Antarctica, at -128 degrees F (-89 degrees C) on June 23, 1982. Once temperatures get below the -40 degrees F/C mark, people who aren’t properly dressed for the occasion can expect hypothermia to set in within about five to seven minutes. Mars also has less mass than is typically appreciated. Gravity on the Red Planet is 0.375 that of Earth’s, which means a 180-pound person on Earth would weigh a scant 68 pounds on Mars. While that might sound appealing, this low-gravity environment would likely wreak **havoc** to human health in the long term, and possibly have negative impacts on human **fertility**. Yet despite these and a plethora of other issues, there’s this popular idea floating around that we’ll soon be able to set up colonies on Mars with ease. SpaceX CEO Elon Musk is projecting colonies on Mars as early as the 2050s, while astrobiologist Lewis Darnell, a professor at the University of Westminster, has offered a more modest estimate, saying it’ll be about 50 to 100 years before “substantial numbers of people have moved to Mars to live in self-sustaining towns.” The United Arab Emirates is aiming to build a Martian city of 600,000 occupants by 2117, in one of the more ambitious visions of the future. Sadly, this is literally science fiction. While there’s no doubt in my mind that humans will eventually visit Mars and even build a base or two, the notion that we’ll soon set up colonies inhabited by hundreds or thousands of people is pure **nonsense**, and an unmitigated denial of the tremendous challenges posed by such a prospect. Pioneering astronautics engineer Louis Friedman, co-founder of the Planetary Society and author of Human Spaceflight: From Mars to the Stars, likens this unfounded enthusiasm to the unfulfilled visions proposed during the 1940s and 1950s. “Back then, cover stories of magazines like Popular Mechanics and Popular Science showed colonies under the oceans and in the Antarctic,” Friedman told Gizmodo. The feeling was that humans would find a way to occupy every nook and cranny of the planet, no matter how challenging or inhospitable, he said. “But this just hasn’t happened. We make occasional visits to Antarctica and we even have some bases there, but that’s about it. Under the oceans it’s even worse, with some limited human operations, but in reality it’s really very, very little.” As for human colonies in either of these environments, not so much. In fact, not at all, despite the relative ease at which we could achieve this. After the Moon landings, Friedman said he and his colleagues were hugely optimistic about the future, believing “we would do more and more things, such as place colonies on Mars and the Moon,” but the “fact is, no human spaceflight **program**, whether Apollo, the Space Shuttle Program, or the International Space Station,” has established the necessary **groundwork** for setting up colonies on Mars, such as building the required **infrastructure**, finding **safe** and **viable ways** of **sourcing food** and **water**, mitigating the deleterious effects of **radiation** and **low gravity**, among other issues. Unlike other fields, development into human spaceflight, he said, “has become static.” Friedman agreed that we’ll likely build bases on Mars, but the “evidence of history” suggests colonization is **unlikely** for the foreseeable future. Neuroscientist Rachael Seidler from the University of Florida says many people today fail to appreciate how difficult it’ll be to sustain colonies on the Red Planet. “People like to be optimistic about the idea of colonizing Mars,” Seidler, a specialist in motor learning and the effects of microgravity on astronauts, told Gizmodo. “But it also sounds a bit pie-in-the-sky,” she said. “A lot of people approach it as thinking we shouldn’t limit ourselves based on practicalities, but I agree, there are a lot of potential negative physiological **consequences**.” Seidler said NASA and other space agencies are currently working very hard to create and test countermeasures for the various negative impacts of living on Mars. For example, astronauts on the ISS, who are subject to tremendous muscle and bone loss, try to counteract the effects by doing strength and aerobic training while up in space. As for treating the resulting negative health impacts, whether caused by long-duration stays on the ISS or from long-term living in the low-gravity environment of Mars, “we’re not there yet,” said Seidler. In his latest book, On the Future: Prospects for Humanity, cosmologist and astrophysicist Martin Rees addressed the issue of colonizing Mars rather succinctly: By 2100 thrill seekers... may have established ‘bases’ independent from the Earth—on Mars, or maybe on asteroids. Elon Musk (born in 1971) of SpaceX says he wants to die on Mars—but not on impact. But don’t ever expect mass **emigration** from Earth. And here I disagree strongly with Musk and with my late Cambridge colleague Stephen Hawking, who enthuse about rapid build-up of large-scale Martian communities. It’s a dangerous delusion to think that space offers an escape from Earth’s problems. We’ve got to solve these problems here. Coping with climate change may seem daunting, but it’s a doddle compared to **terraforming Mars**. No place in our solar system offers an environment even as clement as the Antarctic or the top of Everest. There’s no ‘**Planet B**’ for ordinary risk-averse people. Indeed, there’s the whole terraforming issue to consider. By terraforming, scientists are referring to the hypothetical prospect of **geoengineering** a planet to make it habitable for humans and other life. For Mars, that would mean the injection of **oxygen** and other **gases** into the atmosphere to raise surface temperature and air pressure, among other interventions. A common argument in favor of colonizing Mars is that it’ll allow us to begin the process of transforming the planet to a **habitable state**. This scenario has been tackled by a number of science fiction authors, including Kim Stanley Robinson in his acclaimed Mars Trilogy. But as Friedman told Gizmodo, “that’s thousands of years in the making at least.” Briony Horgan, assistant professor of planetary science at Purdue University, said Martian terraforming is a **pipedream**, a prospect that’s “way beyond any kind of **technology** we’re going to have **any time soon**,” she told Gizmodo. When it comes to terraforming Mars, there’s also the logistics to consider, and the materials available to the geoengineers who would dare to embark upon such a multi-generational project. In their 2018 Nature paper, Bruce Jakosky and Christopher Edwards from the University of Colorado, Boulder sought to understand how much carbon dioxide would be needed to increase the air pressure on Mars to the point where humans could work on the surface without having to wear pressure suits, and to increase temperature such that liquid water could exist and persist on the surface. Jakosky and Edwards concluded that there’s not nearly enough CO2 on Mars required for **terraforming**, and that future geoengineers would have to somehow import the required gases to do so.

### SSA ADV---Space Col---Defense---2NC

#### No continuous supply of materials

Levchenko et al. 19. Professors in the Plasma Sources and Applications Centre/Space Propulsion Centre, NIE, Nanyang Technological University. 2019. “Mars Colonization: Beyond Getting There.” Global Challenges, vol. 3, no. 1.

Settlement of Mars—is it a dream or a necessity? From scientific publications to public forms, there is certainly little consensus on whether colonization of Mars is necessary or even possible, with a rich diversity of opinions that range from categorical It is a necessity!20 to equally categorical Should Humans Colonize Other Planets? No.21 A strong proponent of the idea, Orwig puts forward five reasons for Mars colonization, implicitly stating that establishing a permanent colony of humans on Mars is no longer an option but a real necessity.20 Specifically, these arguments are: Survival of humans as a species; Exploring the potential of life on Mars to sustain humans; Using space technology to positively contribute to our quality of life, from health to minimizing and reversing negative aspects of anthropogenic activity of humans on Earth; Developing as a species; Gaining political and economic leadership. The first argument captures the essence of what most space colonization proponents feel—our ever growing environmental footprint threatens the survival of human race on Earth. Indeed, a large body of evidence points to human activity as the main cause of extinction of many species, with shrinking biodiversity and depleting resources threatening the very survival of humans on this planet. Colonization of other planets could potentially increase the probability of our survival. While being at the core of such ambitious projects as Mars One, a self‐sustained colony of any size on Mars is hardly feasible in the foreseeable future. Indeed, sustaining even a small number of colonists would require a continuous supply of food, oxygen, water and basic materials. At this stage, it is not clear whether it would be possible to establish a system that would generate these resources locally, or whether it would at least in part rely on the delivery of these resources (or essential components necessary for their local production) from Earth. Beyond the supply of these very basic resources, it would be quite challenging if not impossible for the colonists to independently produce hi‐tech but vitally important assets such as medicines, electronics and robotics systems, or advanced materials that provide us with a decent quality of life. In this case, would their existence become little more than the jogtrot of life, as compared with the standards expected at the Earth?22

Adam Morton 18. Visiting Emeritus Professor of Philosophy at the University of British Columbia. 10/15/2018. “Three: Problems with Colonies” Should We Colonize Other Planets?, John Wiley & Sons.

Worries about refuges To be refuges where humans can survive catastrophe on Earth, colonies on other planets must of course contain and sustain humans. That is the point. They must also be highly technological: surviving in an environment less hospitable than anywhere on Earth would need powerful resources. Mars does not have an atmosphere that we can breathe, does not support plants that we can eat, is very cold, has little usable water, and receives much less solar energy. It is hard to make an analogy with anywhere on Earth: combine the light levels of the deep ocean with the cold of the Antarctic, add radiation, and then exaggerate. (The pictures from the Martian Rovers are accurate as far as colour and illumination go, but we tend to project familiarity onto them, taking the atmosphere to be like air on Earth and reading the absence of snow and ice as warmth rather than the frozen desert that it really is. I know this is my own tendency until I catch myself.) The colony must from early on produce all its own food, water, and oxygen. This is not at all impossible, given sophisticated equipment, which has been tried out under desert and arctic conditions on Earth. But these conditions are not really that much like Mars, especially with respect to cold, dark, and radiation. The equipment must continue to function, indefinitely. So it must be possible to repair it without using supplies brought from Earth. So, until local manufacturing can take over, repair equipment and spare parts must be added to the list of things that must be sent with the colonists in the first place. And, easy to overlook, it adds to the number of people who must be sent. A modern technological society of a kind that can create and repair the kind of equipment we are talking about involves thousands of specialized skills. Some combinations of these can be compressed into a smaller number of people, but many are still needed. Robinson Crusoe would not last long on Mars. Questions about the number of people in a colony are crucial. Selfsufficiency requires a large number of people – say several hundred at the least. And long-term survival requires genetic diversity. If population sizes are too small, then inbreeding makes hereditary defects and infectious diseases more common. Moreover, with a small population size, random fluctuations can result in imbalanced numbers of males and females, leading to both a smaller number in the following generation and yet more reduced diversity. (A shortage of females is obviously more serious. A bias towards females would have obvious advantages. Perhaps in fact an ideal colony should be all female plus a genetically diverse sperm bank.) It has been estimated that in wild quadrupeds a population size of 500 to 1,000 is needed for long-term survival of a species, while the crews for the simulated Mars habitats on Earth have typically had six people! Humans already have a very low genetic diversity: pairs of chimpanzees in the same troops have on average more genetic diversity than pairs of humans on Earth. The crews would have to be carefully chosen. A very special psychological makeup is needed. Crew members must endure close quarters with a small number of others, a very basic life, the knowledge that one has left one's family and friends behind, and a high risk of death. They must also be chosen so that there is a range of technical knowledge, improvisational skills, and the emotional and cultural makeup needed for something like Earth civilization to continue. And this must reproduce itself for generations. It is unlikely that, even if an optimum mix of people were achieved in the initial crew, the same mix would be preserved in subsequent generations. This too argues for larger population sizes. But the more people there are, the greater the expense and resources needed to establish the colony in the first place. A disturbing fact about the production of food on Mars has recently emerged. The soil on Mars is rich in compounds called perchlorates. They react with ultraviolet light, to which the Martian atmosphere is largely transparent, in a way that is fatal to many cells. There is thus a lot of doubt whether plant crops, and the symbiotic bacteria that many of them need, can survive in Martian soil. This complicates ambitions for indoor farming considerably. Because of the effects on both living cells and human health, perchlorate contamination is regarded as pollution on Earth. Perchlorates also have a risk of explosion when they are heated, complicating plans to produce oxygen by heating the Martian soil. They are, however, a source of oxygen and of other basic chemicals; although dangerous they could have their uses. There are surely high-tech solutions to this problem, but equally surely they raise the stakes for transport and technology and increase the danger. The complexity of technological society There is a fundamental fact behind many of these problems: the large scale and interdependence of our society, with its complex web of manufacturing techniques and expertise held in the minds of many people. It is extremely hard to duplicate this in a small population with restricted resources, especially in a hostile and unfamiliar environment. So dependence on the mother culture is hard to avoid. (This was true in the past, also. The early European colonies in North America did not make their own muskets until they had grown quite large, and European agricultural styles took a lot of adapting. This may not seem advanced technology. But could you make a musket? For that matter, could you make a stone axe?) This means that the high-tech devices needed to survive in the Martian environment are not going to be designed there. The designs are going to come from home. And it is likely that at least a proportion of the devices themselves will also. 3D printing from transmitted designs may solve some problems, though, if the raw materials can be obtained and refined on Mars. (I would imagine that supplies of direct and indirect biological material, such as the petroleum and oil products that are used to make plastics, might pose a serious problem.) If imported equipment is unsuitable or does not work because of some unexpected quirk of the faraway environment, much of it will have to be redesigned and manufactured not where it is needed but where the techniques and expertise are to be found. The more advanced the apparatus (the higher the tech), the more will need to be transported to the colony, adding to the transport costs and creating a need for spares. For all these reasons I am extremely sceptical that a colony of the size that we could send to Mars in the next decades, perhaps in the next century, could sustain itself without frequent supplies and reinforcements from Earth. The obvious reply to this is to drop the requirement that the colony be able to survive without the supplies and reinforcements. But this would undercut one of the main purposes – that of providing a remnant of humanity on Mars with a reasonable chance of surviving an earthly catastrophe. The colony would then be a scientific expedition and the beginning of a preparatory project that might take centuries.

