### 1NC – PIC – Solar Energy

#### CP Text: The appropriation of outer space by private entities is unjust except for the appropriation of the sun for Solar Energy.

#### Space-solar tech coming now, private entities are key – it’s impossible to be weaponized

Snowden 19 (Mar 12, 2019,01:29pm EDT|48,669 views Solar Power Stations In Space Could Supply The World With Limitless Energy Scott Snowden Scott SnowdenContributor Sustainability, Forbes, <https://www.forbes.com/sites/scottsnowden/2019/03/12/solar-power-stations-in-space-could-supply-the-world-with-limitless-energy/?sh=229b778b4386)//ww> pbj

While on the surface of the Earth, society still struggles to adopt solar energy solutions, many scientists maintain that giant, space-based solar farms could provide an environmentally-friendly answer to the world's energy crisis. Only last week, we reported that China was planning to build the world's first solar power station to be positioned in Earth's orbit. Because the sun always shines in space, an orbital solar power station is seen as an inexhaustible source of clean energy. "Above the Earth, there's no day and night cycle and no clouds or weather or anything else that might obstruct the sun's ray, so a constant power source is available," said Ali Hajimiri, professor of electrical engineering at the California Institute of Technology and co-director of the university’s Space Solar Power Project. The multi-rotary SPS (MR-SPS) concept is one with multiple independent solar sub-arrays used to... [+] point to the sun. The multi-rotary SPS (MR-SPS) concept is one with multiple independent solar sub-arrays used to... [+] NASA Collecting solar power in space and wirelessly transmitting was first described by Isaac Asimov in 1941 in his short story Reason. In 1968, American aerospace engineer Peter Glaser published the first technical article on the concept – Power From The Sun: Its Future in the journal Science. Space-based solar power attracted considerable attention in the 1970s as the necessary individual technical components – in essence, photovoltaic cells, satellite technology and wireless power transmission – were developed. Despite the concept being technically feasible, it was considered economically unrealistic at the time and research ultimately stalled. “The idea seems to be going through a resurgence and it’s probably because the technology exists to make it happen,” said John Mankins, a former NASA scientist who was at the forefront of this field in the 1990s, before it was abandoned. Aerospace engineer Peter Glaser first wrote about the idea in 1968. Aerospace engineer Peter Glaser first wrote about the idea in 1968. SCIENCE MAGAZINE Global energy demands are only going to grow, says Hajimiri. The global population is expected to reach a staggering 9.6 billion by 2050, according to a United Nations report, so methods of generating large quantities of clean energy must be found. A space-based solar power system could provide energy to everyone, even in places that don't receive sunlight all year round, like northern Europe and Russia. In April of 2015, a research agreement between Northrop Grumman and Caltech provided up to $17.5m for the development of innovations necessary to enable a space solar power system. Three Caltech professors head up the project: joining Hajimiri were Harry Atwater and Sergio Pellegrino. Caltech is just one institution working on developing this technology. We know that scientists at the Chongqing Collaborative Innovation Research Institute for Civil-Military Integration in China are constructing a facility to test the theoretical viability of the concept and plans to develop an orbital photovoltaic array were announced in Japan some time ago. One of the biggest issues to overcome is that of getting an array of solar panels large enough to make the project viable into orbit. Early concept designs in the 1970s featured giant arrays that would've proved very difficult to actually get into orbit. "The systems of the 70s for solar power satellites, the cost estimates suggested, at that time, that it might be as much as a trillion dollars to get to the first kilowatt hour because of the way the designs worked. Essentially a single satellite, a platform, an integrated, monolithic platform about the size of Manhattan," said Mankins. However, with SpaceX and Blue Origin slowly driving the cost of orbital delivery down, suddenly the concept seems a little closer to reality. "Going to modular systems to allow mass production, I believe was the answer to how to get solar power satellite costs down to something more reasonable," said Mankins. Proposed space solar array SPS-ALPHA, image and concept courtesy John C. Mankins. Proposed space solar array SPS-ALPHA, image and concept courtesy John C. Mankins. JOHN C. MANKINS Details of China's proposed plans have not been made public, but most concept designs that exist today are based around an idea that the photovoltaic array is composed of a lightweight, deployable structure made of many smaller "solar satellites" that could easily connect together in space to form much larger array and "harvest sunlight." Equally, this approach also makes assembly, maintenance and repair considerably easier. "I've seen a presentation on what they [China] are presumably doing. I can't guarantee that's actually it, but it was by them, about the space solar system. What I've seen appears to be a conventional approach, which is similar to what people are currently contemplating," said Hajimiri. This completed array would orbit about 22,000 miles above the Earth and "beam" the energy back down to the surface. The photovoltaic array converts the sunlight into electricity, which in turn is converted into RF electrical power (microwaves) that are beamed wirelessly to ground-based receivers. These would take the form of giant wire nets measuring up to four miles across that could be installed across deserts or farmland or even over lakes. A solar facility like this could generate a constant flow of 2,000 gigawatts of power, Mankins estimates, compared to the largest solar farm that exists today in Aswan, southern Egypt, that only generates in the region of 1.8 gigawatts. It's unlikely the solar array could be weaponized into a "death ray" like the one seen in Diamonds... [+] Are Forever. It's unlikely the solar array could be weaponized into a "death ray" like the one seen in Diamonds... [+] MGM/UNITED ARTISTS An orbiting solar array, collecting and storing massive amounts of energy that's beamed to the surface... You'd be forgiven for thinking this could be the plot of a James Bond movie, if this array was somehow weaponized. Thankfully, that's not how it works. "The energy densities will not exceed what you normally would get. It would definitely not exceed what you get from the sun," said Hajimiri. The microwaves that transmit the energy to the surface would be at the so-called non-ionizing radiation frequency. "What that means is that the frequencies are such that unlike x-rays, these are the frequencies at which their photons don't have enough energy to induce chemical change, like that ultraviolet or x-rays do," said Hajimiri. "I've been working on wireless power transmitters that would operate in the microwave frequency range, between about 2 gigahertz and 8 gigahertz, roughly. Wavelengths on the order of 10 to 2 inches. Those wavelengths of electromagnetic radiation can pass through the Earth's atmosphere, including clouds and weather, without interruption, without interference." However, Mankins expects there might still be some problems. "There's always the geopolitics issue. Because when you're at an equatorial orbit, geostationary Earth orbit, you can see a great deal of the Earth below you. For me, it's challenging to envision how there would ever be agreement to allow such a thing." The team at Caltech have successfully tested their proof of concept on the ground, their photovoltaic prototypes demonstrated they can collect and wirelessly transmit 10 gigahertz of power, so the next step is to perform scaled down experiments in space. The biggest challenge is to reduce the mass as much as possible without sacrificing efficiency. Of course, that would also help reduce cost, which is probably still the biggest hurdle. "Hopefully, we'll be able to test it in space within a couple of years," said Hajimiri. "Space solar power would transform our future in space and could provide a new source of virtually limitless and sustainable energy to markets across the world," said Mankins. "Why wouldn't we pursue it?"

