# 1NC vs Sage MP

## OFF

### 1NC - OFF

T-Outer Space

#### Interpretation: Topical affirmatives must defend the appropriation of outer space

#### Outer space starts 372 miles above the surface of earth.

National Geographic No Date [National Geographic Society, "Atmosphere," <https://www.nationalgeographic.org/encyclopedia/atmosphere/>] Sachin

Earth’s atmosphere stretches from the surface of the planet up to as far as 10,000 kilometers (6,214 miles) above. After that, the atmosphere blends into space. Not all scientists agree where the actual upper boundary of the atmosphere is, but they can agree that the bulk of the atmosphere is located close to Earth’s surface—up to a distance of around eight to 15 kilometers (five to nine miles). While oxygen is necessary for most life on Earth, the majority of Earth’s atmosphere is not oxygen. Earth’s atmosphere is composed of about 78 percent nitrogen, 21 percent oxygen, 0.9 percent argon, and 0.1 percent other gases. Trace amounts of carbon dioxide, methane, water vapor, and neon are some of the other gases that make up the remaining 0.1 percent. The atmosphere is divided into five different layers, based on temperature. The layer closest to Earth’s surface is the troposphere, reaching from about seven and 15 kilometers (five to 10 miles) from the surface. The troposphere is thickest at the equator, and much thinner at the North and South Poles. The majority of the mass of the entire atmosphere is contained in the troposphere—between approximately 75 and 80 percent. Most of the water vapor in the atmosphere, along with dust and ash particles, are found in the troposphere—explaining why most of Earth’s clouds are located in this layer. Temperatures in the troposphere decrease with altitude. The stratosphere is the next layer up from Earth’s surface. It reaches from the top of the troposphere, which is called the tropopause, to an altitude of approximately 50 kilometers (30 miles). Temperatures in the stratosphere increase with altitude. A high concentration of ozone, a molecule composed of three atoms of oxygen, makes up the ozone layer of the stratosphere. This ozone absorbs some of the incoming solar radiation, shielding life on Earth from potentially harmful ultraviolet (UV) light, and is responsible for the temperature increase in altitude. The top of the stratosphere is called the stratopause. Above that is the mesosphere, which reaches as far as about 85 kilometers (53 miles) above Earth’s surface. Temperatures decrease in the mesosphere with altitude. In fact, the coldest temperatures in the atmosphere are near the top of the mesosphere—about -90°C (-130°F). The atmosphere is thin here, but still thick enough so that meteors will burn up as they pass through the mesosphere—creating what we see as “shooting stars.” The upper boundary of the mesosphere is called the mesopause. The thermosphere is located above the mesopause and reaches out to around 600 kilometers (372 miles). Not much is known about the thermosphere except that temperatures increase with altitude. Solar radiation makes the upper regions of the thermosphere very hot, reaching temperatures as high as 2,000°C (3,600°F). The uppermost layer, that blends with what is considered to be outer space, is the exosphere. The pull of Earth’s gravity is so small here that molecules of gas escape into outer space.

#### Starlink’s satelites reach 340 Miles above earth’s surface.

Mann 19, [Adam Mann, 5-24-2019, "Starlink: SpaceX's satellite internet project," Space, <https://www.space.com/spacex-starlink-satellites.html>] Sachin

The first 60 Starlink satellites were launched on May 23, 2019, aboard a SpaceX Falcon 9 rocket. The satellites successfully reached their operational altitude of 340 miles (550 kilometers) — low enough to get pulled down to Earth by atmospheric drag in a few years so that they don't become space junk once they die.

#### Violation: 340 miles is less than the 372 miles necessary to be considered outer space; they explicitly defend only LEO

#### Vote neg:

#### 1] Limits and ground: the aff interpretation explodes the topic to allow any aff about space generally which structurally alters the neg research burden because there’s a qualitative difference between outer space and the atmosohere. Means we get no ground bc of how unpredictable the AC could be from round to round – kills core neg generics like space col bad and mining that don’t link if you specify a part of space

#### 2] Precision – Justifies the aff arbitrarily doing away with words in the resolution which gives way to affs about anything which obliterates neg prep.

#### Private multi-actor fiat is a voter --- proven by them spiking out of the enforcement question in CX

#### Use competing interps - Topicality is a binary question, you can’t be reasonably topical and it invites a race to the bottom of intervention

#### Drop the debater – dropping the argument doesn’t rectify abuse since winning T proves why we don’t have the burden of rejoinder against their aff.

#### No RVIS – it’s your burden to be topical

### 1NC - OFF

Unilat CP

#### The United States federal government should:

#### --Substantially increase active debris removal

#### --Should declare debris in space to be abandoned property, with the right to salvage, and make our expired satellites available for salvage

#### -- Contributing to debris removal projects and establishing a space situational awareness catalogue that requires satellite declassification and notice in the case of impending collision with the governments of formal allies of the United States

#### --ensure standardization and integration of all shared space situational awareness data.

#### Unilat solves comparatively much better than international cooperation for ADR---maintains leadership

--coop takes too long – proposed debris review in 1980 thru COPOUS and nothing happened

--timeframe is key – need to start now which flips solvency

--sufficiency - could remove 5 pieces now and make enviro more stable

--causes follow on – once we have the tech, others realize it’s feasible and do it too

--leadership is a nb – we are seen as taking moral highground to clean up

Ansdell 10 – PhD in Astronomy-U of Hawaii, MA in Space Policy-GWU

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US Leadership by Example

Need to Initiate Unilateral Action

International cooperation in space has rarely resulted in cost-effective or expedient solutions, especially in politically-charged areas of uncertain technological feasibility. The International Space Station, because of both political and technical setbacks, has taken over two decades to deploy and cost many billions of dollars—far more time and money than was originally intended. Space debris mitigation has also encountered aversion in international forums. The topic was brought up in COPUOS as early as 1980, yet a policy failed to develop despite a steady flow of documents on the increasing danger of space debris (Perek 1991). In fact, COPUOS did not adopt debris mitigation guidelines until 2007 and, even then, they were legally non-binding.

Space debris removal systems could take decades to develop and deploy through international partnerships due to the many interdisciplinary challenges they face. Given the need to start actively removing space debris sooner rather than later to ensure the continued benefits of satel- lite services, international cooperation may not be the most appropriate mechanism for instigating the first space debris removal system. Instead, one country should take a leadership role by establishing a national space debris removal program. This would accelerate technology development and demonstration, which would, in turn, build-up trust and hasten international participation in space debris removal.

POSSIBILITIES OF LEADERSHIP

As previously discussed, a recent NASA study found that annually removing as little as five massive pieces of debris in critical orbits could significantly stabilize the long-term space debris environment (Liou and Johnson 2007). This suggests that it is feasible for one nation to unilaterally develop and deploy an effective debris removal system. As the United States is responsible for creating much of the debris in Earth’s orbit, it is a candidate for taking a leadership role in removing it, along with other heavy polluters of the space environment such as China and Russia.