#### Radiation, bone loss, and no reproduction---makes space colonies unsustainable and unlivable

Konrad Szocik et al., 18 (Konrad Szocik, University of Information Technology and Management in Rzeszow, Department of Philosophy and Cognitive Science, Rafael E. Marques, Steven Abood, Aleksandra Kedzior, Kateryna Lysenko-Ryba, Dobrochna Minich, June 2018, accessed on 12-19-2021, Futures, "Biological and social challenges of human reproduction in a long-term Mars base", https://www.sciencedirect.com/science/article/abs/pii/S0016328717300137, HBisevac)

Pregnancy is the **sole mean** of human reproduction, and is **key** to long-term colonization of Mars. Unfortunately, pregnancy is **risky** and may pose **serious hazards** to women’s **health**, especially in an **extraterrestrial environment**. Deep-space missions require astronauts to be at **peak physical condition** and **perfect health** (Crucian et al., 2016; Hackney et al., 2015). During travel, astronauts may experience motion sickness, headaches, body pain, diseases and genitourinary problems, among several other pathologies (Ertl et al., 2002; Rummel, Michel, Sawin, & Buderer, 1976). On their return to Earth, astronauts stationed at the ISS presented with muscle and bone loss (Chang et al., 2016), immunosuppression (Mukhopadhyay et al., 2016) and even temporary blindness (Zwart et al., 2016), which required astronauts to recover for months. **Microgravity** has been described as an inducer of **significant changes** in the **cardiovascular system** of astronauts both during and after flight (Otsuka et al., 2016). Changes in the nervous system, hearing and eyesight are also significant and related to the physiological adaptation/stress to microgravity (Cassady et al., 2016; Ertl et al., 2002; Strewe et al., 2012). The life-supporting environment of a Martian colony won’t facilitate astronaut recovery to a necessary healthy status, and is likely to require the most of astronauts’ physical capacities. Mars gravity is 0.38g (Lacquaniti et al., 2017), which indicates that astronauts will remain in hypogravity for the whole mission, or lifetime. Without the opportunity to return to an environment at 1 g (Earth gravity), we assume that most astronauts will **never recover** to a pre-journey healthy state, and may have to adapt to new parameters of health and well-being, as made possible in the Mars colony infrastructures. Moreover, astronauts will have to tolerate **lower oxygen tension** (Fogg 1995) and the risk of chronic exposure to **radiation**. NASA’s human habitats on Mars are being designed to prevent or mitigate most of the health hazards associated with long-duration missions, and are invested with new technologies for health monitoring and diagnostics, in association with exercise systems (NASA’s Journey to Mars – Pioneering Next Steps in Space Exploration, 2015). Other governmental and private enterprises have not detailed their efforts to maintain a healthy environment for astronauts, and have focused on the primordial aspect of transporting the first colonizers to Mars and providing a minimal environment compatible with human life. Overall, it is unknown how pregnancy would be influenced by microgravity symptoms, for better or worse.

The aspects of Martian life that could influence the process of reproduction are **many** (Urbaniak & Reid, 2016). For instance, it is not known if **reduced gravity** would affect the **production of reproductive cells** in both males or females, or the **success rate of fertilization** (Jones, Jennings, Pietryzk, Ciftcioglu, & Stepaniak, 2005). The effects of reduced gravity on the embryonic development and delivery are also unknown (Urbaniak & Reid, 2016). **Radiation** is known to be **deleterious** for adults and especially for **reproductive cells**, **developing embryos** and **fetuses**, and is already considered a **major health hazard** to astronauts (Northum, Guetersloh, Braby, & Ford, 2015; Shirazi-Fard, Alwood, Schreurs, Castillo, & Globus, 2015).

#### Microgravity

Javier Nombela & Sylvia Ekström, 21 (Sylvia Ekström is a doctor in astrophysics, specialising in stellar physics and she is responsible for communications at the Department of Astronomy at the University of Geneva, Javier G. Nombela is a graphic designer specialising in the visual representation of time, 4-7-2021, accessed on 12-20-2021, swissinfo.ch, "We will never live on Mars, or anywhere else besides Earth", https://www.swissinfo.ch/eng/we-will-never-live-on-mars--or-anywhere-else-besides-earth/46510576, HBisevac)

Can humans handle a trip to Mars?

The human body has been shaped by millions of years of **evolution** on Earth. It is therefore perfectly **adapted** to an environment subject to a **certain gravity and pressure value** and protected from **solar and galactic radiation** by the dual protection of the Earth's atmosphere and magnetosphere. If it leaves this environment, it is subjected to **great physiological stress**.

The first problem is **microgravity**, which has many consequences:

**Decalcification of bones**: astronauts lose bone mass 12 times faster than a post-menopausal woman;

**Loss of muscle mass**: life is too easy for our muscles in zero gravity and they melt away;

**Weakening of the heart**: with less effort to make, it becomes weaker and rounder;

**Fluids** (blood, lymphatic system) flow upwards to the **upper parts** of the body. Our entire vascular system is designed to fight gravity and pump upwards, which it continues to do even when gravity is gone;

**Risk of thrombosis**: as a result of the above two points, the blood circulates less quickly and can clot;

**Disturbance of the inner ear**: our balance organ functions thanks to the weight of small crystals on hair cells, and without gravity that is lost.

### SSA ADV---SC Bad---Deudney

#### Even trying spacecol causes extinction---locks-in dozens of new X-risks

Daniel Deudney, 20 (Daniel Deudney, is Associate Professor of Political Science, Johns Hopkins University, 2020, accessed on 12-18-2021, Oxford University Press, "Dark Skies: Space Expansionism, Planetary Geopolitics, and the Ends of Humanity" 362-62, https://oxford.universitypressscholarship.com/view/10.1093/oso/9780190903343.001.0001/oso-9780190903343, HBisevac)

This **dark scenario** of solar **space expansion** produced by the application of **geopolitical theory** has profound implications for the argument that colonization of other bodies in the solar system is necessary to **alleviate** or escape the **formidable catastrophic** and **existential risks** facing **Earth-bound humanity**. Both riskologists and space expansionists strongly believe, with Hawking, that “once we establish independent colonies, our entire future will be safe.”25 If all humanity’s eggs are in one fraying and vulnerable basket, then it stands to reason that spreading viable colonies of humans to other celestial bodies will help ensure the survival of the human species. While the role of existing space capabilities in amplifying the (p.357) dangers of the great technogenic threat of nuclear war belies the astro-optimism of space advocates, what of their cherished larger vision of making humanity a multiworld species? While space advocates propose a variety of ways space expansion might alleviate or escape existing risks, they give almost no attention to whether expansion might generate **new risks** or help **re-activate already regulated ones**. The list of major threats facing humanity is dauntingly long, and the expansionist agenda for solar space has many parts, making assessment a complex undertaking. But there are **six major ways** in which the realization of the space expansionist agenda for solar orbital space is likely to **generate** or activate **catastrophic and existential risks**. Taken in combination these arguments provide a strong basis for putting ambitious space expansion on the list of megathreats potentially confronting humanity, and for making every effort to relinquish it. Large-scale space expansion must be viewed as something akin to a full-scale **nuclear war** and assiduously avoided. Unlike many of the other threats humanity faces, addressing those created by ambitious space expansion is now extremely simple: **just say no**.

The realization of the space expansionist program for solar orbital space enlarges the probability and scope of catastrophic and existential risks confronting humanity in six ways: male!c geopolitics, natural threat ampli!cation, restraint reversal, hierarchy enablement, alien generation, and monster multiplication (see Table 10.3).

First, arge-scale solar space expansion will produce a radically novel political and material landscape that is extremely inauspicious for **security**, freedom, and **human survival**, a perfect storm of unfavorable possibilities and tendencies. With a new word for a new phenomenon, borrowed from astrology for a conjunction of negatives, solar space patterns can be characterized as geopolitically malefic. Just as the space environment creates terrestrially inconceivable extremes of frigid and torrid temperatures on opposite sides of the same object, so too the prospective solar landscape combines geopolitical extremes in ways unknown to terrestrial experience. Most ominously, solar space geopolitics combines the extreme diversities and high effective distances experienced on Archipelago Earth with system-wide levels of intense violence interdependence found on Planetary Earth. Polities will be extremely different and spatiotemporally remote but will be capable of readily inflicting **massive levels of destruction** on one another. Add shifting distribution, wide accessibility, and low distinctiveness, and the contours of the violence-material landscape becomes **even more prone** to **large-scale destruction**. With system-wide common government and mutual restraints very difficult to **create** and **sustain**, solar space comes close to being **maximally suboptimal for positive outcomes**, a nightmarish worst of all possible worlds in **geopolitical conjunction**. Extensive mutual restraints will be vitally necessary, but they will be nearly impossible to realize. While humanity’s (p.358) eggs might be scattered among many baskets, egg-smashing with large rocks will be easy—and likely.