#### Space renewable shift is inevitable and good – squo energy habits are unsustainable, only space-solar energy solves

Crawford 10/5 (Mark Crawford is an engineering and technology writer in Corrales, N.M. Space-Based Solar Power Offers Out-of-This World Challenges Oct 5, 2021, ASME, <https://www.asme.org/topics-resources/content/space-based-solar-power-offers-out-of-this-world-challenges)//ww> pbj

Fossil fuels comprise over three-quarters of the world’s energy consumption. These dwindling resources can only support our transportation and energy needs for another 50 to 100 years. In addition, the energy sector is the world’s greatest polluter, releasing nearly one-third of global greenhouse gas emissions, according to the Center for Climate and Energy Solutions. Depletion of oil, gas, and coal reserves will eventually force the world to shift to clean, renewable resources, especially solar energy, which is plentiful. However, solar panels have a maximum efficiency of about 22 percent and are further impacted by external factors, such as limited daylight hours or bad weather. During winter in Europe, for example, as little as three percent of sunlight reaches the earth. These limitations on solar efficiency would be removed by using satellites to collect solar energy in space and beam it to collection sites on Earth. Space-based solar panels can generate 2,000 GW of power constantly, or about 40 times more energy than a solar panel would generate on Earth, according to the National Space Society. More for You: Infographic: Floating Solar Rides the Waves To make space-based solar power (SBSP) feasible on a global scale, several main systems are required: Low-cost, reusable launch vehicles to get materials into space Very large, lightweight, advanced satellite solar panels for in-orbit construction Microwave-transmitting satellites and laser-transmitting satellites, equipped with solar collectors, reflectors, and transmitters Receiving centers built on Earth to receive and distribute this energy. “There are many technical challenges to overcome to ensure that these systems are practical and affordable such as safety, cost, and durability,” states Karen L. Jones, senior project leader and technology strategist with the Center for Space Policy and Strategy. “For example, when beaming power down to Earth, the power densities of microwave beams must be low enough to avoid any real or perceived health and safety concerns.” Other challenges include figuring out how to launch such large solar collection systems into orbit in an affordable way. Solar panels on the International Space Station cover about 2,500 square meters; SBSP solar reflectors could stretch to three kilometers. Space-based solar energy innovators and operators will also need to design their systems to withstand the harsh space environment and offer reliable energy. Key mechanical engineering challenges include robotics and on-orbit assembly and modularity. “Modularity will be essential for assembling lightweight structures that are large enough to capture solar rays in a heliostat reflector array,” said Jones. “These building blocks must be both interoperable and have some level of autonomy. So we need standards in key areas that enable on-orbit assembly, for example, mechanical, electrical, power, thermal, and data interfaces. ASME has been a key player in standards development and should consider a role in standards development as space-based solar power continues to mature.” The U.S. Naval Research Laboratory launched an orbital SPS experiment on the X-37B space plane in May 2020 to test the viability of space-based solar power systems, including converting sunlight to microwaves and analyzing the antenna’s energy conversion process and resulting thermal performance. The U.S. Air Force Laboratory has partnered with Northrop Grumman and others to develop advanced SBSP technologies. For example, the University of Toledo is developing photovoltaic energy sheets that would harvest solar energy and transmit the power wirelessly to Earth. These flexible solar cell sheets would be assembled and interconnected into much larger structures that could include tens of millions of sheets and extend to sizes as large as a square mile. China also plans to use a new super heavy-lift rocket to construct a large space-based solar gigawatt-level power station by 2050. One way to create such a large system is by launching tens of thousands of “solar satellites” covered with photovoltaic panels that are programmed to connect in space to form an enormous cone-shaped collection and transmission system. The solar energy would be beamed wirelessly to ground-based receivers of large wire nets measuring up to four miles across. Researchers at the Japan Aerospace Exploration Agency continue to work on using microwaves to transmit energy, based on their successful experiments in 2015 that successfully used microwaves to transmit electric power. The team was able to deliver 1.8 kW of power through the air with pinpoint accuracy to a receiver about 170 feet away, proving that the technology is viable. The target market for space-based solar power, at least in its early operational stages, could be discrete applications rather than broad commercial opportunities with utility-scale terrestrial facilities that supply power grids. Jones, who recently wrote Space-Based Solar Power: A Near Term Investment Decision wrote with co-author James Vedda, notes that emerging markets for space-based solar power could include on-demand power-beaming for for forward-deployed military bases. "These bases have relied on very dangerous caravans to deliver fuel to the troops," she said. "Nearly two-thirds of coaltion deaths in Iraq and Afghanistan were related to fuel-transporation activities." Similar opportunities may include other terrestrial applications where agile and on-deman beaming capabilities are needed for disaster zones and other types of remote and isolated communities, and powering untethered remote assets such as drones and distributed infrastructure and Internet of Things devices. "Regardless of how we envision the future," said Jones, "there will be surprises regarding future applications for wireless power transmission."