There are several reasons why the United States should take this leadership role, rather than China or Russia. First and foremost, the United States would be hardest hit by the loss of satellites services. It owns about half of the roughly 800 operating satellites in orbit and its military is significantly more dependent upon them than any other entity (Moore 2008). For example, GPS precision-guided munitions are a key component of the “new American way of war” (Dolman 2006, 163-165), which allows the United States to remain a globally dominant military power while also waging war in accordance with its political and ethical values by enabling faster, less costly war fighting with minimal collateral damage (Sheldon 2005). The U.S. Department of Defense recognized the need to protect U.S. satellite systems over ten years ago when it stated in its 1999 Space Policy that, “the ability to access and utilize space is a vital national interest because many of the activities conducted in the medium are critical to U.S. national security and economic well-being” (U.S. Department of Defense 1999, 6). Clearly, the United States has a vested interest in keeping the near-Earth space environment free from threats like space debris and thus assuring U.S. access to space

Moreover, current U.S. National Space Policy asserts that the United States will take a “leadership role” in space debris minimization. This could include the development, deployment, and demonstration of an effective space debris removal system to remove U.S. debris as well as that of other nations, upon their request. There could also be international political and economic advantages associated with being the first country to develop this revolutionary technology. However, there is always the danger of other nations simply benefiting from U.S. investment of its resources in this area. Thus, mechanisms should also be created to avoid a classic “free rider” situation. For example, techniques could be employed to ensure other countries either join in the effort later on or pay appropriate fees to the United States for removal services.

Recommendations for Leadership in Space Debris Removal

Going forward, the U.S. government should engage the commercial sector in space debris removal. Government contracts with several commercial firms would create a competitive environment, encouraging innovation and cost minimization. Having several companies working on the problem at the same time would also accelerate remediation as several critical orbits could be addressed at once. Furthermore, early investments in a domestic space debris removal industry would give the United States a head start in what may become a critical industry over the coming decades.

#### Causes international follow on --- Russia and China will go along separately later

--Russia and China will go along – otherwise they’d be pariahs and feel left out

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“The US government should support the development of best practices by following the lead of US commercial corporations, which have great sway internationally. For example, in human spaceflight, it is likely that US companies will lead the way in sub-orbital and orbital flights at least over the next decade. Coordination is already taking place among these companies in this regard. Similarly, asteroid mining companies are already coordinating informally on norms. The US Government could endorse these processes and begin to support these norms through its policy statements (such as the National Space Policy), enlisting other governments and their corporations to support them as well. Over time, if the bulk of Western governments and their corporations adopt such standards, China, Russia, and other possible outliers will likely find it beneficial to eventually join them. This may be easier than a straight political process.”

#### US commercial space leadership is necessary and sufficient to solve global Chinese dominance

--CP promulgates a set of standards initiated by the US – makes us first mover and shores up commercial space leadership

--China will dominate space and use it to create a new era of heg – need to have leadership and strong commercial sector

--will get to space and control info flows – selling satellites for cheap to poorest and broadcasting lies about US + shielding events in Tibet – undermines US cred and soft power

--will also get huge money from space and do sbsp – means they’ll have free energy to hold over the rest of the world

--Commercial sector key – need creative disruption, not bureaucracy and groupthink of the DOD to get to space quicker and more innovatively

Autry and Kwast 19 – Director of the Southern California Commercial Spaceflight Initiative-USC, PhD & former Prof of Entrepreneurship & Strategy-UC Irvine; Lt. Gen & Cmdr-USAF, Prof-Air University

Greg Autry, PhD & MBA-UC Irvine, Director of the Southern California Commercial Spaceflight Initiative-USC, served on the NASA Agency Review Team and as White House Liaison at NASA, former Professor of Entrepreneurship, Strategy, & Econ-UC Irvine, on the editorial board of the New Space Journal, co-author of Death by China, Beijing’s Fight for the Final Frontier, and Steven L. Kwast, Lt Gen-USAF, Commander & President of Air University-Maxwell AFB, MA in Public Policy-Harvard's Kennedy School of Government, former National Defense Fellow-Institute for the Study of Conflict, Ideology and Policy at Boston University, America Is Losing the Second Space Race to China, 22 August 2019, <https://foreignpolicy.com/2019/08/22/america-is-losing-the-second-space-race-to-china/>

America Is Losing the Second Space Race to China The private sector can give the United States a much-needed rocket boost. The current U.S. space defense strategy is inadequate and on a path to failure. President Donald Trump’s vision for a Space Force is big enough. As he said on June 18, “It is not enough to merely have an American presence in space. We must have American dominance in space.” But the Air Force is not matching this vision. Instead, the leadership is currently focused on incremental improvements to existing equipment and organizational structures. Dominating the vast and dynamic environment of space will require revolutionary capabilities and resources far deeper than traditional Department of Defense thinking can fund, manage, or even conceive of. Success depends on a much more active partnership with the commercial space industry— and its disruptive capabilities.

U.S. military space planners are preparing to repeat a conflict they imagined back in the 1980s, which never actually occurred, against a vanished Soviet empire. Meanwhile, China is executing a winning strategy in the world of today. It is burning hard toward domination of the future space markets that will define the next century. They are planning infrastructure in space that will control 21st-century telecommunications, energy, transportation, and manufacturing. In doing so, they will acquire trillion-dollar revenues as well as the deep capabilities that come from continuous operational experience in space. This will deliver space dominance and global hegemony to China’s authoritarian rulers.

Despite the fact that many in the policy and intelligence communities understand exactly what China is doing and have been trying to alert leadership, Air Force leadership has convinced the White House to fund only a slightly better satellite command with the same leadership, while sticking a new label onto their outmoded thinking. A U.S. Space Force or Corps with a satellite command will never fulfill Trump’s call to dominate space. Air Force leadership is demonstrating the same hubris that Gen. George Custer used in convincing Congress, over President Ulysses S. Grant’s better experience intuition, that he could overtake the Black Hills with repeating rifles and artillery. That strategy of technological overconfidence inflamed conflict rather than subduing it, and the 7th Cavalry were wiped out at the Battle of the Little Bighorn.

The West was actually won by the settlers, ranchers, miners, and railroad barons who were able to convert the wealth of the territory itself into the means of holding it. They laid the groundwork that made the 20th century the American Century and delivered freedom to millions of people in Europe and Asia. Of course, they also trampled the indigenous people of the American West in their wake—but empty space comes with no such bloody cost. The very emptiness and wealth of this new, if not quite final, frontier, however, means that competition for resources and strategic locations in cislunar space (between the Earth and moon) will be intense over the next two decades. The outcome of this competition will determine the fate of humanity in the next century.

China’s impending dominance will neutralize U.S. geopolitical power by allowing Beijing to control global information flows from the high ground of space. Imagine a school in Bolivia or a farmer in Kenya choosing between paying for a U.S. satellite internet or image provider or receiving those services for free as a “gift of the Chinese people.” It will be of little concern to global consumers that the news they receive is slanted or that searches for “free speech” link to articles about corruption in Western democracies. Nor will they care if concentration camps in Tibet and the Uighur areas of western China are obscured, or if U.S. military action is presented as tyranny and Chinese expansion is described as peacekeeping or liberation.

China’s aggressive investment in space solar power will allow it to provide cheap, clean power to the world, displacing U.S. energy firms while placing a second yoke around the developing world. Significantly, such orbital power stations have dual use potential and, if properly designed, could serve as powerful offensive weapons platforms.

China’s first step in this process is to conquer the growing small space launch market. Beijing is providing nominally commercial firms with government-manufactured, mobile intercontinental ballistic missiles they can use to dump launch services on the market below cost. These start-ups are already undercutting U.S. pricing by 80 percent. Based on its previous success in using dumping to take out U.S. developed industries such as solar power modules and drones, China will quickly move upstream to attack the leading U.S. launch providers and secure a global commercial monopoly. Owning the launch market will give them an unsurmountable advantage against U.S. competitors in satellite internet, imaging, and power.

The United States can still build a strategy to win. At this moment, it holds the competitive advantage in every critical space technology and has the finest set of commercial space firms in the world. It has pockets of innovative military thinkers within groups like the Defense Innovation Unit, under Mike Griffin, the Pentagon’s top research and development official. If the United States simply protects the intellectual property its creative minds unleash and defend its truly free markets from strategic mercantilist attack, it will not lose this new space race. The United States has done this before. It beat Germany to the nuclear bomb, it beat the Soviet Union to the nuclear triad, and it won the first space race.