Facing this extensive list of major factors disposing the system toward large-scale violent conflict in solar space will require humanity’s transmutation into Tsiolkovskian angels to avoid catastrophic and existentially threatening warfare. Perhaps the only saving grace of this key conclusion of geopolitical analysis is that the demons loosened by opening the Pandora’s box of space colonization might start to wreak their damage early enough to throttle the colonial enterprise before it gets too fatally under way.

A second way in which colonizing solar space poses catastrophic and existential threats is through **natural threat amplification**. Because **asteroids** and **comets** collide with the Earth, and the **total energy** contained within the population of near-Earth objects **vastly exceeds** that contained in all **nuclear arsenals**, they pose the inevitable prospect of **terrestrial calamities**. The rate at which these objects strike the Earth is now solely a function of natural forces. Space expansionists advance human movement into space to **avert** this threat and promote their (p.359) solution to this problem as a principal space contribution to **reducing** catastrophic and existential threats. But because the technologies to divert away from the Earth are essentially identical to those needed to direct objects toward the Earth, the rate at which these objects strike the Earth could **increase** if they become **instruments of interstate rivalry** and become **weaponized** as **planetoid bombs**. This prospect leads Sagan to recommend delaying the full mapping of asteroid orbits and development of diversion techniques until after some form of effective world government has been established on Earth. But with the spread of colonies across the solar system, the writ of any government on Earth will be severely limited. The same anarchical political configurations that Sagan views as incompatible with security from intentional asteroid bombardment on Earth will almost certainly be reproduced on a vastly larger, and more severe, scale in the Solar Archipelago. If, as seems extremely likely, systemic anarchy returns with the diaspora of humans across the solar system, then militarized rivalries are very likely to ensue, producing asteroidal weaponization. If this happens, a natural threat will have been amplified, enlarging the potential for the occurrence of a catastrophic event.

The third way in which ambitious space expansion could increase the catastrophic and existential risks confronting humanity is through **restraint reversal**. Barring civilizational collapse, the cornucopia of technological innovation will continue to **pour forth** its prodigies. If the monstrosities and menaces of the ever-widening technological cone of possibility can be thwarted only by staying within a narrow path of human preservation and enhancement, then space expansion must be assessed for its effects on the reversals, regulations, and relinquishments constituting the barriers of restraint. The record with nuclear weapons demonstrates that institutional architectures of restraint are not easy to erect and sustain on Earth. If space expansion makes the creation and preservation of restraints even more difficult, the probability of otherwise unrelated catastrophic and existential outcomes will rise, making it a potent **catalyst for multisided disaster**. Instead of mitigating the effects of multiple catastrophic and existential risks, large-scale space expansion promises to **multiply them**.

There are many reasons to anticipate that restraints established on Earth will be reversed if space colonization occurs. Restraints are **unlikely to survive** transplantation into diverse and demanding off-world environments. If humans are living on multiple worlds subject to different governments, regulation and relinquishment will be more difficult to establish, there will be more places for potential breakdowns, and verification of compliance will be **vastly more difficult**. If, as seems extremely likely, the many different worlds in the Solar Archipelago in systemic anarchy have violently hostile relations, establishing and sustaining restraints will become nearly impossible. Surveillance in the vast reaches of solar space will be vastly difficult. And if the human species radiates into multiple (p.360) species, the barriers to regulation and relinquishment will become even more formidable.

A particularly **dangerous case** of restraint reversal may be technologies leading to **a**rtificial super**i**ntelligence, a particularly potent technogenic threat. Space activities are already heavily dependent on advanced **computing** and robotic technologies, and peoples living in space are likely to be far more cyber-dependent than those on Earth. Living in harshly inhospitable environments, spacekind will have strong incentives to push the development of **cybernetic capabilities**. If a robust regime for the restraint and relinquishment of ASI is not established, human extinction might occur before significant space colonization occurs. If an effective ASI-restraint regime is developed on Earth before extensive space colonization takes place, it seems unlikely that such restraints would survive the expansion of humanity across the solar system.

It might be objected that the breakout of an ASI in some remote world in solar space would not pose a general existential threat to humanity once all of humanity’s eggs are no longer in one basket. If, however, we take seriously the standard scenarios of what an ASI would do once it emerges, the dispersion of humanity across multiple worlds would afford **no protection** whatsoever because an **uncontrolled A**S**I**, it is widely anticipated, will in short order expand not just on the planet of its origins but **across the solar system**, indeed the galaxy.[26](https://oxford-universitypressscholarship-com.offcampus.lib.washington.edu/view/10.1093/oso/9780190903343.001.0001/oso-9780190903343-chapter-10#oso-9780190903343-miscMatter-9-note-818) To the extent uncontrolled ASI is deemed something to avoid at all costs, large-scale space expansion must be viewed similarly.

Terrestrial arrangements to restrain **nuclear, genetic, and nanotech**nologies are also likely to be **reversed** as humanity expands to other worlds. The prospects of interworld and interspecies wars will provide large incentives for maintaining weaponized nuclear capabilities and for pursuing research into military genetic and nanotechnology applications. Any restraint regime for genetic technologies is unlikely to survive extensive human expansion into space, given the attractiveness of directed and **accelerated species alteration** in off-worlds. Solar space contains a vast number of islands for potential Doctors Moreau to work their alchemy, as memorably envisioned in Robinson’s 2312. If self-replicating nanomachines are possible and built on Earth, human existence will be threatened. But if a relinquishment regime is established on Earth, it is unlikely to survive in a solar diaspora. While interplanetary distances will afford a buffer from runaway replicators on other celestial bodies, this is unlikely to be permanently effective, thus delaying rather than foreclosing the gray-gooization of the Earth.

Fourth, **solar expansion** poses catastrophic and existential risks to humanity through **hierarchy enablement**. The emergence of totalitarian world government, nearly universally viewed as deeply undesirable, is reasonably judged a catastrophic threat to humanity. As we have seen, space expansion is likely to (p.361) produce hierarchies in several significant ways. Many space advocates view large-scale space expansion as freedom insurance and anticipate that various forms of freedom and plurality deemed in jeopardy on Earth can be recovered and preserved in space. But anticipations of a freedom dividend from space expansion are largely illusory because large-scale space expansion into Earth orbital space is very likely to enable the erection of a highly hierarchical world government, either from one-state military dominance of the entire planet or from the control of a major infrastructure for resources or energy. The further large-scale expansion of human activity into solar space is likely to facilitate the emergence of a highly hierarchical world government on Island Earth that could then be prone to become **totalitarian**.

The fifth way in which ambitious space expansion poses catastrophic and existential risks is through **alien generation**. The human species radiation anticipated by expansionists will generate significantly different forms of **intelligent life** suited to other worlds. If these anticipations are realized, there will be multiple intelligent species, all descendants from terrestrial Homo sapiens, in this solar system and eventually across the galaxy. While space expansionists celebrate this as an expansion of life, they rarely dwell on its implications for the future of human life. If ascentionist assumptions about moral improvement resulting from vertical expansion are true, humanity and its descendant species will live in harmony. But if ascentionist assumptions are unfounded, then the generation of alien intelligent species in this solar system should be viewed as a catastrophic and existential threat to humanity. As the cyber visionary Hans Moravec observes, “biological species almost never survive encounters with superior competitors.”[27](https://oxford-universitypressscholarship-com.offcampus.lib.washington.edu/view/10.1093/oso/9780190903343.001.0001/oso-9780190903343-chapter-10#oso-9780190903343-miscMatter-9-note-819) While habitat space expansionists embrace the Darwinian proposition that life inevitably expands, they do not seem to have thought through the implications of the corollary proposition that life forms often lethally compete.

The mechanisms for the annihilation of humans by advanced forms of extraterrestrial life, long a staple of dystopian SF, are easy enough to imagine. While it might be possible for humanity, mobilized and directed by a centralized world government devoted to planetary and species defense, to survive for a while, eventually the sheer number and variety of alien species with advanced technology is sure to prevail. Fictional accounts of alien threats to humanity are typically about life forms originating on other planets, and their eventual defeat commonly results from improbable expedients and heroics. The more realistic threat is probably from humanity’s descendants, and this threat can simply be prevented from arising by relinquishing space colonization.

The sixth way in which ambitious space expansion is related to catastrophic and existential risk is through **monster multiplication**. The number of “monsters,” threats that are unknown, has, we are told by riskologists, been steadily growing (p.362) with the development of powerful new technologies. Some monsters are in principle knowable, but others may be unknowable to humans. Ambitious space expansion will clearly entail the development of **powerful new tech**nologies, and the actors developing these technologies will be spread in multiple worlds across the solar system. Therefore it stands to reason that the number of monsters posing potential **terminal threats** will inevitably increase as ambitious space expansionist projects are realized.

Taken together, these six ways in which the realization of the space expansionist program for solar space pose catastrophic and existential threats demolish the core proposition of space advocates that large-scale expansion is desirable. Space expansionists start with the persuasive proposition that technological capabilities for destruction are rapidly enlarging, while the Earth remains spatially finite. They then reason that expanding the spatial range of human activities through expansion into outer space will dilute dangers and bring the ratios between the powers of destruction and the spatial domain of human activity into safer proportions. But they fail to recognize or acknowledge that the potency of the destructive potentials inherent in space expansion also increases, and these capabilities can potentially be brought to bear on the finite and fragile Earth and its human populations, thus making the survival problem, at least for the Earth and humanity, much greater. If humans, or their alien progeny, occupying this vaster spatial realm behave in the same manner as they have on Earth, all that will have changed is that the magnitude of the threats will have been enlarged. For large-scale space expansion, there is no plausible human path of preservation bypassing its many very likely menaces and monstrosities. For humanity in space, there is only darkness at the end of the tunnel.

### SSA ADV---SC Bad---Torres

#### Every second of delayed colonization outweighs

Phil Torres, 18 (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, 2018, accessed on 12-20-2021, Futures, "Space colonization and suﬀering risks: Reassessing the ‘maxipok rule’", https://www.sciencedirect.com/science/article/abs/pii/S0016328717304056, HBisevac)

Yet a closer look at what I have argued are the most **probable results** of colonizing the “last great frontier” suggests that doing so would yield a state of Hobbesian “warre” in which civilizations wallow in perpetual anxiety—**existential anxiety**—when they aren’t actively engaged in confrontations with their neighbors. The argument that I present thus invites a Gestalt switch: rather than peering up at the firmament and pondering how much of our cosmic endowment of negentropy is being lost that could realize some form of positive “value,” one should instead ponder how much **negentropy is being lost** that could realizean **s-risk**, or a condition marked by astronomical amounts of pain, misery, dread, fear, and suffering. In a phrase, **every second of delayed colonization should be seen as immensely desirable, and the longer the delay, the better**. This is not a conclusion that I find particularly appealing, yet I see no obvious flaws in the above arguments.