**Warming causes extinction & turns every impact – no adaptation & each degree is worse**

**Krosofsky ’21** [Andrew, Green Matters Journalist, “How Global Warming May Eventually Lead to Global Extinction”, Green Matters, 03-11-2021, https://www.greenmatters.com/p/will-global-warming-cause-extinction]//pranav

Eventually, yes. **Global warming will invariably result in the mass extinction of millions of different species,** humankind included. In fact, **the Center for Biological Diversity says that global warming is currently the greatest threat to life on this planet**. **Global warming causes a number of detrimental effects on the environment that many species won’t be able to handle long-term**. Extreme weather patterns are shifting climates across the globe, eliminating habitats and altering the landscape. **As a result, food and fresh water sources are being drastically reduced**. Then, of course, **there are the rising global temperatures themselves, which many species are physically unable to contend with**. Formerly frozen arctic and antarctic regions are melting, increasing sea levels and temperatures. Eventually, **these effects will create a perfect storm of extinction conditions**. The melting glaciers of the arctic and the searing, **unmanageable heat indexes being seen along the Equator are just the tip of the iceberg, so to speak.** **The species that live in these climate zones have already been affected by the changes caused by global warming.** Take polar bears for example, whose habitats and food sources have been so greatly diminished that they have been forced to range further and further south. **Increased carbon dioxide levels in the atmosphere and oceans have already led to ocean acidification**. **This has caused many species of crustaceans to either adapt or perish and has led to the mass bleaching of more than 50 percent of Australia’s Great Barrier Reef**, according to National Geographic. According to the Center for Biological Diversity, the current trajectory of global warming predicts that more than 30 percent of Earth’s plant and animal species will face extinction by 2050. By the end of the century, that number could be as high as 70 percent. We won’t try and sugarcoat things, humanity’s own prospects aren’t looking that great either. According to The Conversation, **our species has just under a decade left to get our CO₂ emissions under control. If we don’t cut those emissions by half before 2030, temperatures will rise to potentially catastrophic levels. It may only seem like a degree or so, but the worldwide ramifications are immense.** The human species is resilient. We will survive for a while longer, even if these grim global warming predictions come to pass, **but it will mean less food, less water, and increased hardship across the world — especially in low-income areas and developing countries. This increase will also mean more pandemics, devastating storms, and uncontrollable wildfires**.

## 1

#### Lockheed Martin’s making next gen space based ISR that unites the armed forces and replaces tactical surveillance platforms

Erwin ’21 [Sandra, covered the military, the Pentagon, Congress and the defense industry for nearly two decades as editor of NDIA’s National Defense Magazine and Pentagon correspondent for Real Clear Defense, “Lockheed Martin pitching mid-size satellite bus to DoD for remote sensing”, 04-13-2021, https://spacenews.com/lockheed-martin-pitching-mid-size-satellite-bus-to-dod-for-remote-sensing/]//pranav

WASHINGTON — Lockheed Martin announced a new line of satellites designed for space-based surveillance. The mid-size satellite bus is aimed at the military market and would be interoperable with military weapons systems such as fighter jets and air defense systems.

The company is pitching the new mid-size satellite as an alternative to tactical surveillance platforms like airplanes and drones. Lockheed Martin’s “tactical intelligence, surveillance and reconnaissance” satellites would give the military a capability to track moving targets from space without having to put people at risk, the company said April 13 in a news release.