None of those victories was achieved by embracing the existing bureaucracy. Each of them depended on the president of the day following the only proven path to victory in a technological domain: establish a small team with a positively disruptive mindset and empower that team to investigate a wide range of new concepts, work with emerging technologies, and test innovative strategies. Today that means giving a dedicated Space Force the freedom to easily partner with commercial firms and leverage the private capital in building sustainable infrastructure that actually reduces the likelihood of conflict while securing a better economic future for the nation and the world.

#### Hegemony solves extinction

Keck 14

Zachary Keck is Managing Editor of The Diplomat, The Diplomat, January 24, 2014, “America’s Relative Decline: Should We Panic?”, http://thediplomat.com/2014/01/americas-relative-decline-should-we-panic/

Regardless of your opinion on U.S. global leadership over the last two decades, however, there is good reason to fear its Regardless of your opinion on U.S. global leadership over the last two decades, however, there is good reason to fear its relative decline compared with China and other emerging nations. To begin with, hegemonic transition periods have historically been the most destabilizing eras in history. This is not only because of the malign intentions of the rising and established power(s). Even if all the parties have benign, peaceful intentions, the rise of new global powers necessitates revisions to the “rules of the road.” This is nearly impossible to do in any organized fashion given the anarchic nature of the international system, where there is no central authority that can govern interactions between states.

We are already starting to see the potential dangers of hegemonic transition periods in the Asia-Pacific (and arguably the Middle East). As China grows more economically and militarily powerful, it has unsurprisingly sought to expand its influence in East Asia. This necessarily has to come at the expense of other powers, which so far has primarily meant the U.S., Japan, Vietnam and the Philippines. Naturally, these powers have sought to resist Chinese encroachments on their territory and influence, and the situation grows more tense with each passing day. Should China eventually emerge as a global power, or should nations in other regions enjoy a similar rise as Kenny suggests, this situation will play itself out elsewhere in the years and decades ahead.

All of this highlights some of the advantages of a unipolar system. Namely, although the U.S. has asserted military force quite frequently in the post-Cold War era, it has only fought weak powers and thus its wars have been fairly limited in terms of the number of casualties involved. At the same time, America’s preponderance of power has prevented a great power war, and even restrained major regional powers from coming to blows. For instance, the past 25 years haven’t seen any conflicts on par with the Israeli-Arab or Iran-Iraq wars of the Cold War. As the unipolar era comes to a close, the possibility of great power conflict and especially major regional wars rises dramatically. The world will also have to contend with conventionally inferior powers like Japan acquiring nuclear weapons to protect their interests against their newly empowered rivals.

But even if the transitions caused by China’s and potentially other nations’ rises are managed successfully, there are still likely to be significant negative effects on international relations. In today’s “globalized” world, it is commonly asserted that many of the defining challenges of our era can only be solved through multilateral cooperation. Examples of this include climate change, health pandemics, organized crime and terrorism, global financial crises, and the proliferation of weapons of mass destruction, among many others.

A unipolar system, for all its limitations, is uniquely suited for organizing effective global action on these transnational issues. This is because there is a clear global leader who can take the initiative and, to some degree, compel others to fall in line. In addition, the unipole’s preponderance of power lessens the intensity of competition among the global players involved. Thus, while there are no shortages of complaints about the limitations of global governance today, there is no question that global governance has been many times more effective in the last 25 years than it was during the Cold War

#### Data-sharing with allies solves the aff

Loverro 14 – Deputy Assistant Secretary of Defense for Space Policy, Department of Defense

Douglas L., 3/12. “STATEMENT OF MR. DOUGLAS L. LOVERRO DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR SPACE POLICY BEFORE THE SENATE COMMITTEE ON ARMED SERVICES SUBCOMMITTEE ON STRATEGIC FORCES.” https://www.armed-services.senate.gov/download/loverro\_03-12-14

Our efforts here go beyond mere words – they are backed by actions. As I have discussed before, a key aspect of improving spaceflight safety, and assuring we can monitor the space environment more closely, is our space situational awareness (SSA) capabilities. We have been working on this for some time, and I am happy to report that we have made some real progress over the last year. That progress comes in two forms – new sensors and information sharing agreements.

On the sensor front, we have remained on a constant path for the last several years to reposition sensors where they can do the most good and to invest in new sensors where needed. Last year we reported that we had entered into an agreement with Australia to relocate and repurpose a launch tracking radar, the C-Band radar, from Antigua to western Australia to aid in our ability to monitor activities at low altitude in the southern hemisphere. That work is now underway. We complemented that effort with a second agreement signed with Australia this past November to relocate the DARPA-developed Space Surveillance Telescope to western Australia to give us an unmatched ability to track deep space objects in that critical region of the world. Additionally, after years of focused effort, and a sequestration-imposed six-month delay, we will soon award the contract for the first Space Fence site. The Space Fence will provide an unprecedented ability to track an order-of-magnitude greater number of objects in low earth orbit, supporting long-term spaceflight safety.

The Department has also made great strides in more transparently sharing SSA information with other space operators. Over the past year, U.S. Strategic Command (USSTRATCOM) has continued to pursue SSA sharing agreements with commercial companies and foreign governments, consistent with existing legislative authority. This year, USSTRATCOM signed five agreements with other governments – Australia, Japan, Italy, Canada, and France – and increased to forty-one our agreements with commercial satellite operators. Many more agreements are in varying stages of negotiation. We are committed to providing SSA services to enhance spaceflight safety for all.

While the purpose of these agreements is to allow us to share more advanced space flight safety products with other space-faring nations, they really serve to lay the groundwork for the next stage of effort – two-way data sharing. The space environment is too big and too complex for a single nation to bear the entire cost of monitoring it. Cost-effective SSA requires cooperation among space actors. The increasingly congested space environment means that an unparalleled level of information sharing is needed to promote safe and responsible operations in space and to reduce the likelihood of mishaps, misperceptions, and mistrust. We are currently engaged in detailed technical discussions with several nations that have space situational awareness capabilities to explore opportunities for two-way information exchange. This type of sharing will increase SSA information available to the United States while limiting unnecessary duplication of SSA capabilities. In short, we save money and improve safety for us and our allies.

### 1NC - OFF

Space Stalkers CP

#### The United States federal government should initiate cooperation with the People’s Republic of China and the Russian Federation to establish that simultaneously tailgating multiple foreign satellites in geosynchronous orbit constitutes aggression and that defending states have a right to preemptive self-defense.

#### The US will unilaterally develop and deploy bodyguard spacecraft to protect our satellites, but they’re destabilizing absent international guidelines --- also proves public sector sats are an alt cause to advantage 2

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Brian Chow, “Is It Time for ‘Space Arms Control’?,” *The National Interest*, December 9, 2018, <https://nationalinterest.org/blog/buzz/it-time-space-arms-control-38152>.

Since a legally-binding treaty cannot be attained in time to deal with the robotic threats by the early 2020s, the United States has no choice but to use unilateral measures in its military strategy to deal with the rapidly approaching robotic threats. As Schelling and Halperin said, “arms control is essentially a means of supplementing unilateral military strategy.” The voluntary measures proposed by the United States would be an element of arms control. Furthermore, as the United States lacks any viable alternative proposal at this time, the best and only option is to assume that SafeSat, including bodyguard spacecraft and self-defense zones, will be the unilateral military strategy for the following reasons:

First, when it comes to defense, the United States prefers passive defense such as maneuvering and resilient constellation. However, attackers can out-maneuver our satellites. In the 2020s, many critical satellites will have yet to be replaced by resilient constellations and the U.S. will need to use bodyguard spacecraft to actively defend these vulnerable, large, expensive and few-in-number legacy satellites.