### SSA ADV---SC Bad---Disease

#### Colonizing causes microbes---extinction

Kiona Smith-Strickland 15 (Kiona Smith-Strickland is a freelance science and technology journalist, 6/22/15, accessed 1/1/21, “Why Scientists Have Been Scared of Space Germs for Almost 50 Years”, <https://gizmodo.com/why-scientists-have-been-scared-of-space-germs-for-almo-1712562498)AGabay>

So, what happens in the unlikely event that those measures fail, and the first crewed mission to Mars sets **alien microbes** loose on Earth? We don’t know, and that’s what makes containment so important. The whole thing could play out like a microscopic version of H.G. Wells’ War of the Worlds, where terrifying Martian invaders are killed off by Earth viruses. If extraterrestrial microbes escape from containment, they might not last long out in the world, where they have to compete with Earth’s own battalions of bacteria and viruses. Of course we might see the opposite scenario. Extraterrestrial microbes might thrive in Earth’s environment, and they might **out-compete** many Earth **microbes**, just like today’s terrestrial **invasive species** — which are problematic enough without help from other worlds. Humans would have no natural **immunity** to **Martian pathogens**, and our whole species might be **wiped** **out**. So you might think of extraterrestrial microbes as the potential next version of Ebola, which explains the Biohazard Level 4 recommendation. But humans aren’t the only ones in danger. Extraterrestrial microbes could rapidly **wipe out** Earth’s other **animal species**, **plants**, and **microbes**. That might actually be a more horrific scenario: humanity survives, but all the animals and plants we depend on for sustenance **die off**, or all the microbes that play such a vital role in our environment are displaced by alien microbes that don’t fill the same roles. There’s probably an excellent post-apocalyptic novel waiting to be built around that scenario.

#### Mars colonization causes infectious diseases AND turns the case.

Lackey ’18 (Katherine; Money NOW Editor @ USA Today; December 18; “Dangerous life on Mars? Humans could be infected and we could kill microbes on the Red Planet”; <https://www.usatoday.com/story/tech/science/2018/12/18/humans-could-kill-life-mars-could-infected/2216930002/>; accessed 7/27/19; MSCOTT)

Throughout history, every time humans have explored new places, one of the biggest issues we have faced is inf(e)ctious diseases – on both sides.

Not only did explorers bring pathogens to local populations whose immune systems couldn't fight off an unfamiliar disease, but those locals also harbored bacteria and viruses that infected the adventurers.

So what happens if there's life on Mars and humans travel there?

"Anytime there's a new introduction, on both sides, there's a lot of risks. We all can be harboring things that can create risk for the other side," said Pardis Sabeti, professor of immunology and infectious diseases at Harvard University. "There's all sorts of ways that when different life forms interact for the first time, all sorts of intentional and unintentional destruction can happen."

NASA has been sending rovers to Mars for decades, including InSight, which recently landed there, but the landers get throughly scrubbed before they're launched into space. And none of the vehicles have made a return trip to Earth.

With human travel to Mars on the horizon – NASA recently put the timetable at least 25 years – we must be prepared for the potential that a Martian microbe could harm us, said Sabeti, who speaks about that possibility on National Geographic's "MARS" series.

"There's not a high reason to think that there's an infectious disease there that can infect us and become problematic to us, but if it could, then it could rapidly become really problematic," she said.

But a bigger issue could be us: Human bodies contain trillions of bacteria, and those could infect the Red Planet instead, said Casey Dreier, chief advocate and senior pace policy adviser at The Planetary Society, a nonprofit organization that promotes space exploration.

"Every spacesuit is just leaking off viruses and bacteria that just are coming from the microbiome of the astronauts," Dreier said. "If we introduce microbes to Mars, would those inadvertently consume or wipe out or take over these potential habitable niches on the surface of Mars or in the subsurface of Mars, and actually destroy any life potentially hanging out on the Red Planet?"

#### Disease causes extinction

Diamandis 21 (Eleftherios P. Diamandis, Division Head of Clinical Biochemistry at Mount Sinai Hospital and Biochemist-in-Chief at the University Health Network and is Professor & Head, Clinical Biochemistry, Department of Laboratory Medicine and Pathobiology, University of Toronto, Ontario, Canada, April 14th 2021, “The Mother of All Battles: Viruses vs. Humans. Can Humans Avoid Extinction in 50-100 Years?” modified to fix author typo [“could result n” 🡪 “could result in” <https://www.preprints.org/manuscript/202104.0397/v1>) MULCH

The recent SARS-CoV-2 pandemic, which is causing COVID 19 disease, has taught us unexpected lessons about the dangers of human extinction through highly contagious and lethal diseases. As the COVID 19 pandemic is now being controlled by various isolation measures, therapeutics and vaccines, it became clear that our current lifestyle and societal functions may not be sustainable in the long term. We now have to start thinking and planning on how to face the next dangerous pandemic, not just overcoming the one that is upon us now. Is there any evidence that even worse pandemics could strike us in the near future and threaten the existence of the human race? The answer **is** unequivocally yes. It is not necessary to get infected by viruses of bats, pangolins and other exotic animals that live in remote forests in order to be in danger. Creditable scientific evidence indicates that the human gut microbiota harbor billions of viruses which are capable of affecting the function of vital human organs such as the immune system, lung, brain, liver, kidney, heart etc. It is possible that the development of pathogenic variants in the gut can lead to contagious viruses which can cause pandemics, leading to destruction of vital organs, causing death or various debilitating diseases such as blindness, respiratory, liver, heart and kidney failures. These diseases could result [in] the complete shutdown of our civilization and probably the extinction of human race. In this essay, I will first provide a few independent pieces of scientific facts and then combine this information to come up with some (but certainly not all) hypothetical scenarios that could cause human race misery, even extinction. I hope that these scary scenarios will trigger preventative measures that could reverse or delay the projected adverse outcomes.

#### Space is a breeding ground for adaptive and lethal microbes – space colonization increases the risk of disease spread.

Maynard, 20 (James Maynard, is the editor of 2 publications, Cosmic Companion and Alexandria Science, March 20 2020, “Disease in Space — What Will We Do?”, Medium, <https://medium.com/the-cosmic-companion/disease-in-space-what-will-we-do-830639acfffd>, accessed 7/17/2021) TK

Influenza and microbes like coronavirus could quickly work their way through a crew isolated together in the depths of space. “The absence of gravity precludes particles settling down, so they stay suspended in the air, and could be more easily transmitted. To prevent this, compartments are ventilated and the air HEPA filters would remove particles,” Jonathan Clark, a former six-time crew surgeon for NASA’s Space Shuttle program, stated. A 2012 study examining health records of 742 astronauts who flew on 106 flights revealed 29 cases of disease transmission, including fungal, urinary tract, and skin infections, as well as the flu. “For reasons scientists have not quite figured out, the immune system can go on the fritz in space: wounds heal more slowly; infection-fighting T-cells send signals less efficiently; bone marrow replenishes itself less effectively; killer cells — another key immune system player — fight less energetically. At the same time, the pathogens grow stronger, developing thicker cell walls, greater resistance to antimicrobial agents and a greater ability to form so-called biofilms that cling to surfaces,” Jeffrey Kluger reported in Time Magazine. Physical changes caused by radiation may present problems keeping astronauts and space colonists healthy. Another challenge for space travelers is that dormant viruses, like herpes simplex, can reawaken during space travel. Visitors have spent a year or more aboard the International Space Station. Colonists on the Moon or Mars would stay even longer, increasing health issues including sleep deprivation, even without an epidemic. Without proper sleep, and suffering from high stress levels, space travelers could be even more susceptible to infections their bodies may have fought off at home. “The types of problems you may encounter are a decline in mood, cognition, morale, or interpersonal interaction. You could also develop a sleep disorder because your circadian rhythm might be thrown off due to the 38 extra minutes each day on Mars, or by a small, noisy environment, or the stress of prolonged isolation and confinement,” NASA’s Human Research Program suggests.

Just as on Earth, isolation and containment of those potentially infected by a disease. The International Space Station is equipped with high-efficiency particulate air (HEPA) filters, and containment masks are available for infected residents of the ISS. Following any sort of infection, space travelers could be quarantined after returning to Earth, as they were in the early days of human space travel. Future colonies on the Moon or Mars will, almost certainly, have similar facilities for lessening the reach of outbreaks like the one currently engulfing our planet. Answers to the challenges of epidemics on Earth — much less on lunar or Martian colonies — remains unanswered. And, viruses are more likely to spread, and be harder to treat, in space than they are on Earth. But, many of the same treatments and procedures that we employ on Earth to limit the spread of disease and to flatten the curve of infections would also likely play significant roles in protecting colonists exploring the Solar System. As we expand out into the solar system, epidemics are bound to follow us. But, even today, we are already protecting the explorers who are pioneering our quest to reach beyond the confines of our planet.

### SSA ADV---SC Bad---Aliens

#### Going to space linearly increases risk of alien contact

DG 11 – Daily Galaxy, run by the Copernicus Complex and Cardiff University, Weekend Feature: 'Endeavour' Astronauts on Extraterrestrial Life -- "We'll find something out there."’, http://www.dailygalaxy.com/my\_weblog/2011/05/-weekend-feature-endeavour-astronauts-on-extraterrestrial-life-well-find-something-out-there.html

The human race will find life elsewhere in the Universe as it pushes ahead with space exploration, reported astronauts of the space shuttle Endeavour. The US space shuttle Endeavour prepares today to undock from the International Space Station and jet back to Earth, wrapping up its final journey before entering retirement, NASA said. "If we push back boundaries far enough, I'm sure eventually we'll find something out there," said Mike Foreman, a mission specialist on the Endeavour, "Maybe not as evolved as we are, but it's hard to believe that there is not life somewhere else in this great Universe," he added. “I personally believe that we are going to find something that we can't explain," said another astronaut, Gregory Johnson. "There is probably something out there but I've never seen it," he said. Dominic Gorie, the crew commander and veteran of four space flights, points out that explorers in past eras did not know what they would find before setting off across the ocean. "As we travel in the space, we don't know what we'll find. That's the beauty of what we do. I hope that someday we'll find what we don't understand." Takao Doi, a Japanese astronaut on past Endeavour missions, agreed "life like us must exist" elsewhere in the Universe. The comments come after a surprisingly high-level debate in Japan about UFOs. Japan's Foreign Minister, Nobutaka Machimura said in 2007 that he personally believed aliens existed, in an unusual rebuttal to a government statement that Japan had no knowledge of UFOs. Defence Minister Shigeru Ishiba went as far as to say that he was studying the legal ramifications of responding to an alien attack in light of Japan's post-World War II pacifist constitution. At the celebration marking the 50th anniversary of NASA, Stephen Hawking, Newton's heir as the Lucasian Professor of Mathematics at the University of Cambridge, answered the question, “Are we alone?” His answer is short and simple; probably not!

#### Extinction!

Brent Swancer 18, citing Stephen Hawking, one of the smartest people to ever live, "First Contact: Would Aliens Be Our Friends or Enemies?", Mysterious Universe, https://mysteriousuniverse.org/2018/11/first-contact-would-aliens-be-our-friends-or-enemies/

Of course, not everyone has a rosy view of alien contact, and there are just as many people, if not more, who firmly believe that extraterrestrial intelligences would almost certainly be malevolent towards us, and could even spell the end of life as we know it. The sinister rationale here is that one need only look at how we humans on earth have exploited resources and other peoples and wiped each other out. In this scenario, aliens would be nefarious, resource hungry, aggressive beings, and here to either enslave us or exterminate us for whatever reasons. If they are anything like us, then the idea is that we should be very worried about meeting them. One of the most well-known proponents of the idea that aliens will be hostile was legendary physicist Stephen Hawking, who famously once said: If aliens visit us, the outcome would be much as when Columbus landed in America, which didn’t turn out well for the Native Americans. We only have to look at ourselves to see how intelligent life might develop into something we wouldn’t want to meet.