A spokesman said Lockheed Martin believes the military can benefit from the lower cost of building and launching satellites, which makes space-based surveillance more affordable. For example, the Army could use satellites to locate targets and images of those targets could be downlinked to commanders on the ground. The Air Force could task satellites to track an area and pass the images directly into the cockpit of an F-35 fighter.

The company said the satellite is based on the LM400 bus — about the size of a small refrigerator — and was intentionally designed to be compliant with open standards used by DoD to connect different platforms so they can share data across land, air, maritime and space domains.

Lockheed Martin sees tactical ISR satellites as playing a central role in the Pentagon’s efforts to connect weapons systems from all military services, an initiative known as “joint all-domain command and control.”

The company said the satellites could be made with remote sensing payloads — such as visual imaging or infrared cameras, or radio-frequency trackers — supplied by DoD or by other vendors.

Rick Ambrose, executive vice president of Lockheed Martin Space, said the ISR satellites can be mass produced at the company’s Gateway Center, a new 3.5 million square-foot satellite development and manufacturing facility in Denver, Colorado.

#### Revisionist powers are reviving polar great power competition in the Arctic which upsets American unipolarity, but space strength in the region checks back

Stokes ’21 [Nathan B., Space Operations Officer United States Navy, “A COOPERATIVE SPACE STRATEGY FOR THE ARCTIC: POLICY, STRATEGY AND OPERATIONAL ASPECTS OF POLAR GREAT POWER COMPETITION”, June 2021, https://apps.dtic.mil/sti/pdfs/AD1151160.pdf]//pranav

The renewal of polar great power competition with the changing Arctic geopolitical and security environment is once again concentrating U.S. national security interests on a region traditionally viewed as an area of cooperation and low-tension. Professor AnneMarie Brady, a Chinese politics, polar politics, and foreign policy expert from the University of Canterbury in New Zealand, characterized polar great powers, in her book China as a Polar Great Power, as “states that exhibit ‘global structural power,’ or the ability to shape governance frameworks in the economic, military, and political-diplomatic sectors.”83 She goes on to state that, “to be considered a polar great power, a state must have high levels of polar scientific capacity and scientific research funding; a significant level of presence in the [Arctic]; and significant economic, military, political, and diplomatic capacity there; as well as a high level of international engagement in polar governance.”84 The emerging political and geostrategic threat to U.S. interests in the Arctic by an expanding and modernized Russian military presence and rising Chinese economic and scientific influence is seeing the Arctic region become a geostrategic flash point for future polar great power competition, where Russia, China, and the United States vie for political and geostrategic influence in a region that has the potential to alter the rules-based international order. A revisionist Russia with a resurgent Arctic presence presents a dynamic security challenge across multiple Geographic Combatant Commands (GCC) that is complex, alldomain, and multi-functional.85 The 2019 DOD Arctic Strategy notes that, “Russia views itself as a polar great power and is the largest Arctic nation by landmass, population, and military presence above the Arctic Circle.”86 The Russian Arctic coastline accounts for approximately 53 percent of the Arctic Ocean coastline, and Russia’s Arctic population of approximately two million people accounts for about half of the population living in the Arctic worldwide. Additionally, among the five Arctic littoral states of Canada, Denmark, Norway, Russia, and the United States, Russia possesses more than half of all the Arctic’s estimated oil and gas resources.87 Recent Russian military reinvestment in the region has witnessed Russian heavy bombers conducting regular air patrols along the coastlines of countries within the region, and U.S. fighter aircraft routinely intercepting Russian military aircraft inside U.S. and Canadian Air Defense Identification Zones. Advanced air and sea-launched long-range precision-strike cruise missiles are being deployed within the region allowing greater standoff ranges well outside of U.S. radar coverage. Additionally, Russia has deployed the Severodvinsk-class guided missile submarine within the region, armed with low radar cross section land-attack cruise missiles.88 These military capabilities are reinforced by Russia “refurbishing Cold War-era bases, setting up new units, opening ports and runways, and deploying radar and air-defense systems. In all, Russia has built 475 military facilities in the Arctic over the past six years [since 2019].”89 Additionally, Russia is aggressively challenging Arctic maritime security through the enforcement of aggressive economic coercion along the NSR counter to international laws. These advances in its Arctic military defense significantly increase Russia’s ability to defend and control a large stretch of the NSR and have the potential for Russia to claim an expanded EEZ that will disrupt the regional balance of power and international economic system.90

A rising China in the region is both an opportunity and challenge for the United States and its partners within the Arctic. In a January 2018 white paper titled “China’s Arctic Policy,” China declared itself a “near-Arctic state” and presented its “Polar Silk Road” economic plan to facilitate economic and social development of the Arctic. The plan emphasized China’s strategic interests within the Arctic and proposed a comprehensive strategy “to understand, protect, develop, and participate in the governance of the Arctic.”91 Although China is not an Arctic state, China was granted Arctic “observer status” within the Arctic Council in 2013.92 As an observerstate, China agreed to recognize the eight Arctic states’ sovereignty, sovereign rights, and jurisdiction in the Arctic.