Second, some countries are concerned that once the United States uses defensive weapons, these weapons can be readily re-tasked for offensive purposes. Moreover, an arms race of better and more weapons may ensue. Actually, this concern is one of the key reasons that the same peaceful robotic spacecraft or something similar in lethality and range are recommended to act as bodyguards. Since defenders (the American robotic spacecraft) and attackers (adversary’s robotic spacecraft) are the same type of spacecraft, this type of defense is a far more justifiable proportional response than an arms race.

In June 2018, the U.S. delegation to the Working Group on the Long-Term Sustainability of Outer Space Activities established by the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) in 2010 agreed that multilateral measures are needed for the safe conduct of “proximity space operations.” However, consensus was blocked by Russia, who sought more time to reach agreement on several guideline proposals including “precautionary measures aimed at precluding events that may compromise safety and security” of other countries’ satellites during “close-proximity space operations.”

Once differences with Russia and others are ironed out, some sort of UN COPUOS guideline on proximity space operations will likely be established. On the one hand, guidelines derived from consensus involve give and take and will not be perfectly tailored to U.S. national interests. On the other hand, any proximity guideline is still highly beneficial, because U.S. allies, friends and potential enemies can understand well in advance of crisis that stalking U.S. satellites with robotic spacecraft is an aggression and that the United States has the right to keep potential adversaries’ spacecraft away from its critical satellites. The United States should also focus on convincing the international community to support us in justifiably taking unilateral measures.

Conclusions

President Donald Trump has declared that “the United States will seek to deter, counter, and defeat threats in the space domain that are hostile to the national interests of the United States and our allies.” Therefore, the goal of arms control offices such as the Bureau of Arms Control, Verification and Compliance is to convey to the international community that placing spacecraft, for either peaceful or ASAT purposes, too close to a potential adversary’s satellites is an aggression and disallowed, and that the target country has the right to counter this threat even before an attack has begun.

I believe that the military strategy and the arms control proposed here will keep prosperity and peace in space far better than the status quo. For those who have different proposals at this eleventh hour, please speak now so that the United States can adjust its military strategy and arms control and be prepared within the next few years to counter these rapidly approaching robotic threats.

#### Directly interfacing with China and Russia is necessary and sufficient to solve international legal ambiguity and restore crisis stability

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Brian G Chow, “Stalkers in Space:  Defeating the Threat,” Strategic Studies Quarterly 11, no. 2 (Summer 2017): 82-116, <https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-11_Issue-2/Chow.pdf>.

Developing New Agreements on Weapons in Space

There is a silver lining in the emerging space-stalker threat if this threat finally convinces the international community that current proposals such as PPWT or no first placement of weapons in space have fundamental flaws. Many space weapons cannot be banned since they cannot be reliably distinguished from garden-variety satellites. Not resolving this flaw is a key reason no treaty on weapons in space exists in spite of repeated attempts since the dawn of the space age in 1957. Not only is the United States finding that the currently active proposals about weapons in space do not meet its national interests, but also it is losing international support on this matter. On 7 December 2015, the United Nations General Assembly adopted a Russian-led resolution, which initially was coauthored by Brazil and China, calling for a nonbinding restriction against the first placement of weapons in outer space. Only the United States, Ukraine, and Georgia voted against the resolution, while the states of the European Union, Australia, Japan, South Korea, and others totaled to 47 abstentions; 129 nations voted in favor. The United States must now take the initiative to introduce the countering of space-stalking threats as an added focus into UN disarmament fora. For example, the United States should pursue agreements in space transparency and confidence-building measures and agreements on a principle declaring the party that configures and readies the spacestalker attack as the aggressor and the defending state has the right of self-defense, including preemption even before the imminent attack, to reversibly or irreversibly negate the space-stalker threat.74 Against the emerging space-stalker threat, the United States must develop a policy concerning the conditions and timing under which self-defense could be used against a tailgating configuration threatening multiple satellites of another country. This new approach in dealing with weapons in space can address the US concerns about the draft PPWT and the proposal on no first placement of weapons in space without condemning the ideas. However, any proposal must explicitly resolve the concerns about space stalkers raised here. Specifically, the new approach should include these items:

• The definition of an aggressor must explicitly include one that poses a threatening configuration, and the defender must explicitly have the right of self-defense even before an imminent attack as the last resort.

• Because the word preemptive has the stigma of being used as a pretext for aggression, a new term should be developed and agreed upon to reflect the right to use self-defense before attack under necessary conditions as the last resort.

• The concept of self-defense zones against certain types of space weapons such as space stalkers is needed in conjunction with the outright ban of some other types of weapons in space. Selfdefense zones can be used to prevent attacks from close quarters. The zonal concept and banning need not be mutually exclusive and can be used complementarily. For example, the United States can participate in both international efforts to develop a self-defense zone against some weapons and ban other weapons that can be distinguished from ordinary satellite even when they are in space. Someday, countries including the United States might even agree to intrusive inspection by a UN-sanctioned team on satellites before launch so as to assure they cannot be effectively used as ASATs.

• The United States should develop a new proposal or a modification to PPWT for effectively dealing with weapons in space as opposed to the current passive strategy of opposing others’ proposals while losing international support.

• The US proposal must be able to deal with specific threats under specific situations. Being a defender, the United States cannot be satisfied with a general strategy and capability that deals with most of the threats but leaves holes for space stalkers.

• The United States should take advantage of the mechanism and offices already dealing actively with disarmament. For example, the definition of aggressor and the concept of a self-defense zone should be introduced into the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities under the United Nations. It should explicitly argue that effective defense is a prerequisite for effective deterrence. Also important are the international cooperation and coordination in space surveillance and agreement monitoring and verification.

• The US-proposed space measures and agreements, in conjunction with current US space defense capability, must be able to deal with contemporaneous threats, not just threats of the future. Even if future satellites could be equipped to be perfectly resilient, existing satellites will remain still critical and vulnerable.

The State Department should work closely with the DOD to propose, consult, and negotiate transparency and confidence-building measures and space agreements with the international community that account for the threat of space stalkers. Realistically, potential adversaries are far more likely to want the United Nations to adopt alternative space proposals, which ignore the space-stalking threat. If this occurs, the United States must be prepared to unilaterally declare a policy of preemptive defense and implement capabilities to deal with the space-stalker threat, supported by as many allies and friends as possible. Once potential adversaries recognize that the United States possesses an effective space deterrence and defense strategy including countering space stalkers, they may well reevaluate their own proposals and find themselves better off by joining the realistic approach of the United States and other nations in keeping the peace in space.

#### Bans can’t address unique dual use threats – only the plan can

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Brian G Chow, “Stalkers in Space:  Defeating the Threat,” Strategic Studies Quarterly 11, no. 2 (Summer 2017): 82-116, <https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-11_Issue-2/Chow.pdf>.

A Neglected Focus

The most worrisome threat from space stalkers is their use for a surprise attack by simultaneously disabling critical satellites. As early as 2001, the Rumsfeld Commission worried that “the U.S. is an attractive candidate for a ‘Space Pearl Harbor,’ ” and space stalkers could be the instrument to turn that worry into a fateful reality.24 The commission also issued a warning: “The question is whether the U.S. will be wise enough to act responsibly and soon enough to reduce its space vulnerability. Or whether, as in the past, a disabling attack against the country and its people—a ‘Space Pearl Harbor’—will be the only event able to galvanize the nation and cause the U.S. Government to act.”25 The argument here aims to spur responsible US action—and soon.