### SSA ADV---SC Bad---Interstellar War

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

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

5 Conflict risks

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

Figure 5: Conflict risks of space colonization.

I identify two catastrophic and two existential conflict risks.

5.1 Secession and independence conflicts

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

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

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

5.2 Reactionary colonies

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

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

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

5.3 Inter-colonial conflict

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

The inevitable consequence of such a splintering of human civilization is that the different clusters of colonies would over time develop distinct cultures, and with only scarce and delayed contact with other clusters, a form of intergroup bias [40], the moral preference of one’s own in-group over the out-group, would likely start to manifest. Over time, that us-versus- them heuristic could help create distinct and solidified social identities within the colony clusters [41], and the beliefs and preferences about the outgroup colonies could become more overtly negative. Given enough time and great enough idiosyncratic development within each colony cluster, the cultural and moral connections between the colony clusters could further erode, and in their place, a sense of dread and looming danger about the others’ goals and preferences could take hold. Over a long enough period of time and great enough separation, the perception that other colonies are a threat could grow; so much so that taking preventative action and attacking and suppressing them might seem like the most rational course of action [42]. Given the scale and the likely technological sophistication of future weapons systems, a violent conflict between advanced colonies and colony clusters would create suffering on an astronomical scale.

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

#### That causes nanobots, pathogens, and asteroid terrorism---there all independent extinction scenarios that happen at lightspeed---means deterrence and rationality are impossible.

Torres ’18 (Phil; Project for Future Human Flourishing; *Space colonization and suﬀering risks: Reassessing the “maxipok rule”*; Futures 100 (2018) 74-85; MSCOTT)

One might surmise here that a balance of terror could establish bipolar stability, just as MAD did during the Cold War. Yet this appears implausible given the weapons mentioned above. For example, if one side could release self-replicating nanobots that disarm ~~cripple~~ the target civilization before it can retaliate, the result would be a terror imbalance that, under certain circumstances, would make a ﬁrst strike game theoretically rational. In fact, Kurzweil outlines a scenario in which ecophages destroy the entire biosphere of Earth within ∼90 min. This would involve a two-stage attack: ﬁrst, a small population of nanobots would spread around the globe, and second, at an “optimal” time this population would begin to self-replicate at an exponential pace. To put this in perspective, signal delays between Earth and Mars range from 4 to 24 min, depending on where each planet is in its orbit, and travel times range from 150 to 300 days. Add to this the inevitable lag of bureaucracies and the outcome is a serious credibility-of-deterrence problem. Even more, some future genius could invent a far more eﬀective way of weaponizing nanobots in the next 100 years, at which point humanity will probably have established martian colonies.19 Related scenarios involving designer pathogens that initiate “engineered global pandemics” or planetoid bombs capable of obliterating whole metropolises—or perhaps an entire ecumenopolis, if one ex- ists—could also be imagined, although I will leave this task for the reader.

But the situation is far worse than this, because ecophages, pathogens, and asteroids won’t pose the greatest risks to inter- planetary peace: heliobeams, DEWs, and gravity waves not only could inﬂict catastrophic damage on their targets but they could do this at or near lightspeed. In a ﬂash, one civilization could cripple the other’s key military and/or civilian infrastructure, thus rendering it unable to eﬀectively respond to an attack. Furthermore, since the speed of light imposes an upper bound on information transfer, there could be, in principle, no early-warning systems to alert the target civilization that an attack has commenced, which would severely compromise its ability to initiate defensive measures. One might here wonder: perhaps the attackee could overcome this defensive vulnerability by stationing counterstrike military drones throughout the solar system. They could be programmed to launch a coordinated attack if they fail to receive a “no-strike” signal that is ordinarily sent to them every few minutes. Thus, the destruction of key military infrastructure would result in the cessation of this signal and therefore the initiation of a counterstrike. But this too appears otiose since a ﬁrst strike using, say, DEWs could simply target these drones as well. The result is that threats of retaliation from each civilization would be literally in-credible and the balance of terror would collapse.

Here we should also not overlook the potential for accidents to cause conﬂicts when inter-civilizational tensions are suﬃciently high. The disturbing historical fact is that “pure dumb luck” played a critical role in preventing nuclear war from occurring during the Cold War. Individuals like Vasili Arkhipov and Stanislav Petrov more or less single-handedly averted nuclear holocausts, and an interpretation error in 1995 led Boris Yeltsin to become “the ﬁrst Russian president to ever have the ‘nuclear suitcase’ open in front of him” (Cirincione, 2013). Although intelligence is negatively correlated with accident proneness, and presumably our (post)human descendants will be cognitively enhanced to some extent, even a small probability of error could make disaster almost certain (see Torres, forthcoming). For example, imagine that a mere 500 people have access to a “button” that, if pushed, would initiate a catastrophic ﬁrst strike against the other civilization. If each of these individuals has a mere 0.01 chance per decade of accidentally pushing this button, the result is a staggering 99.3 percent probability that, within 10 years, the strike will occur. So, perhaps Earth and Mars—whose civilizations could potentially coexist for another 10 million centuries, until the sun burns out—won’t be quite as lucky as the US and Soviet Union were for the slightly more than four decades between 1947 and 1991.

The ﬁnal step in the present argument is to project this bi-planetary predicament into the vast reaches of outer space. Consider the billions and billions and billions of populations that could come to occupy a universe with 10 trillion galaxies and 1024 stars, each with its own traditions, boasting of weapons that could destroy entire galaxies or even the entire universe, and embedded in a cosmo-political system of lawless anarchy. There is no supreme governing system to provide security and no policies of deterrence to reliably prevent ﬁrst strikes. It is hard to imagine how such a predicament could avoid constant and catastrophic wars between civilizations both near and far. Indeed, theorists like Waltz (1979) have argued that multipolar state conﬁgurations are less stable and more prone to conﬂict than bipolar conﬁgurations. The reason is that uncertainty increases with the number of actors, and as uncertainty increases, so does distrust of everyone else’s intentions. Hence, the more civilizations there are in the universe, the greater the incentive for Tuckerian actors to preventively or preemptively strike their neighbors—or to induce a vacuum bubble in the hope that an “assembler” on the “other side” can enable some form of post-transition survival. The point is that the future will be marked by radical multipolarity, and this will greatly increase the probability of violence. Yet the diﬃculty of establishing Earth-independent colonies on Mars without catastrophic wars—as outlined above—suggests that our descendants might not make it beyond the solar system. In fact, Deudney (in press) argues that attempts to colonize space could constitute the Great Filter that explains why we see no evidence of intelligent aliens crying out for cosmic companionship in a universe slowly sinking into thermodynamic equilibrium.20

### SSA ADV---SC Bad---AT: Bostrom

#### Bostrom agrees stopping existing existential risks outweigh space colonization.

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

3.1 Neglecting existential risks

Space colonization is, as I argue in the introduction, a generalized strategy for the mitigation of existential risks: If we manage to establish permanent and sustainable habitats beyond Earth, there is a chance that existential risks would either become less probable or cease to be existential at all because not all proverbial eggs are in the same basket. Given this premise, it is tempting to extrapolate it into real-life policy: If space colonization is a hedge against existential risks, then achieving space colonization capabilities must be our top priority.

The problem with this prioritization strategy is that while it might, on its own, increase the probability of space colonization, it ignores the probabilities of existing existential risks. If we want to create as positive a future for humankind (in the sense of increasing humankind’s future moral expected value), then we need to weigh the benefits of achieving space colonization capabilities sooner rather than later against the benefits of reducing existential risks. When we compare the benefits of these two approaches, as Bostrom [2, 5] argues, it quickly becomes obvious that that the benefits of even marginally reducing existential risks over a given time period are probably much greater than the damage of delaying space colonization by that same time period.

### SSA ADV---SC Bad---AT: Extinction Inevitable

#### Extinction not inevitable---we can save Earth but only if we focus solely on it

Amitai Etzioni, 18, 8-25-2018, 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], AVD

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.

#### The risk of extinction isn’t high enough to justify settlement.

Szocik ’18 (Konrad; University of Information Technology and Management in Rzeszow, Department of Philosophy and Cognitive Science; October 3rd; *Should and could humans go to Mars? Yes, but not now and not in the near future*; Futures 105 (2019) 54-66; MSCOTT)

4.5. There is no risk on Earth suﬃcient to justify the expense of a space refuge

Space refuge is justiﬁed only when there is at least one kind of catastrophe on Earth which will lead to extinction of the entire human species. Baum (2015) and Baum et al. (2015) do not believe that space settlement oﬀers advantage over terrestrial refuge. If terrestrial refuge (aquatic and/or subterranean) is able to protect against the strongest catastrophes including asteroid impact, the unique serious rationale accepted by public opinion for space human mission fails. As Turchin and Green (2017) show, aquatic refuges based on adaptation of nuclear submarines may eﬀectively play their role. They may be surface independent, which is the basic criterion of any refuge (Baum et al., 2015). They are cheaper and easier in engineering terms when compared with Mars settlement.

A space refuge would not be able to cope with currently-occurring risks, e.g. overpopulation and climate change. Human overpopulation can be limited only on Earth by terrestrial policy and, if this can be done, no space base is necessary. If it is not possible, then no space base can solve this problem. For example, space settlement is not able to alleviate global warming, against Milligan’s suggestion. The unique way to do that on Earth is to reduce methane emission and/or to cool Earth by turning sunlight into space, as Solar Radiation Management proposes (Farquhar et al., 2017). There is only indirect, not direct applicability of space exploration. For instance, space technology might be applied to cope with asteroid impact or increasing the Sun temperature (Crawford). But these exogenous catastrophes caused by cosmic events are unlikely in lifespan of current and future generations (Tegmark & Bostrom, 2005, p. 754), and for this reason they oﬀer poor incentive for human space program. The unique rationale for space refuge mission could be future development of the Sun which will be getting more and more warmer in next billions years. But this threat does not justify human space settlement due to its high risk and high costliness (Jebari, 2015).

#### Extinction isnt inevitable as long as we don’t rely on unrealistic optimism and short term solutions

Jody Berger, 19 (Jody Berger is a writer for Stanford Earth magazine, citing Steve Luby, MD, an epidemiologist and the director of research for Stanford’s Center for Innovation in Global Health, 2-19-2019, accessed on 12-20-2021, Stanford Earth, "What's likely to cause human extinction – and how can we avoid it?", https://earth.stanford.edu/news/whats-likely-cause-human-extinction-and-how-can-we-avoid-it#gs.jxnd43, HBisevac)

As part of the center’s Planetary Health lecture series, Luby gave a talk titled, “**Can our collective efforts avert imminent human extinction?**”

In the end, Luby comes down firmly on the side of **yes**, we can. But along the way and **without intervention**, the future looks pretty **grim**. By 2100 – a short 81 years in the future – he sees three potential outcomes: **human extinction**, the collapse of civilization with limited survival, or a **thriving human society**. The first two outcomes could be the result of population growth coupled with the increasing destruction of our planet.

The growth in global population follows a flat line for most of human history and then, at the turn of the industrial revolution, the line shifts to nearly vertical – like a hockey stick – as the population explodes. The same shape show growth in technology and innovation –flat for thousands of years and then suddenly germ theory, telephones, airplanes and the internet, all within a few hundred years.