However, China has also identified the Arctic as an area of “undetermined sovereignty” in which it can assert its political and economic power to influence the regional governance structure. Chinese economic, military, political, and diplomatic influence within the Arctic region provides China strategic access to transpolar shipping routes between Asia and Europe that reduce China’s dependence on southern sea routes that transit regions of U.S. influence and maritime control. China’s geostrategic priorities within the Arctic are focused on security, economic resources, and strategic science.93 In regard to space above the Arctic, Chinese space-related Arctic research focuses on research and development in the earth’s magnetic field, the aurora, all domain awareness, strategic early warning, and space situational awareness (SSA) capabilities to extend China’s operational reach.94 Space analysts have noted that China may seek to improve its SSA capabilities to better identify on-orbit targets and provide accurate engagement criteria to support space defense and counter-orbiting systems.95 China’s President Xi Jinping clarified Chinese interest in the Arctic contending that, “Polar affairs have a unique role in our marine development strategy, and the process of becoming a polar power is an important component of China’s process to become maritime great power.”96 Chinese polar interests are further illustrated in China’s vertical world map that places China at the center of the world with the polar regions dominating to the north and south. The Chinese world view sees itself visually dominating the Asia-Pacific, while sidelining the U.S., and dwarfing the importance of Europe.97 Additionally, in 2015, “the Chinese government announced that the polar regions, the deep seabed, and outer space are China’s ‘new strategic frontiers’ (zhanlüe xin jiangu), strategically important areas from which China will draw the resources needed to become a global power.”98 This increased Chinese interest in the Arctic has witnessed China investing more money in capacity than any other nation within the Arctic region,99 with significant economic investments in Canada, Denmark via Greenland, Iceland, and Norway, and significant investments in Russia’s Arctic oil and gas industry, ports, and infrastructure such as hotels.

As the global balance of power shifts from the unipolarity of U.S. dominance to a multipolar world with great power competition amongst Russia, China, and the United States, American Arctic influence is viewed to be declining as China is increasingly challenging U.S. hegemony across the globe.100 A recent poll by the European Council on Foreign Relations estimated that approximately 52 percent of Swedish respondents and 48 percent of Danish respondents thought in ten years’ time, China would be a stronger power than the United States compared to 29 and 34 percent respectively who thought the United States would maintain its advantage. Moreover, key European allies Great Britain, Germany, and France had even higher percentages of their populations that believed China would overtake the United States with 58, 56, and 62 percent compared to 19, 24, and 18 percent respectively that believed the United States would maintain its advantage.101 This eroding perception of U.S. prestige amongst key European allies and partners must be addressed by the U.S. if it seeks to maintain its regional dominance in Arctic affairs.

#### Squo space capabilities are insufficient, but new commercial defense programs that augment and compliment U.S. capabilities build coalition resiliency which counters Sino-Russo rise in the Arctic.

Stokes ’21 [Nathan B., Space Operations Officer United States Navy, “A COOPERATIVE SPACE STRATEGY FOR THE ARCTIC: POLICY, STRATEGY AND OPERATIONAL ASPECTS OF POLAR GREAT POWER COMPETITION”, June 2021, https://apps.dtic.mil/sti/pdfs/AD1151160.pdf]//pranav

The shared imperative and responsibility for space security within the Arctic transcends the capabilities of individual nations, due to limited budgets and competing global requirements. As the most advanced spacefaring nation within the Arctic, the United States will pay disproportionally in providing space operations and associated capabilities to provide increased communications, navigation, and awareness of the Arctic. However, assisting “allies and partners in developing, acquiring, and employing their own space capabilities that complement and augment U.S. capabilities and contribute to coalition space operations”119 can advance U.S. national security interests and build coalition resiliency in the Arctic. In line with the Obama administration’s space policy objectives, and as an evolutionary shift in strategic thinking, U.S. space policy now seeks to increase “allied and partner access to and sharing of national security-related space technologies, information, and equipment required to support cooperative activities when advantageous to U.S. national security interests.”120 This shift in strategic engagement should help build space capacity and capability and expand collective security by enhancing communication, navigation, and awareness within the Arctic if advantageous to their domestic strategic objectives. The realization of the potentiality of collective space security through shared multidomain awareness and an extended communications architecture also demands new approaches to public-private partnerships in the space domain. A 2019 intelligence community threat assessment stated, “We continue to assess that the expansion of the global space industry will further extend space-enabled capabilities and space situational awareness to government, nonstate, and commercial actors in the next several years. All actors will increasingly have access to space-derived information services, such as imagery; weather; communications; and positioning, navigation, and timing (PNT).”121 A collaborative space concept sees this as an opportunity to support and facilitate civil, commercial, defense, and multinational partners and leverage their shared resources and broader situational awareness to enhance Arctic regional security.122 In August 2020, James DeHart, the U.S. Coordinator for the Arctic, stated, “if you look at what is happening in our system over the last couple of months, you will see that we are launching a comprehensive and an integrated diplomatic approach and engagement in the Arctic region,” and that “in a few years, people will look back at this summer [of 2020] and see it as an important pivot point, a turning point, with a more sustained and enduring attention by the United States to the Arctic region.”123 However, although the current geostrategic environment has refocused U.S. attention on the Arctic due to polar great power competition, will the United States translate this to the space domain? For this to occur, the United States must turn intent into action and rhetoric into reality.