Whether by design or luck, China’s ASAT developmental activities and space arms-control proposals since the 2007 test could make the United States and the international community continue to focus on countering ground-based ASAT threats and neglect emerging spacebased stalkers. For example, on 13 May 2013, China fired a ballistic missile reaching an altitude of “possibly over 20,000 miles,” whereas the geosynchronous Earth orbits (GEOs) are at 22,236 miles. In a paper requested by the U.S.-China Economic and Security Review Commission, Cray Murray, senior policy analyst at the commission, stated “available data suggests it was intended to test at least the launch vehicle component of a new high-altitude ASAT capability.26 Tests since 2007 made the United States consider the growing traditional ground-launched ASAT threats to be much more urgent than space stalkers and thus focused the US Strategic Portfolio Review,27 space budget increase, and new programs on these traditional threats.

In congressional testimony on 15 March 2016, Douglas Loverro, deputy assistant secretary of defense for space policy, stated, “To deter space attack, would-be attackers need to understand or at least suspect that their attacks will likely be unsuccessful. . . . As we’ve worked through that calculus we arrive at the conclusion that of the three pathways we’ve outlined— reconstitution, defensive operations, and resilience—resilience is the best path for both understandable assurance and robust assurance. It’s also the area where we can best offset the advantages that adversaries seek to exploit with their offensive space control ambitions.”28 Loverro provided no indication of how to deal with space stalkers or the level of resilience needed to deny the effectiveness of stalkers. His three pathways do not provide sufficient defense against space stalkers.

Reconstitution takes time, and the US fighting force cannot wait that long. Also, not knowing which types of critical satellites would be targeted and destroyed, the United States could not afford to fund a quick and adequate reconstitution on all critical types.

Defensive operations, whether passive or active, would require adequate warning time of the pending attack to initiate and execute actions to block the attack. If space stalkers are allowed to tailgate satellites closely, there would not be enough time to mount an effective defense.

In the same testimony, Loverro described better anti-jam and antispoof technologies, more resilient next-generation satellites, life extension of on-orbit legacy satellites, and partnerships with allied nations and commercial partners.29 These resilience measures are aimed at the rapidly growing traditional space threats. Against space stalkers, these measures cannot meet his aforementioned requirement for deterrence by providing “understandable assurance and robust assurance” that “their attacks will likely be unsuccessful.” There are two reasons that resilience is inadequate in countering the emerging space-stalking threat. First, passive defenses, such as anti-jamming and evasive maneuver, would be either irrelevant or ineffective against space stalkers even if the defenses were executed preemptively, because space stalkers could dedicate much of their on-board resources (such as fuel and propulsion) for the sole purpose of attack, including chasing down an escaping target satellite. Second, backups drawn from partners might have lower capability and take time to resume lost services, and partners might not be able to spare the full capacity requested by the United States.

More importantly, as stated in the 2011 National Security Space Strategy, the current strategy for “preventing and deterring aggression against space infrastructure”—including satellites—has been focusing on countering traditional ground-based ASAT weapons such as direct-ascent ballistic missiles, jammers, and lasers. The strategy has five elements:

1. “Support diplomatic efforts to promote norms of responsible behavior in space.”

2. “Pursue international partnerships that encourage potential adversary restraint.”

3. “Improve our ability to attribute attacks.”

4. “Strengthen the resilience of our architectures to deny the benefits of an attack.”

5. “Retain the right to respond, should deterrence fail.”30

These five elements either have not been used to deal with the emerging space stalker threat or are far from adequate to counter it. The first two elements are important in establishing international norms to justifiably and fairly counter space stalkers, as these elements are the best way to develop mutual understanding and arrive at mutually beneficial compromise. Unfortunately, exchanges and measures developed thus far tend to focus on space activities during peacetime. As far as weapons in space and deterrence of space war are concerned, the diplomatic efforts and international partnerships have been focusing on either the unattainable goal of banning all weapons in space or the endless debate about the control of traditional Earth-based ASAT threats, but to the neglect of the emerging space-stalker threat. While the emphasis of the third element has been on attributing traditional space attacks, it should have been stated explicitly to include the attribution of space stalkers not just after, but also before, the attack. The fourth element would provide far too little survivability to many of the critical satellites already on orbit, because they cannot be retrofitted on orbit to be resilient or reconstituted quickly and adequately enough to perform the same lost capability. Finally, after space-stalking attacks begin, the response according to the fifth element would be too late to save US-critical satellites. Retaliation would not deter Chinese space stalking, because destroying such critical satellites would benefit China far more than the cost of US punishment as a proportional response. China could deter US intervention without firing a terrestrial shot or even a shot from space stalkers, as merely being too close for comfort would suffice. This outcome may well be the ultimate goal of China’s counterspace strategy. In sum, while current efforts to implement the National Security Space Strategy might protect satellites or their missions against traditional threats, these efforts alone cannot protect satellites against simultaneous space-stalker attacks, because these attacks do not provide adequate warning for defense.

As discussed in the previous section, a space weapons ban proposed by China and Russia cannot ban space stalkers. Can any other space proposal deal with the presence of space stalkers? Over the years, the most ambitious one that focused on peaceful and dangerous space activities was proposed by the Stimson Center. Michael Krepon and his colleagues posted the initial draft of “Model Code of Conduct for the Prevention of Incidents and Dangerous Military Practices in Outer Space” on the Stimson Center’s website in 2004. Stimson’s Code originally was intended to deal with all space activities, whether peaceful civil and military activities or dangerous military practices. The latter include ASATs and others agreed by party members as dangerous. However, this Code could not deal with space stalkers because their physical appearance and activities cannot be reliably distinguished from those of peaceful civil and military satellites.

The Stimson’s Code and efforts did have a significant influence on the European Union’s (EU) Space Code of Conduct. Its latest version, “Draft International Code of Conduct for Outer Space Activities,” was released in 2014.31 It focuses on accidental collisions from space, as opposed to intentional collisions from ASATs, where space stalkers belong. Both the Stimson Center and the EU decided to focus on peaceful activities, because such a focus would be relatively far more acceptable to the major spacefaring nations as well as a more diverse group of nations. Therefore, it is unlikely the EU Space Code would now go back to including dangerous military activities or practices. Moreover, since the EU Code merely relies on public shaming, it is suitable for managing peacetime space activities but not for deterring a space war. In a crisis, China could be willing to be shamed by breaking an agreement if it could significantly degrade US space mission capability for war-fighting support or, better yet, deter US intervention in the first place without firing a shot in space or on Earth.

Similar to government officials’ statements, major reports from think tanks and other research organizations focus on how to deal with the rapidly growing traditional threats, not the emerging space-stalker threat from rendezvous-and-proximity operations (RPO). In his 2010 treatise Deterrence and First-Strike Stability in Space: A Preliminary Assessment, Forrest Morgan did not mention China’s RPOs at all. He argued generally for “a national space policy that explicitly condemns the use of force in space and declares that the United States will severely punish any attacks on its space systems and those of friendly states in ways, times, and places of its choosing.”32 His punishment or retaliation could not protect the satellites being attacked and, as discussed above, the benefits of such an attack to China could far exceed the punishment China might incur. In any case and as stated earlier, punishment does not meet Loverro’s requirement for deterrence: “To deter space attack, would-be attackers need to understand or at least suspect that their attacks will likely be unsuccessful.”33 Therefore, regardless whether Morgan’s policy could deter traditional space attacks, it could not induce would-be attackers to believe that “their attacks will likely be unsuccessful.” On the contrary, China could be convinced that once enough critical satellites are disabled, the United States could either fight with inadequate space support or simply not intervene at all. Morgan is also a key author of the U.S.-China Military Scorecard: Forces, Geography, and the Evolving Balance of Power 1996–2017, released in 2015. The focus is again exclusively on traditional threats without any mention of RPOs.34

In January 2016, the Center for a New American Security released the report U.S. Defense Strategy for Space, by Elbridge Colby.35 He focused on traditional space threats from missiles, jammers, and lasers and did not mention RPOs, including their potential threats.