Sadly, a graph showing the **increasing destruction** of our environment would have the same shape and would lead to our **demise**.

“Without a thriving biosphere, there is no human future,” Luby said.

Also threatening that future? Our recently acquired abilities to destroy each other with **nuclear weapons** and **lethal synthetic biology**. As an example, CRISPR, a gene-editing technology, could be a force for good used to help eradicate disease or it could potentially be used to cause harm, such as by genetically modifying bird flu to become airborne. And, as Luby sees it, “There’s no shortage of sociopaths.”

Potential danger also lurks in the **acceleration of artificial intelligence**. AI doesn’t need to turn evil, just competent, to threaten a human future, Luby said. As an example, a machine that is indifferent to human survival could be programmed to create as many paperclips as possible. It may decide to transform the entire biomass into paperclips, he said.

To stick around and survive all these hazards, humans need to become more than competent at **looking past our own biases**, he said. **Short-term thinking, unrealistic optimism** and the **search for a panacea** — the Greek goddess of universal remedies — **won’t ensure a thriving future.**

### SSA ADV---SC Bad---AT: Asteroids

**No asteroids impact**

Mike Wall 16 (Mike Wall has been writing for Space.com since 2010. His book about the search for alien life, “Out There,” was published on Nov. 13, 2018. Before becoming a science writer, Michael worked as a herpetologist and wildlife biologist. He has a Ph.D. in evolutionary biology from the University of Sydney, Australia, a bachelor’s degree from the University of Arizona, and a graduate certificate in science writing from the University of California, Santa Cruz, 8/2/16, accessed 10/14/21, “Is Earth Safe from Asteroid Bennu?”, https://www.scientificamerican.com/article/is-earth-safe-from-asteroid-bennu/)AGabay

But, mission officials stressed, that chance is **slim**, and the **space rock** is not nearly **big enough** to pose an **existential threat** to the **planet**, despite what some media reports claimed over the weekend. [Potentially Dangerous Asteroids (Images)] "We're not talking about an **asteroid** that could **destroy the Earth**," OSIRIS-REx principal investigator Dante Lauretta, of the Lunar and Planetary Laboratory at the University of Arizona, told Space.com. "We're not anywhere near that kind of **energy** for an **impact**." SAMPLING AN ASTEROID If all goes according to plan, the $800 million OSIRIS-REx (Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer) mission will lift off atop a United Launch Alliance Atlas V rocket from Florida's Cape Canaveral Air Force Station on Sept. 8. The spacecraft will spend two years chasing Bennu down, finally rendezvousing with the near-Earth asteroid in August 2018. OSIRIS-REx will then study the space rock from orbit for another two years before grabbing at least 2.1 ounces (60 grams) of surface material in July 2020. In 2023, this relatively hefty sample should make it back to Earth, where researchers in laboratories around the globe will analyze the material in a number of ways. The mission team is chiefly interested in learning the role that asteroids like Bennu — dark, primitive and apparently carbon-rich objects — may have played in helping life get a foothold on Earth, Lauretta said. "Did these kinds of bodies deliver organic material and water, in the form of hydrated minerals like clays, to the surface of our planet that created the habitability and the environments that may have led to the origin of life?" Lauretta said. "That's the prime mission," to investigate that question, he added. There are secondary objectives as well, including learning more about the valuable resources that Bennu-like asteroids may harbor, Lauretta said. And then there's the planetary-defense angle, which has gotten a lot of attention in the last few days. A POTENTIALLY HAZARDOUS ASTEROID Bennu is officially classified as a potentially dangerous asteroid. In fact, there's an 0.037 percent (or 1-in-2,700) chance that it will **strike Earth** in the last quarter of the 22nd century, NASA scientists have calculated. Specifically, that's the probability that, during an Earthy flyby in 2135, Bennu will hit a special orbit-altering "keyhole" that will send it on a collision course with the planet later in the century. OSIRIS-REx will help scientists refine those odds, by refining their understanding of Bennu's orbit. (That orbit, by the way, is already the best-known of any asteroid, Lauretta said; thanks to extensive observations since Bennu's 1999 discovery, astronomers have nailed the space rock's orbital radius down to within 20 feet, or 6 m.) "Our uncertainties will shrink, so that will allow us to recalculate the **impact probability**," Lauretta said. "We don't know which direction it'll go. It could go down, because we just eliminated a bunch of possible keyholes that Bennu may hit. Or it may go up, because in the area that's left we have a higher concentration of keyholes compared to the overall area of the uncertainty plane." OSIRIS-REx's work will also help researchers better understand the Yarkovsky effect, which describes how absorbed sunlight, when radiated away as heat, affects an object's trajectory. Such information will improve knowledge not only of where Bennu is headed, but where it came from, Lauretta said. But to focus on where it's headed—what if Bennu does hit one of those keyholes in 2135, and the space rock squares Earth up for an impact in 2185 or thereabouts? What should humanity expect? Such an impact would likely devastate the local area but fall short of wiping out **civilization** or **causing a mass extinction**, experts have said. Astronomers estimate that a space rock must be at least 0.6 miles (1 kilometer) wide to cause a global catastrophe. (For perspective: The asteroid thought to have wiped out the dinosaurs—or at least to have finished them off—was probably about 6 miles, or 10 km, across.) But an impact would not be **inevitable**, even if Bennu had Earth in its sights. Given a decade or so worth of **lead time**, researchers say, an incoming asteroid could potentially be **nudged off course** using fly-along "**gravity tractor**" **probes** and/or "**kinetic impactors**." And if time is not on humanity's side, there's always the **nuclear option**.

#### Asteroids are more likely to hit Mars.

Szocik ’18 (Konrad; University of Information Technology and Management in Rzeszow, Department of Philosophy and Cognitive Science; October 3rd; *Should and could humans go to Mars? Yes, but not now and not in the near future*; Futures 105 (2019) 54-66; MSCOTT)

4.4. Humans cannot survive by space missions

The “species-survival” argument for space exploration fails when cosmic threats are considered. When the Sun gets too warm for life on Earth, neither Earth nor Mars will be safe. Mars and Earth are both exposed to Cosmic Ray Bursts emitted by neutron stars. Such emission could be responsible for mass extinction on Earth 570 mya (Dar, Laor, & Shaviv, 1998). Asteroid impact rather does not have potential to destroy immediately the entire life on Earth but such impact initiates long-term deleterious perturbations in atmosphere (Napier, 2006; 2015) including large scale biomass-burning (Wolbach et al., 2018). Greater risk is caused by centaurs moving in the solar system from the trans-Neptunian regions. Humanity should focus its attention on more distant regions of the solar system (Ćirković & Vukotić, 2016; Napier, Asher, Bailey, & Steel, 2015). Risk of asteroid impact is higher on Mars than on Earth. Unless humans are not able to travel beyond the solar system, the better anti-asteroid strategy is protection on Earth (Stoner, 2017, p. 340).

### SSA ADV---SC Bad---AT: Colonization Inevitable

#### Not inevitable---governments won’t do it because it’s not popular AND the private sector won’t do it because it’s not profitable.

Konrad Szocik, 20 (Konrad Szocik, University of Information Technology and Management in Rzeszow, Department of Philosophy and Cognitive Science, January 2019, accessed on 12-19-2021, Futures, " Should and Could Humans Go to Mars? Yes, but Not Now and Not in the near Future " pg. 54-66, https://www.sciencedirect.com/science/article/abs/pii/S001632871830199X, HBisevac) \*\*\*edited for ableist language\*\*\*

6. Public opinion Public opinion is, at least in the near future, the main sponsor of space research and space exploration. Bertrand, Pirtle, and Tomblin, (2017) show that the public is interested in human mission to Mars. The most preferred space mission is a crew in orbit and a robot mission on Mars surface. In other words, public criteria is low risk and low cost. The German space agency follows public opinion and social interest because is focused on duty for society and oriented to social purposes as “climate change, mobility, communication and security” (Zypries, 2017). Politicians are prone to **reduce** **space budgets** or to not invest in long-term human settlement missions due to public opinion. Consequently, progress in space technology is still ~~retarded~~ [slow]. State of art in space transport means did not change qualitatively since the Space Race between the US and the Soviet Union. Impact of public opinion may differ in various countries. Max Grimard (2012), p. 6) shows how important is space program for public opinion in the US. Public sympathy for American presence in space is counterbalanced by the unpredictability of politician authorities, the tensions between presidents and the Congress (Grimard, 2012, p. 12), and the important role played by competition with Russia and China (Grimard, 2012, p. 6). Grimard adds that Russia is similar case but it is currently entire focused on stability of space programs, including renovation of old infrastructure than on new space exploration programs. According to Grimard (2012), p. 13), this fact excludes Russia from being the leader of international collaboration in space policy despite its historical advantages. China, according to Grimard, repeats space policies of the US and Soviet Union. By contrast, in Japan and Europe, prestige does not play role. Japan and Europe are focused on scientific and technological contexts. Space program is not a part of national policy. Due to its costs, politicians may decide to not risk negative approach of public opinion. But public opinion does not threaten private investors which can consider space as object of their investment. 7. Commercial exploration of space is not a workable alternative Risk of funding the wall might be avoided by commercial exploration of space (Crawford, 2016). According to Crawford, some space projects such as next generation of large telescopes or crewed mission to Mars are non-profitable. While they are a governmental duty, they could be funded partially by profits from commercial exploration of space (for instance, space mining). Hope for private exploration sounds reasonable but is counterbalanced by commercial focus on profits. Because mission to Mars has only scientific profits, only public sponsors will be invested in this project. James S. J. Schwartz (2014) adds that two of the possible reasons for human space mission, such as improving human welfare and progress in scientific exploration, are well beyond interests of private companies. Newman and Williamson (2018) quite similarly expect that private space exploration will be focused on financial profits more than on environmental sustainability. Private investors are not obliged to act altruistically and to sacrifice their business for uncertain idea. W. Henry Lambright (2017) adds that private companies at least at first stages of Mars space program will not be able to fund it. For this reason, Mars space program requires multi-generational effort and political stabilization. The challenge of safety works against private investors in space program. Public space agencies have achieved high standards of safety. They behave in careful and conservative ways. Commercial, private projects do not have the same advanced technology, the large number of scientists and support staff, and the generous budgets. Catastrophe would likely break a private space program. The lack of experience of private companies in space exploration is partially responsible for higher risk of technological failures even in relatively easy tasks as crash of Momo-2 rocket launched by Japanese start-up on 30 June 2018 several seconds after launch. This does not mean that private investors are not able to explore space, but they are able to do that only when they receive profits. In scenario of commercial exploration of space, we should wait for some point in the future when a human space base appears as byproduct of commercial activity. A human base on Mars might be a by-product of hotels on LEO or space mining. Some investors who want to build space hotels may try to settle space regions beyond LEO and build hotels on the Moon and/or Mars. From touristic point of view, staying in the Moon or Mars hotel may be more attractive than on LEO. Investors working in asteroid mining may extend their business to the Moon and/or Mars. Both enterprises even if focused on purely commercial purposes, will not be easy (perhaps impossible) to achieve by private companies alone. Elvis (2012), p. 549) argues that asteroid mining will be challenging due to, among others, difficulties in detection of appropriate asteroids. He shows that among about 1200 analyzed meteorites only 13 of them contain high level of platinum profitable for their exploitation. Elvis suggests that NASA should reorient its strategy from focus on exploration to support for commercial utilization of space. Exploration will appear as a consequence of commercial profitable activity (Elvis, 2012, p. 549). Estimated profits of asteroid mining10 are counterbalanced by high costs of exploitation and possible decreasing of price of currently rare resources (Genta, 2014).11