#### Arctic war causes WWIII and goes nuclear – causes extinction

Klare ’20 [Michael, The Nation’s defense correspondent, is professor emeritus of peace and world-security studies at Hampshire College and senior visiting fellow at the Arms Control Association in Washington, D.C., “A World War Could Break Out in the Arctic”, 02-11-2020, https://www.thenation.com/article/world/nato-russia-norway/]//pranav

For the soldiers participating in the exercise, the potentially thermonuclear dimensions of Cold Response 2020 may not be obvious. At its start, Marines from the United States and the United Kingdom will practice massive amphibious landings along Norway’s coastline, much as they do in similar exercises elsewhere in the world. Once ashore, however, the scenario becomes ever more distinctive. After collecting tanks and other heavy weaponry “prepositioned” in caves in Norway’s interior, the Marines will proceed toward the country’s far-northern Finnmark region to help Norwegian forces stave off Russian forces supposedly pouring across the border. From then on, the two sides will engage in—to use current Pentagon terminology—high-intensity combat operations under Arctic conditions (a type of warfare not seen on such a scale since World War II). And that’s just the beginning. Unbeknownst to most Americans, the Finnmark region of Norway and adjacent Russian territory have become one of the most likely battlegrounds for the first use of nuclear weapons in any future NATO-Russian conflict. Because Moscow has concentrated a significant part of its nuclear retaliatory capability on the Kola Peninsula, a remote stretch of land abutting northern Norway—any US-NATO success in actual combat with Russian forces near that territory would endanger a significant part of Russia’s nuclear arsenal and so might precipitate the early use of such munitions. Even a simulated victory—the predictable result of Cold Response 2020—will undoubtedly set Russia’s nuclear controllers on edge. To appreciate just how risky any NATO-Russian clash in Norway’s far north would be, consider the region’s geography and the strategic factors that have led Russia to concentrate so much military power there. And all of this, by the way, will be playing out in the context of another existential danger: climate change. The melting of the Arctic ice cap and the accelerated exploitation of Arctic resources are lending this area ever greater strategic significance. ENERGY EXTRACTION IN THE FAR NORTH Look at any map of Europe and you’ll note that Scandinavia widens as it heads southward into the most heavily populated parts of Denmark, Finland, Norway, and Sweden. As you head north, however, it narrows and becomes ever less populated. At its extreme northern reaches, only a thin band of Norway juts east to touch Russia’s Kola Peninsula. To the north, the Barents Sea, an offshoot of the Arctic Ocean, bounds them both. This remote region—approximately 800 miles from Oslo and 900 miles from Moscow—has, in recent years, become a vortex of economic and military activity. Once prized as a source of vital minerals, especially nickel, iron ore, and phosphates, this remote area is now the center of extensive oil and natural gas extraction. With temperatures rising in the Arctic twice as fast as anywhere else on the planet and sea ice retreating ever farther north every year, offshore fossil-fuel exploration has become increasingly viable. As a result, large reserves of oil and natural gas—the very fuels whose combustion is responsible for those rising temperatures—have been discovered beneath the Barents Sea and both countries are seeking to exploit those deposits. Norway has taken the lead, establishing at Hammerfest in Finnmark the world’s first plant above the Arctic Circle to export liquified natural gas. In a similar fashion, Russia has initiated efforts to exploit the mammoth Shtokman gas field in its sector of the Barents Sea, though it has yet to bring such plans to fruition. For Russia, even more significant oil and gas prospects lie further east in the Kara and Pechora Seas and on the Yamal Peninsula, a slender extension of Siberia. Its energy companies have, in fact, already begun producing oil at the Prirazlomnoye field in the Pechora Sea and the Novoportovskoye field on that peninsula (and natural gas there as well). Such fields hold great promise for Russia, which exhibits all the characteristics of a petro-state, but there’s one huge problem: The only practical way to get that output to market is via specially designed icebreaker-tankers sent through the Barents Sea past northern Norway. The exploitation of Arctic oil and gas resources and their transport to markets in Europe and Asia has become a major economic priority for Moscow as its hydrocarbon reserves below the Arctic Circle begin to dry up. Despite calls at home for greater economic diversity, President Vladimir Putin’s regime continues to insist on the centrality of hydrocarbon production to the country’s economic future. In that context, production in the Arctic has become an essential national objective, which, in turn, requires assured access to the Atlantic Ocean via the Barents Sea and Norway’s offshore waters. Think of that waterway as vital to Russia’s energy economy in the way the Strait of Hormuz, connecting the Persian Gulf to the Indian Ocean, is to the Saudis and other regional fossil-fuel producers. THE MILITARY DIMENSION No less than Russia’s giant energy firms, its navy must be able to enter the Atlantic via the Barents Sea and northern Norway. Aside from its Baltic and Black Sea ports, accessible to the Atlantic only via passageways easily obstructed by NATO, the sole Russian harbor with unfettered access to the Atlantic Ocean is at Murmansk on the Kola Peninsula. Not surprisingly then, that port is also the headquarters for Russia’s Northern Fleet—its most powerful—and the site of numerous air, infantry, missile, and radar bases along with naval shipyards and nuclear reactors. In other words, it’s among the most sensitive military regions in Russia today. Given all this, President Putin has substantially rebuilt that very fleet, which fell into disrepair after the collapse of the Soviet Union, equipping it with some of the country’s most advanced warships. In 2018, according to The Military Balance, a publication of the International Institute for Strategic Studies, it already possessed the largest number of modern cruisers and destroyers (10) of any Russian fleet, along with 22 attack submarines and numerous support vessels. Also in the Murmansk area are dozens of advanced MiG fighter planes and a wide assortment of anti-aircraft defense systems. Finally, as 2019 ended, Russian military officials indicated for the first time that they had deployed to the Arctic the Kinzhal air-launched ballistic missile, a weapon capable of hypersonic velocities (more than five times the speed of sound), again presumably to a base in the Murmansk region just 125 miles from Norway’s Finnmark, the site of the upcoming NATO exercise. More significant yet is the way Moscow has been strengthening its nuclear forces in the region. Like the United States, Russia maintains a “triad” of nuclear delivery systems, including intercontinental ballistic missiles (ICBMs), long-range “heavy” bombers, and submarine-launched ballistic missiles (SLBMs). Under the terms of the New Strategic Arms Reduction Treaty (New START), signed by the two countries in 2010, the Russians can deploy no more than 700 delivery systems capable of carrying no more than 1,550 warheads. (That pact will, however, expire in February 2021 unless the two sides agree to an extension, which appears increasingly unlikely in the age of Trump.) According to the Arms Control Association, the Russians are currently believed to be deploying the warheads they are allowed under New START