In April 2016, the National Bureau of Asian Research released a special report, which contains an article by Brian Weeden and Xiao He on US-China strategic relations in space. They did discuss RPOs and stated that, “A more promising approach is to focus on transparency and confidencebuilding measures [TCBM] for both direct ascent and RPO. TCBMs are a means by which governments can share information to help create mutual understanding and trust and reduce misperceptions and miscalculations.”36 They also described how space situational awareness (SSA) capability can detect and monitor close approaches.37 However, while TCBMs and SSA are important, they are far from adequate to deter or protect satellites targeted by space stalkers and do not meet Loverro’s requirement for deterrence cited above.

In June 2016, Rebeccah Heinrichs of the Hudson Institute released a report on “Space and the Right to Self Defense,” which did not mention RPOs.38 The report focused on the desirability of space-based interceptors for ballistic missile defense. Also in June 2016, the Atlantic Council released a paper, Toward a New National Security Space Strategy: Time for a Strategic Rebalancing, by Theresa Hitchens and Joan Johnson-Freese. They asserted that “maneuverable satellites being developed in the United States and elsewhere for rendezvous-and-proximity operations (RPO) are often considered nefarious capabilities by potential adversaries, causing finger pointing in both directions.”39 They did not offer a prescription to deal with RPOs or any other specific threat. Similar to other reports, the Hitchens–Johnson-Freese study is a high-level report and argues for a rebalancing, which “would require a continued emphasis on strategic restraint in the very near term, as well as a continued focus on diplomacy.”40

Finally, in August 2016, the National Academies of Sciences, Engineering, and Medicine released a report titled National Security Space Defense and Protection: Public Report. 41 It is also a high-level report and does not mention RPOs or their use for attack.

Preemptive Defense against Space Stalkers

A successful defense against space stalkers will benefit not only the United States but also other nations. Many nations rely on US satellites such as the Global Positioning System (GPS) and communications satellites for critical services. Also, a multilateral or international agreement based on the same concept and measures to protect US satellites would protect other nations’ satellites as well, including those of China and Russia.

On 15 November 2014, Secretary of Defense Chuck Hagel announced the Defense Innovation Initiative (DII), “a broad Department-wide initiative to pursue innovative ways to sustain and advance our military superiority for the 21st Century and improve business operations throughout the Department.”42 He said that the DII is “an initiative that we expect to develop into a game-changing third ‘offset’ strategy.” Subsequent Secretary of Defense Ashton Carter continued to pursue this third offset strategy. Hagel’s pronouncements and Carter’s actions provide the needed attention and resources to deal with the space-stalker threat, which calls for a new operational concept such as preemptive self-defense as the last resort.

Deterring and defending against space stalkers starts with two principles. First, once a space object is in orbit, one cannot reliably distinguish an ordinary satellite from a space stalker. Thus space stalkers cannot be banned without banning all satellites. This indistinguishability explains the difficulty in verifying violations in the joint proposal of PPWT by Russia and China for banning space weapons, which include space stalkers. An alternative to their proposal is that the international community instead bans dangerous positioning of space objects, which can be satellites and/or space stalkers. Banning dangerous configurations is observable and verifiable. Second, routine space operations could bring one or even a few space objects close to another nation’s satellites at the same time. These occurrences cannot be prohibited and must be accommodated.

The above two principles are analogous to the Third United Nations Convention on the Law of the Sea (UNCLOS III), or simply the Law of the Sea, adopted in 1982. Unlike PPWT attempting to ban weapons in space, UNCLOS III does not ban warships or attack submarines at sea but, instead, allows states to exercise control over contiguous areas. Two concepts, if modified, can be applied to deal with space stalkers, with or without a space agreement.

First is contiguous zone, within which “the coastal State may exercise the control necessary to (a) prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea; [and] (b) punish infringement of the above laws and regulations committed within its territory or territorial sea.”43

The application to space is by having a self-defense zone around a nation’s satellite and having the right to “punish infringement” as stated above.44 Even with the self-defense zone, the owner of the satellite would continue to comply with Article II of the 1967 Outer Space Treaty that “outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.”45 While the owner of the satellite does not have sovereignty over the self-defense zone, the United States can propose, according to Article IX of the 1974 Convention on Registration of Objects Launched into Outer Space, that this Convention be amended to automatically include the self-defense zone in the registration of the satellite to be launched or, retroactively, already launched into space.46

Second, Article 17 of UNCLOS III says “ships of all States, whether coastal or land-locked, enjoy the right of innocent passage through the territorial sea.”47 Similarly in space, satellites of all states enjoy the right of passage through the self-defense zones of others, provided it is innocent and not part of a threatening configuration to multiple satellites.

Implementing Preemptive Self-Defense against Space Stalkers

The purpose of preemption is to prohibit the positioning of space objects to tailgate (or closely lead) more than an innocuous threshold number of another country’s satellites. The Space Security and Defense Program already established by the DOD and the National Intelligence Office should decide whether the threshold is three, four, five, or some other number. Once the threshold is determined, the United States can plan to use preemption as the last resort against the threat of space stalkers with a number exceeding the threshold. At the same time, the United States can plan to use traditional, postattack self-defense to protect satellites or their missions or to deter satellite attacks. Since preemption eliminates the far more damaging attacks that result from a larger number of space stalkers, it makes the job of post-attack self-defense feasible. Moreover, since there is no peaceful reason to tailgate so many satellites at the same time, simultaneously stalking a large number of another nation’s satellites is justifiably treated as hostile intent requiring a last-resort preemption to neutralize such a threat. This is equally justified as the proper use of self-defense. The ultimate purpose of last-resort preemptive self-defense is that it does not actually have to be executed.

Therefore, the adversary knowing its space-stalking attack to be futile would not pose a space-stalking threat in the first place. In any case, declaring, during peacetime, the US right of self-defense to prevent an imminent space-stalking attack can garner international condemnation of anyone setting up such a threat during a crisis and international support of US defensive actions. This declaration could also reduce incentives for an aggressor to pose the space-stalking threat.