### SSA ADV---SC Bad---AT: Reduces X-Risks

#### 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.

### Solvency---NATO Cyber Turn

#### TAG.

Jeppe Jacobsen, 21 (Jeppe Jacobsen is a Ph.D. candidate at the Danish Institute for International Studies and the Center for War Studies at the University of Southern Denmark, 2021, accessed on 7-4-2022, International Affairs, “Cyber offense in NATO: challenges and opportunities”, <https://academic.oup.com/ia/article-abstract/97/3/703/6205395>, HBisevac)

In its 2018 ‘vision’, the US Cyber Command built implicitly on the dominant intelligence norm. Here, the objective is to become more agile and act as close to the adversary as possible (‘defend forward’).70 The United States considers ‘constant contact’ and ‘persistent engagement’ as the necessary guiding principles to achieve superiority in cyberspace and to take full advantage of the broader potential for pursuing its political objectives through cyberspace. During the 2018 US midterm elections, for example, the US Cyber Command worked closely with the NSA to disrupt servers operated by the Russian Internet Research Agency aiming to spread fake news and stir up tension in the United States.71 More recently, the US Cyber Command responded with various cyber effects against Iran after the Iranian Revolutionary Guards apparently placed mines on ships in the Strait of Hormuz.72 These practices illustrate that, for the United States, cyber effects provide political options when one does not want to escalate existing tensions into military confrontation. Defensive coordination between allies through CYOC supports such defensive use of cyber effects, increasing the possibility that US Cyber Command will be allowed to ‘defend forward’ and work persistently through allied networks.73 A more **cyber-active NATO**, however, risks being **counterproductive** to the ambition to ‘**defend** **forward**’ through allied networks

Unintended **conflict escalation** from ongoing cyber activity is mainly a risk if military analysts—in a strategic environment with heightened attention to military confrontation—**ignore** the **dominant intelligence norm**. If that happens, it becomes more likely that ‘persistent engagement’ and active cyber defence will be misinterpreted as **military** **prep**aration, **armament** or the initial phase of an **attack**. If NATO, an organization that has publicly returned to its original raison d’être of deterrence and collective defence, becomes the entity that coordinates cyber effects below the threshold of armed conflict, then the **likelihood increases** that Russia **misinterprets** these effects as **escalatory** and **acts accordingly**. In other words, a more active NATO in the current strategic environment increases the risk that the existing intelligence norm will be **undermined** and **replaced** by a more **militarized norm**.

### Misc---Turkey-Russia Space Collab

#### Turkey is collaborating with Russia now on space tech to piss off NATO.

AT, 2-4 (Aerospace Technology, 2-4-2022, accessed on 7-7-2022, “Regional rivalries and Nato tensions – defining Turkey’s military space ambitions”, <https://www.aerospace-technology.com/comment/regional-rivalries-nato-tensions-turkey/>, HBisevac)

Over the past decade, Turkey has launched its defense industry into the space domain, in an attempt to match the **fast-developing capabilities** of its regional and global counterparts. The oft used term ‘space race’ does not represent global industrial activities in the domain, but it does hint at the growing pressure for countries who previously were not involved in extra-terrestrial activities to catch up and participate. Turkey’s goals include a plan for a hard landing of a domestically produced rocket on the moon by 2023, with a soft landing and rover launch by 2028, the construction of a Turkish space port, and plans to send a Turkish citizen to the ISS.

Madeline Wild, Associate Defense Analyst, comments: “Turkey’s ambitious aim to have launched a rocket that can reach the moon by 2023 reflects the overall nature of its space program. Rather than purely being necessitated by the desire for sovereign use and control of satellites, it revolves around the **power** and **political superiority** that **headline grabbing achievements** (such as reaching the moon) can bring. The introduction of Turkey’s space program in 2021 came shortly after Turkey’s longtime rival the UAE, announced that its space probe had entered Mars’ orbit. President Erdogan’s speech in February 2021, launched the Turkish space program and reinforced the geopolitical importance of the space program, much of which was rhetorically charged with ideas of domain leadership and the ‘space race’.

“Last year NATO made space the fifth domain to be covered by the collective security principles set out in the organizations charter. Subsequently it is unsurprising that members such as Turkey are boosting their space programs, in order to fulfil their commitments in the event of any potential incident in this domain. This will have been noted by TUA, the Turkish Space Agency, but it will **not** be the desire to uphold NATO’s **collective security principle** driving Turkish space development. Instead, Turkey’s fractious relationship with certain NATO members will fuel **the desire** to become a **regional leader** in the domain.”

Wild continues: “In the Strategic Plan 2019-2023, Turkey set out its aims to produce and procure 75% of all goods domestically by 2023. In order to do so whilst still meeting its space related targets, Turkey’s aerospace industry will have to rapidly upskill. Whilst Turkey will benefit from the fact that its domestic industry (namely state-owned company Rokestan) has already launched a sounding rocket, much of the current space activities are reliant on international cooperation. For example, US-based SpaceX is currently responsible for the launch of Turkish satellites, Türksat 5A being the most recent of these. Elon Musk and President Erdogan have had direct communication to discuss future cooperation and collaboration.”

“Turkey is also collaborating with **Russia** on **space-based tech**nology, a move which could **heighten** already **tense relationships** between **NATO** and the Black Sea state. Russia will help Turkey construct two launch platforms, one on land and one on sea. This forms part of a **wider package** of **defense cooperation** between the states, after the US **denied** the sale of the **F-35** to Turkey, pushing President Erdogan further into the President Putin’s sphere of influence.”

### Counterplans---DoS---1NC

#### The Department of State should:

#### ---increase its engagement over cybersecurity and outer space assets with the North Atlantic Treaty Organization;

#### ---establish a memorandum of understanding with China and Russia over space activities and proximity operations.

#### Solves the AFF.

Aaron Bateman, 21 (Aaron Bateman is a Ph.D. student in the history of science and technology at Johns Hopkins University and previously served as a U.S. Air Force intelligence officer, 3-4-2021, accessed on 7-8-2022, War on the Rocks, “RESTRAINT, NOT SUPERIORITY, IN SPACE”, <https://warontherocks.com/2021/03/restraint-not-superiority-in-space/>, HBisevac)

There is a conflict at present between the military’s desire for **space superiority** and the need for **strategic restraint**, and the **latter** is in the **national interest**. The Joe Biden administration should develop a strategy that more clearly **emphasizes diplomacy** to promote space security. To this end, Washington ought to take concrete steps toward securing a moratorium on debris-producing anti-satellite testing and advocating transparency for proximity operations in orbit. The United States should signal to Russia and China that it truly seeks solutions to space security problems, rather than only portraying Moscow and Beijing as destabilizing space actors. At the same time, the Department of Defense and the intelligence community need to invest more in capabilities that will increase the resiliency of national security space systems.

An examination of Cold War American and Soviet space activities reveals that **restraint**, even when faced with increasingly sophisticated space threats, promoted **security** and **stability**. Deviation from this policy in the 1980s became a source of **substantial tension** between the superpowers in the final decade of the Cold War. The lessons of this period, therefore, are important for considering how the United States should approach space security as the number of actors and threats continues to expand.

U.S. Space Strategy from the Cold War to the Present

U.S. government claims that only recently has space become contested, and that Beijing and Moscow are the main drivers behind space insecurity, overlook the realities of the Cold War and its legacy. Policy analysts oftentimes argue that the United States was pursuing a policy of space as a sanctuary through the early 1970s. The word “sanctuary” was not, however, officially used until the mid-1970s, and this term can obscure the nuances of U.S. views on space security. According to noted space historian Walter McDougall, American space policy emphasized its peaceful “rather than explicitly non-military’ purposes.”

An overriding concern of the Dwight Eisenhower administration was establishing the principle of freedom of space (i.e., having ability to overfly foreign territory from space without it being considered a violation of sovereignty). Promoting this concept was especially critical because the U.S. government needed reconnaissance satellites to peer behind the Iron Curtain to gather intelligence on the Soviet Union. With the first successful launch of a U.S. photographic reconnaissance satellite in August 1960, the majority of what U.S. intelligence knew about Soviet and Chinese ground military forces was “attributable to satellite intelligence.” Consequently, peace in space was essential for the viability of space reconnaissance.

Despite the emphasis on peaceful intent, the U.S. military did conduct the world’s first anti-satellite test in 1959, in addition to high-altitude nuclear detonations that reached into space. Space historian Asif Siddiqi has shown that early U.S. anti-satellite activities served as the “first major catalyst for the Soviet anti-satellite program.” The John F. Kennedy administration furthermore approved a very limited nuclear anti-satellite capability called Program 437 that was designed to defend against a Soviet nuclear orbital bombardment system. At this point, American anti-satellite weapons were believed to be a necessary hedge against the perceived Soviet orbital nuclear threat, and U.S. officials de-emphasized anti-satellites in U.S. public diplomacy on space. By the early 1970s, Program 437 was placed in a limited operating status. More expansive U.S. military anti-satellite proposals, like Project Spike (a non-nuclear air-launched anti-satellite concept), were also denied. Space security expert Clay Moltz has argued that “military-space restraint became institutionalized during the 1962-1975 period.”

It became clear in the early 1970s that the Soviet Union’s anti-satellite weapon was increasingly sophisticated. The consensus among U.S. officials was that a new U.S. anti-satellite would not, however, have a deterrent effect or enhance the survivability of American satellites. Strategic restraint was still the overriding objective. This situation changed in the Gerald Ford administration. With détente crumbing and tensions on the rise between Washington and Moscow, Ford endorsed the idea that “treating space as a sanctuary, [was] neither enforceable nor verifiable.” As a result of this, he approved a new anti-satellite program, not to respond to the Soviet Union’s anti-satellite, but rather to be able to destroy Soviet satellites used to support tactical military operations.

The Jimmy Carter administration was convinced that arms control overrode the military arguments in favor of a new anti-satellite. Furthermore, Carter himself believed that restraint was necessary but only possible if the Soviet government agreed to constrain its own anti-satellite program. The president wanted to secure a comprehensive ban on anti-satellites and he used the U.S. anti-satellite effort to place greater pressure on the Kremlin. There were nevertheless significant concerns about being able to verify an anti-satellite ban, but Carter maintained that important steps, like a “hostile acts” agreement and anti-satellite testing moratorium, could reduce tensions. These talks fell apart, however, after the Soviet invasion of Afghanistan in 1979.

President Ronald Reagan believed that strategic restraint in space hampered U.S. national security interests. He endorsed using anti-satellites for space control, (i.e., having the ability to deny adversaries the use of space). Reagan also created U.S. Space Command, which was eliminated in 2002 and then revived in 2019. He even considered a separate military service for space. Most significantly, his Strategic Defense Initiative — a program for a missile defense system with land, sea, air, and space components — called for the permanent deployment of weapons in space. Because a ban on anti-satellites would have limited the development of the Strategic Defense Initiative, the Reagan White House eschewed space weapons arms control with the Soviet Union. In 1985, the United States destroyed, moreover, an American satellite in space using its miniature homing vehicle anti-satellite system.