on 66 heavy bombers, 286 ICBMs, and 12 submarines with 160 SLBMs. Eight of those nuclear-armed subs are, in fact, assigned to the Northern Fleet, which means about 110 missiles with as many as 500 warheads—the exact numbers remain shrouded in secrecy—are deployed in the Murmansk area. For Russian nuclear strategists, such nuclear-armed submarines are considered the most “survivable” of the country’s retaliatory systems. In the event of a nuclear exchange with the United States, the country’s heavy bombers and ICBMs could prove relatively vulnerable to pre-emptive strikes as their locations are known and can be targeted by American bombs and missiles with near-pinpoint accuracy. Those subs, however, can leave Murmansk and disappear into the wide Atlantic Ocean at the onset of any crisis and so presumably remain hidden from US spying eyes. To do so, however, requires that they pass through the Barents Sea, avoiding the NATO forces lurking nearby. For Moscow, in other words, the very possibility of deterring a US nuclear strike hinges on its ability to defend its naval stronghold in Murmansk, while maneuvering its submarines past Norway’s Finnmark region. No wonder, then, that this area has assumed enormous strategic importance for Russian military planners—and the upcoming Cold Response 2020 is sure to prove challenging to them. WASHINGTON’S ARCTIC BUILDUP During the Cold War era, Washington viewed the Arctic as a significant strategic arena and constructed a string of military bases across the region. Their main aim: to intercept Soviet bombers and missiles crossing the North Pole on their way to targets in North America. After the Soviet Union imploded in 1991, Washington abandoned many of those bases. Now, however, with the Pentagon once again identifying “great power competition” with Russia and China as the defining characteristic of the present strategic environment, many of those bases are being reoccupied and new ones established. Once again, the Arctic is being viewed as a potential site of conflict with Russia and, as a result, US forces are being readied for possible combat there. Secretary of State Mike Pompeo was the first official to explain this new strategic outlook at the Arctic Forum in Finland last May. In his address, a kind of “Pompeo Doctrine,” he indicated that the United States was shifting from benign neglect of the region to aggressive involvement and militarization. “We’re entering a new age of strategic engagement in the Arctic,” he insisted, “complete with new threats to the Arctic and its real estate, and to all of our interests in that region.” To better protect those interests against Russia’s military buildup there, “we are fortifying America’s security and diplomatic presence in the area…hosting military exercises, strengthening our force presence, rebuilding our icebreaker fleet, expanding Coast Guard funding, and creating a new senior military post for Arctic Affairs inside of our own military.” The Pentagon has been unwilling to provide many details, but a close reading of the military press suggests that this activity has been particularly focused on northern Norway and adjacent waters. To begin with, the Marine Corps has established a permanent presence in that country, the first time foreign forces have been stationed there since German troops occupied it during World War II. A detachment of about 330 Marines were initially deployed near the port of Trondheim in 2017, presumably to help guard nearby caves that contain hundreds of US tanks and combat vehicles. Two years later, a similarly sized group was then dispatched to the Troms region above the Arctic Circle and far closer to the Russian border. From the Russian perspective, even more threatening is the construction of a US radar station on the Norwegian island of Vardø about 40 miles from the Kola Peninsula. To be operated in conjunction with the Norwegian intelligence service, the focus of the facility will evidently be to snoop on those Russian missile-carrying submarines, assumedly in order to target them and take them out in the earliest stages of any conflict. That Moscow fears just such an outcome is evident from the mock attack it staged on the Vardø facility in 2018, sending 11 Su-24 supersonic bombers on a direct path toward the island. (They turned aside at the last moment.) It has also moved a surface-to-surface missile battery to a spot just 40 miles from Vardø. In addition, in August 2018, the US Navy decided to reactivate the previously decommissioned Second Fleet in the North Atlantic. “A new Second Fleet increases our strategic flexibility to respond—from the Eastern Seaboard to the Barents Sea,” said Chief of Naval Operations John Richardson at the time. As last year ended, that fleet was declared fully operational. DECIPHERING COLD RESPONSE 2020 Exercise Cold Response 2020 must be viewed in the context of all these developments. Few details about the thinking behind the upcoming war games have been made public, but it’s not hard to imagine what at least part of the scenario might be like: a US-Russian clash of some sort leading to Russian attacks aimed at seizing that radar station at Vardø and Norway’s defense headquarters at Bodø on the country’s northwestern coast. The invading troops will be slowed but not stopped by Norwegian forces (and those US Marines stationed in the area), while thousands of reinforcements from NATO bases elsewhere in Europe begin to pour in. Eventually, of course, the tide will turn and the Russians will be forced back. No matter what the official scenario is like, however, for Pentagon planners the situation will go far beyond this. Any Russian assault on critical Norwegian military facilities would presumably be preceded by intense air and missile bombardment and the forward deployment of major naval vessels. This, in turn, would prompt comparable moves by the United States and NATO, probably resulting in violent encounters and the loss of major assets on all sides. In the process, Russia’s key nuclear retaliatory forces would be at risk and quickly placed on high alert with senior officers operating in hair-trigger mode. Any misstep might then lead to what humanity has feared since August 1945: a nuclear apocalypse on Planet Earth. There is no way to know to what degree such considerations are incorporated into the classified versions of the Cold Response 2020 scenario, but it’s unlikely that they’re missing. Indeed, a 2016 version of the exercise involved the participation of three B-52 nuclear bombers from the US Strategic Air Command, indicating that the American military is keenly aware of the escalatory risks of any large-scale US-Russian encounter in the Arctic. In short, what might otherwise seem like a routine training exercise in a distant part of the world is actually part of an emerging US strategy to overpower Russia in a critical defensive zone, an approach that could easily result in nuclear war. The Russians are, of course, well aware of this and so will undoubtedly be watching Cold Response 2020 with genuine trepidation. Their fears are understandable—but we should all be concerned about a strategy that seemingly embodies such a high risk of future escalation. Ever since the Soviets acquired nuclear weapons of their own in 1949, strategists have wondered how and where an all-out nuclear war—World War III—would break out. At one time, that incendiary scenario was believed most likely to involve a clash over the divided city of Berlin or along the East-West border in Germany. After the Cold War, however, fears of such a deadly encounter evaporated and few gave much thought to such possibilities. Looking forward today, however, the prospect of a catastrophic World War III is again becoming all too imaginable and this time, it appears, an incident in the Arctic could prove the spark for Armageddon