One could define a geosynchronous satellite as tailgating if its longitude of the ascending or descending node or orbital plane’s inclination is less than 0.2 degree from that of another country’s satellite already occupying that orbit. If the United States wants to deter and defend against simultaneous space-stalking attacks against GEO satellites, it could declare that any country that positions its space objects within 0.2 degree in longitude (148 km in minimum separation) or inclination of more than a threshold number of another country’s satellites is the aggressor and the defender has the right to exercise self-defense even before any actual attacks begin. The threshold number could be between three and five. However, the actual threshold, as well as the minimum separation, should be first determined by the DOD and then brought to the international community by the State Department for discussion and negotiation. It is feasible to arrive at both useful and practical thresholds. For example, both the United States and China need not reposition any of their operational satellites to observe the above suggested rule of 0.2-degree minimum satellite separation between any pair of US-China GEO satellites.48

The rapidly growing number of small (less than 500 kg) satellites forces the need to observe guidelines on their orbital placements so their deployment would not appreciably enhance the space-stalking threat but would maintain much of their civil benefits. Space expert John Bradford reported 36 successful launches of microsatellites (typically defined as 10 kg to 50 kg) and nanosatellites (1 kg to 10 kg) in 2012; 92 in 2013 and 158 in 2014.49 In January 2015, WorldVu Satellites Ltd. said it had secured Qualcomm Inc. and Virgin Group as investors in the OneWeb satellite Internet network. The network is planned to have some 650 125-kg satellites operating at 1,200-km altitude.50 In June 2015, SpaceX filed a proposal to test a very large fleet of 4,025 small satellites for high-speed Internet service to be launched over a period of 15 years to around 1,200-km altitude.51 Thus, thousands of small satellites will populate low Earth orbits (LEO) in the near future. The concern is that China or Russia could make space stalkers in the form of small satellites and conceal them among other small satellites. This concern should be addressed now, not after more small satellites are planned or launched. Since all these satellites aim to be cheap for predominately communications and Earth observation, they are placed in LEOs. There should be an international understanding or agreement that they will not be placed in or travel to GEOs or medium Earth orbits (MEO). This restriction would not affect the utility of small satellites because there are few commercial reasons for them to be placed in those higher orbits.

The prohibition of positioning a space-stalking threat for simultaneous attacks can and should first be applied to GEOs as described in this article. For MEOs and elliptical Earth orbits (EEO), no country would need to change its current satellite orbits to meet the guidelines in this article to deal with the space-stalker threat, as their satellites in these orbits are already well separated from those of every other country’s. As to LEO satellites, which will soon number in the thousands, closeproximity restrictions can still be established with an approach similar to that for GEOs. However, the design of the prohibition for LEOs should be discussed along with other issues including:

• how DOD’s plan for disaggregating large LEO satellites for better mission survivability will work;

• how DOD’s arrangements with commercial providers and other governments in using their space and other assets for backup will work;

• which types of LEO satellites DOD needs to protect against simultaneous attacks by multiple space stalkers;

• how transparent should be the function and capability of small satellites to the international community; and

• how several thousand small satellites launched into LEO can be made to avoid collisions and creating space debris.

Since GEOs host many critical satellites for space-faring nations, if the prohibition against threatening space stalkers were only enforced there, the chance of triggering a war in space that spreads to Earth could be reduced.

There are two ways to lighten the burden of monitoring space stalkers. First, there is no need to monitor space objects belonging to friends and allies of the United States. Second, neither is there a need to monitor space objects from countries that do not possess a capability of carrying out multiple space-stalking attacks. Thus, Russia and China are the key countries to watch for this type of attack in the near term.

Because the Joint Space Operations Center (JSpOC) is already monitoring the movement of all operational satellites worldwide, monitoring any adversary’s maneuvering and positioning of its space objects for multiple space-stalking attacks would be part of its responsibility. The sensors and process to alert satellite owners of potential collisions can also be used to alert the US military of potential space-stalking attacks, if JSpOC is provided with warning criteria for such imminent attacks. In addition to ground-based optical and radio telescopes and the spacebased space surveillance constellation, the Geosynchronous Space Situational Awareness Program (GSSAP) can and should play a major role in the defense against space stalkers. Two GSSAP satellites were launched successfully into a near-geosynchronous orbit in July 2014. Gen William Shelton, former commander of Air Force Space Command, told reporters that “this neighborhood watch twosome will help protect our precious assets in GEO (high-altitude orbit), plus they will be on the lookout for nefarious capability other nations may try to place in that critical orbital regime.”52 An Air Force fact sheet states,

GSSAP satellites will operate near the geosynchronous belt and will have the capability to perform rendezvous and proximity operations (RPO). RPO allows for the space vehicle to maneuver near a resident space object of interest, enabling characterization for anomaly resolution and enhanced surveillance, while maintaining flight safety. Data from GSSAP will uniquely contribute to timely and accurate orbital predictions, enhancing our knowledge of the geosynchronous orbit environment, and further enabling space flight safety to include satellite collision avoidance.”53

Just as with JSpOC, the GSSAP can be used for both avoiding accidental collision and alerting DOD of potential space stalkers and helping to defend against them. Also, since a GSSAP satellite can perform RPO, it can get extremely close to a space object for an inspection. Although the GSSAP satellite might not have a very high confidence of distinguishing a space stalker from a garden-variety satellite, a close-up inspection might still identify suspicious space objects and keep a close eye on them, especially those that can maneuver and move quickly. The Air Force launched another pair of GSSAP satellites in August 2016.

Since the civil use of the RPO capability is crucial to both countries, this dual-use capability is unlikely to be banned. On the other hand, in principle an RPO capability, such as one manifested in GSSAP satellites, could be tasked to attack Chinese satellites. The United States should declare that the prohibition of space stalkers in threatening their prey is a two-way street and would not so position multiple GSSAP satellites and other space-stalking-capable satellites to threaten Chinese satellites. Thus, China would benefit from this declaration or agreement as well. Also, the United States does not need to conduct multiple RPOs at the same time and would sacrifice little in not doing so.

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Cyber DA

#### Cyber attacks on critical infrstructure are coming now

Underwood 20 [Kimberly Underwood is a reporter on emerging communication technologies, cyberwarfare, the intelligence community, military command operations and weaponry research. “China is Retooling, and Russia Seeks Harm to Critical Infrastructure.” June 24, 2020. https://www.afcea.org/content/china-retooling-and-russia-seeks-harm-critical-infrastructure]