Much like President Donald Trump’s space ideas, Reagan’s were met with skepticism by many senior officials in the national security establishment. Even though Reagan’s military space agenda did not come to fruition, it signaled that U.S. strategic restraint in space was not necessarily a permanent state of affairs. As a consequence, Russia began developing systems like its Avangard hypersonic missile in response to the Strategic Defense Initiative.

By the end of the Cold War, there was a growing group of space zealots who advocated the expanded use of spacepower to achieve military goals. These space advocates wanted to use space systems for power projection, deterrence, and offensive action, rather than just military support. The collapse of the Soviet Union, however, largely re-instated a U.S. emphasis on restraint in space. The United States did continue research into anti-satellites and missile defense, but both were significantly scaled down. Additionally, by 1990, the United States began to officially recognize that debris-producing anti-satellite tests were highly problematic.

The post-Cold War lull in space security concerns did not last long. After the 2007 Chinese anti-satellite test that produced significant debris, the United States shot down one of its own satellites using a Standard Missile-3. Even though this was not a dedicated anti-satellite capability, Washington demonstrated once again that it had the means to execute offensive action against satellites. The Chinese test in particular contributed to the establishment of President Barack Obama’s policy that identified space as increasingly congested, contested, and competitive. Since that time, U.S. concerns about space have only grown. Despite the increased anxiety about space security since 2007 in particular, the United States has still, on the whole, exercised restraint in its pursuit of anti-satellite weapons capabilities and has primarily focused on non-kinetic electronic warfare systems.

The creation of the U.S. Space Force, while officially a response to adversary behavior in orbit, has not adequately furthered U.S. and allied interests in space. On the positive side, the new service has placed greater attention on the importance of space systems and the requirement to address their vulnerabilities, in addition to the need to streamline U.S. defense space acquisition. It has also, however, created a lobby for the pursuit of **military space superiority**, which is poorly defined, not easily measurable, and **destabilizing**.

Toward a New U.S. Strategy for Space Security

At present, security challenges in space are only becoming more complex, but U.S. space strategy is not postured to promote security and stability. The Biden administration should **restrain** U.S. military goals that emphasize **offensive action** and **superiority**. The space lessons of the Cold War suggest that a continued emphasis on space superiority will only lead to a more **intense** **military-space competition** with Moscow and Beijing. The U.S. objective should be the promotion of strategic stability primarily through diplomatic engagement. The Department of Defense should focus on measures to increase the resiliency of U.S. space systems and thereby reduce vulnerabilities. As Heather Venable has argued, the Space Force in particular should focus on traditional missions (i.e., space support functions) rather than “futuristic views of spacepower employment.”

In the immediate term, the United States should change the way it talks about space security. Senior leaders ought to stop making ahistorical statements like “over the past five years, space has become contested.” These factually incorrect declarations, which are repeated time and time again, make Space Force leadership look out of touch with reality. Additionally, accusing Beijing and Moscow of having “weaponized space” ignores how U.S. actions have contributed to space insecurity. Strategic messaging needs to emphasize U.S. intent to promote security and stability in space rather than military space superiority, which would be especially difficult to achieve given the threat environment and might be impossible to measure. Most importantly, there needs to be greater attention on establishing norms of behavior that promote security in the space domain through diplomatic engagement. Consequently, the State Department ought to play a much more prominent role in promoting U.S. national security space interests, both in terms of messaging and foreign engagement to secure a more stable situation in space.

In 2020, the Pentagon released its Defense Space Strategy. This document identifies space as a “distinct warfighting domain” along with the need to maintain “superiority” in space. It falls short in several key areas. It does not, for instance, effectively explain how the United States is going to deter adversary activity in space or how it is going to be capable of “winning wars that extend into outer space.” In 2019, when he was still chief of staff of the Air Force, Gen. David Goldfein talked about the need to be able to “hit back [in space].” Similar references to offensive action have been made by other officials without any specific details regarding capabilities.

It is very well possible that senior military leaders believe that these statements about potential offensive action enhance space deterrence. This idea is not, however, compelling, at least in part due to the asymmetry in dependence on space between the United States and its adversaries. In 1972, Amrom Katz, a RAND Corporation analyst who was an expert on strategic reconnaissance, argued that a U.S. anti-satellite would not have a deterrent effect, which was a view shared by Brent Scowcroft, Ford’s national security advisor. Scowcroft believed that, since the United States was still considerably more dependent than the Soviet government on space, an anti-satellite weapon would not have deterrent value. Thinking only in terms of space deterrence is too limited anyway. British space security expert Bleddyn Bowen warns against the danger of “adhering too narrowly to the concept of ‘space deterrence’ [which] can mislead analysis to isolate space from Earth.” Any space deterrent proposals, therefore, should be placed within a larger deterrence framework.

Many U.S. diplomats agreed during the Cold War that even rhetoric about offensive strikes in space could be destabilizing. Similarly, a 2010 RAND study stated that

a national space policy more conducive to deterring attacks on U.S. space systems would avoid provocative rhetoric about denying others the use of space and would, instead, explicitly condemn any use of force to, from, or in that domain, except in retribution for attacks on one’s own space systems.

Consequently, bellicose language about military action in space should be excised from official U.S. government pronouncements on space policy.

The Defense Space Strategy does identify the need to promote “favorable standards and norms of behavior in space.” This statement, however, raises the following question: favorable standards according to whom? In February, Maj. Gen. DeAnna Burt, the commander of U.S. Space Command’s combined force space component, announced that the United States is going to take a more direct role in establishing norms of behavior in space. Secretary of State Antony Blinken has also said that the United States will focus “on developing standards and norms of responsible behavior in outer space.” The ability of the Department and Defense, the State Department, and the intelligence community to arrive at a consensus on the details of norms development will, however, be a substantial challenge. Despite the policy obstacles, it is in the U.S. interest to take a leading role in working with international partners to define norms of behavior in two especially important areas: rendezvous and proximity operations, and debris generation. Defining limits and constraints for both can significantly promote greater stability among spacefaring nations.

Rendezvous and proximity operations involve one satellite getting close to another for a wide variety of benign or potentially hostile reasons. For example, satellites are being developed to service and repair malfunctioning space systems. Additionally, the same techniques for benign proximity operations can be used to carry out observation of other countries’ satellites or to attack them. According to space security expert Brian Weeden, “any time you have militaries operating near each other without a lot of transparency or clarity [there is] the opportunity for misperceptions that could lead to something very bad.”

The U.S. government should determine, internally, what it should or should not allow with regard to **proximity operations** (i.e., how close is too close). Subsequently, the State Department should determine if the **identified limits** would be acceptable to other spacefaring nations, especially China and Russia. There is going to be **resistance** to defining constraints, out of fear that it could box in future U.S. military freedom of action, but the threat of not doing so is **even greater** because a mishap involving two military spacecraft of different nationalities could lead to a crisis. **Even if** Beijing and Moscow **resist defining limits**, then the United States can use its own proposed boundaries to place **diplomatic pressure** on both countries to **cooperate** in developing an acceptable framework.

Even more pressing than proximity operations is the problem of debris generation. The 2007 Chinese and the 2019 Indian anti-satellite tests demonstrated that testing kinetic weapons against objects in space can create significant hazards. It is imperative therefore that the United States leads the way in banning kinetic weapons tests against space objects. The United States should, however, differentiate more clearly between debris and non-debris producing tests. Comments by the U.S. government on Russia’s most recent anti-satellite tests highlight them as destabilizing, but it should be noted that Moscow has not executed a debris-producing anti-satellite test since the Cold War. Not making this distinction only adds to current tensions in Washington’s relationship with Moscow. The primary focus needs to be on preventing tests that produce debris. Placing restrictions on non-debris generating tests would be especially difficult because there are too many dual-use systems that are regularly tested (e.g., ground-based and sea-deployed missile defense).

A common argument against arms control on kinetic anti-satellites is that it won’t be possible to verify. This is due to the fact that it is relatively easy to hide offensive weapons on satellites and because so many space systems are dual-use. A moratorium on anti-satellite testing can, however, be verified. Debris cannot be hidden — any test against an object in space resulting in debris would be immediately detectable. In light of this, the Biden administration should make a moratorium on testing that generates debris in space a high-priority arms control objective.

Diplomatic engagement is not the only solution to promoting greater security in space. Resiliency of space systems and their supporting architecture needs to be a high priority for the Department of Defense and the intelligence community. This is both a technological and a diplomatic task. Amrom Katz said over 30 years ago that the United States was investing in satellites that were highly sophisticated, but very few in number, and that had become a “juicy target” in space. The U.S. government needs to continue to invest in more space systems that are hardened for dealing with both physical and non-kinetic threats. Anti-satellite countermeasures could involve protecting optical sensors from directed energy weapons, employing decoys, and increasing satellite maneuverability (among others). The United States can also invest in proliferated low earth orbit constellations. This involves putting up more satellites, which creates more targets and, therefore, increases survivability. Additionally, more fully integrating allies into the U.S. space architecture would be an important step toward ensuring the resiliency of national security space systems that any American-led coalition will need.

Finally, the United States needs to more thoroughly explore rapid reconstitution capabilities (i.e., having the ability to launch new systems quickly). This would also involve looking at alternative launch facilities. The United States primarily relies on Vandenberg in California and Cape Canaveral in Florida for launches, but, in the 1980s, for example, the Strategic Defense Initiative Organization examined using submarines to launch satellites under the name Project Janus. Examining new ways to be able to ensure access to space if Vandenberg or Cape Canaveral become unusable due to a natural or man-made catastrophe is essential. As more allies develop spaceports, they too can provide support for launch resiliency.

Looking Ahead

The Space Force will likely remain intact with the Biden administration. Certainly, space security challenges are only going to become more acute as countries expand their civil and military activities in orbit. Consequently, the Biden team should make substantial modifications to the U.S. approach to space security. Its overarching space framework should emphasize **diplomacy** to achieve a more **stable** situation. Rather than just highlighting what the U.S. government sees as destabilizing Russian and Chinese space actions, the United States needs to take the initiative in developing norms of behavior that can lead to a more secure space environment for all nations. This different approach to space will require a **less militarized agenda** that gives a much more **prominent role** to the **State Department** in developing and implementing U.S. national security space strategy. It will also require a return to emphasizing space support rather than offensive action.

While space systems have been enabling combat effects for several decades, there has never been a war that has extended into outer space. It would be derelict on the part of the Pentagon not to prepare for space warfare, but it should not be treated as an inevitability. The U.S. government should, therefore, continue to pursue a more resilient space architecture, while emphasizing diplomatic solutions to space security problems. Additionally, the way in which U.S. space priorities are communicated is especially important. Words matter and can have strategic consequences. Messaging can promote deterrence, order, and stability, or it can lead to chaos and crises. The pursuit of stability through **diplomacy**, rather than **military superiority**, should be at the **heart** of U.S. national security space strategy to better ensure that space continues to be a conflict-free environment.