Intelligence leader warns of the mounting threats of cyber espionage, digital attacks and influence operations from adversaries. U.S. adversaries are trying to take control of cyberspace as a medium, resulting in implications to our freedom of maneuver and access in cyberspace, says Brig. Gen. Gregory Gagnon, USAF, director of Intelligence (A2), Headquarters Air Combat Command (ACC), Joint Base Langley-Eustis. Increasing cyberspace activity is coming from China, Russia, Iran and North Korea. “We are seeing it not just in volume, but we are seeing an expansion in the ways that they use cyberspace, whether it is to steal information, whether it is to directly influence our citizens or whether it is to disrupt critical infrastructure,” Gen. Gagnon reports. The general spoke at the AFCEA Tidewater chapter’s recent monthly virtual luncheon. China and Russia continue to pose the greatest espionage and cyber attack threats to the United States, but the intelligence leader anticipates that other adversaries and strategic competitors will also build and integrate cyber espionage, cyber attacks and influence operations into how they conduct business. “Our strategic competitors will increasingly use cyber space capabilities including cyber espionage, cyber attack and continued influence operations to seek political, economic and military advantage over the United States, our allies and our partners,” he said. “This is not an ‘if,’ it is a yes. They are doing it and they will continue.” Gen. Gagnon warned that China in particular is using cyber espionage to collect intelligence, target critical infrastructure and steal intellectual property. It is all part of China’s plan to move from being a regional actor to being seen as a global power. The shift also means a greater role for the adversary’s military. The Chinese military is in the process of transitioning from a defensive, inflexible ground-based force charged with domestic and peripheral security to a joint, highly agile, expeditionary and power projecting arm of Chinese foreign policy, he noted. “What is going on in China is a dynamic revectoring of the objectives and goals of the People's Liberation Army,” Gen. Gagnon said. “This is not a small change. This is a major change in course and direction. They're doing it to be a power projection arm of a Chinese foreign policy that engages both in military diplomacy and operations around the globe, but also in predatory economic activity.” Moreover, China’s military spending in 2018 exceeded $200 billion, an increase of about 300% since 2002, the general stated. And while it is not the $750 billion that the United States government spends every year on military defense, the Chinese funding does not reflect the same level of investment in manpower or healthcare. A good portion of their $200 billion directly funds technology and capabilities. “A big chunk of our budget is not buying kit,” Gen. Gagnon explained. “If you're the CCP [Chinese Communist Party], you don't have the same extensive retirement programs that you have to pay for,” he said. “You don't have this extensive healthcare which you have to provide. So, when you think about $200 billion, think about that buying kit and buying operations. That is significant.” To the industry, Gen. Gagnon warned companies that Beijing will authorize Chinese espionage against key U.S technologies. “Many of your corporations hold this technology,” he stressed. “They are trying to undercut your ability to be profitable by developing those same technologies in China. They are competing against us in the international market. I will tell you that China's persistent cyber espionage threat and their growing tech threat to our core military and critical infrastructure will continue to be persistent. China remains the most active strategic competitor responsible for cyber espionage against corporations and allies.” China, like Russia, is also increasing its information warfare against the United States. “They are becoming more adept at using social media to deliver messages directly to the U.S. population that alter the way we think, the way we behave and the way we decide,” the general observed. The improvement of their cyber attack capabilities and ways to alter information online is intended to shape views inside China, shift the mindset of Chinese people around the world, as well as to try to shape the world’s view, not just of China, but also of the United States. “You are seeing that play out in the pandemic, how people view us around the world,” he offered. “We're also concerned about Chinese intelligence and security services,” the A2 continued. “They use Chinese information technology firms as routine and systemic espionage platforms against the United States and against our allies. Many of you are tracking what is in the news about 5G and Huawei, and that's what we're talking about.” As for Russia, their highly capable operations of cyber espionage, influence and cyber attacks continue to target the United States and its allies. In particular, Russia’s form of integrating cyber espionage attacks and influence operations, or information confrontation, is very effective, Gen. Gagnon emphasized. “If you think about it, they’re generally playing with the weaker hand, so they have been rather brilliant on the international stage in achieving their foreign policy objectives,” he said. In addition, Moscow is staging cyberattack assets to disrupt or damage U.S. military or civilian information systems during the COVID-19 pandemic. “There is activity that they undertake on a day-to-day basis to try to gain a decisive military intelligence,” he stated. “Their security services continue to target our systems, both for U.S. information systems and critical infrastructure, as well as the networks of our NATO and Five-Eye partners. They do it for positional advantage in cyberspace to be able to do the five Ds: deceive, deny, disrupt, degrade and destroy our assets, but also to gain intelligence on how systems are established and set up so that they can maintain attack vectors.” Russia also is targeting U.S. critical infrastructure, the general cautioned. “Russia has the ability to execute cyber attacks in the United States that can generate localized temporary disruptive effects on critical infrastructure, such as disrupting electric distribution networks for at least a few hours.” In fact, he warned, Moscow is mapping out critical infrastructure with the long-term goal of being able to cause “substantial damage.”

#### Megaconstellations function as critical infrastructure that increase resiliency and protect against cyberattacks

Hallex and Cottom 20 [Matthew A. Hallex is a Research Staff Member at the Institute for Defense Analyses. Travis S. Cottom is a Research Associate at the Institute for Defense Analyses. “Proliferated Commercial Satellite Constellations: Implications for National Security.” 2020. https://ndupress.ndu.edu/Portals/68/Documents/jfq/jfq-97/jfq-97\_20-29\_Hallex-Cottom.pdf?ver=2020-03-31-130614-940]

While potentially threatening the sustainability of safe orbital operations, new proliferated constellations also offer opportunities for the United States to increase the resilience of its national security space architectures. Increasing the resilience of U.S. national security space architectures has strategic implications beyond the space domain. Adversaries such as China and Russia see U.S. dependence on space as a key vulnerability to exploit during a conflict. Resilient, proliferated satellite constellations support deterrence by denying adversaries the space superiority they believe is necessary to initiate and win a war against the United States.28 Should deterrence fail, these constellations could provide assured space support to U.S. forces in the face of adversary counterspace threats while imposing costs on competitors by rendering their investments in counterspace systems irrelevant. Proliferated constellations can support these goals in four main ways. First, the extreme degree of disaggregation inherent in government and commercial proliferated constellations could make them more resilient to attacks by many adversary counterspace systems. A constellation composed of hundreds or thousands of satellites could withstand losing a relatively large number of them before losing significant capability. Conducting such an attack with kinetic antisatellite weapons—like those China and Russia are developing—would require hundreds of costly weapons to destroy satellites that would be relatively inexpensive to replace. Second, proliferated constellations would be more resilient to adversary electronic warfare. Satellites in LEO can emit signals 1,280 times more powerful than signals from satellites in GEO.29 They JFQ 97, 2nd Quarter 2020 Hallex and Cottom 25 also are faster in the sky than satellites in more distant orbits, which, combined with the planned use of small spot beams for communications proliferated constellations, would shrink the geographic area in which an adversary ground-based jammer could effectively operate, making jammers less effective and easier to geolocate and eliminate.30 Third, even if the United States chooses not to deploy national security proliferated constellations during peacetime, industrial capacity for mass-producing proliferated constellation satellites could be repurposed during a conflict. Just as Ford production lines shifted from automobiles to tanks and aircraft during World War II, one can easily imagine commercial satellite factories building military reconnaissance or communications satellites during a conflict. Fourth, deploying and maintaining constellations of hundreds or thousands of satellites will drive the development of low-cost launches to a much higher rate than is available today. Inexpensive, high-cadence space launch could provide a commercial solution to operationally responsive launch needs of the U.S. Government. In a future where space launches occur weekly or less, the launch capacity needed to augment national security space systems during a crisis or to replace systems lost during a conflict in space would be readily available.31

#### Cyberattacks cause extinction---false warnings, stealing nukes, and introducing vulnerability

Ernest J. Moniz et al. 18, Ernest J. Moniz is the CEO of the Nuclear Threat Initiative, served as the thirteenth United States Secretary of Energy from 2013 to January 2017. Sam Nunn, and Des Browne, September 2018, “Nuclear Weapons in the New Cyber Age,” https://media.nti.org/documents/Cyber\_report\_finalsmall.pdf

The Cyber Threat to Nuclear Weapons and Related Systems

Cyber-based threats target all sectors of society—from the financial sector to the entertainment industry, from department stores to insurance companies. Governments face an even more critical challenge when it comes to cyberattacks on their most critical systems. Attacks on critical infrastructure could have extraordinary consequences, but a successful cyberattack3 on a nuclear weapon or related system—a nuclear weapon, a delivery system, or the related Nuclear Command, Control, and Communications (NC3) systems—could have existential consequences. Cyberattacks could lead to false warnings of attack, interrupt critical communications or access to information, compromise nuclear planning or delivery systems, or even allow an adversary to take control of a nuclear weapon.

Given the level of digitization of U.S. systems and the pace of the evolving cyber threat, one cannot assume that systems with digital components—including nuclear weapons systems—are not or will not be compromised. Among the reasons: nuclear weapons and delivery systems are periodically upgraded, which may include the incorporation of new digital systems or components. Malware could be introduced into digital systems during fabrication, much of which is not performed in secure foundries. In addition, there are a range of external dependencies, such as connections to the electric grid, that are outside the control of defense officials but directly affect nuclear systems. Finally, the possibility always exists that an insider, either purposefully or accidentally, could enable a cybersecurity lapse by introducing malware into a critical system.

Increased use of digital systems may also adversely affect the survivability of nuclear systems. New technologies can enhance reliability and performance, but they can also lead to new vulnerabilities in traditionally survivable systems, such as submarines or mobile missile launchers.4