## Case

#### ICJ rulings don’t apply to the US – means no perceptions internal link

Mulligan ’18 [Stephen, Legislative Attorney, “The United States and the “World Court””, Congressional Research Service, 10-17-2018, https://fas.org/sgp/crs/row/LSB10206.pdf]//pranav

While the United States is no longer subject to the ICJ’s broad compulsory jurisdiction, individual treaties may contain clauses that give the ICJ jurisdiction on a treaty-by-treaty basis. A 2008 study found that the United States was a party to more than 80 international agreements with ICJ clauses. This treaty-based jurisdiction is at issue in the Iran and PLO cases, but the Trump Administration’s most recent withdrawal announcement does not automatically terminate the ICJ proceedings in either case. Based on prior ICJ jurisprudence, the ICJ’s jurisdiction is determined at the time of filing, and, once established, is not terminated by withdrawal from the jurisdiction-creating instrument.

#### Russia and China say no, or the plan gets watered down.

**Bahney and Pearl 19** [Benjamin Bahney and Jonathan Pearl, 3-26-2019, "Why Creating a Space Force Changes Nothing," BENJAMIN BAHNEY and JONATHAN PEARL are Senior Fellows at the Lawrence Livermore National Laboratory’s Center for Global Security Research and contributing authors to [Cross Domain Deterrence: Strategy in an Era of Complexity](https://archive.md/o/Hlbi1/https:/www.amazon.com/Cross-Domain-Deterrence-Strategy-Era-Complexity/dp/0190908653). Foreign Affairs, [https://www.foreignaffairs.com/articles/space/2019-03-26/why-creating-space-force-changes-nothing accessed 12/10/21](https://www.foreignaffairs.com/articles/space/2019-03-26/why-creating-space-force-changes-nothing%20accessed%2012/10/21)] Adam

As Russia and China continue to push forward, U.S. policymakers may be tempted to use treaties and diplomacy to head off their efforts entirely. This option, although alluring on paper, is simply not feasible. Existing treaties designed to limit military competition in space have had little success in actually doing so. The 1967 Outer Space Treaty bans parties from placing nuclear weapons or other weapons of mass destruction in space, on the moon, or on other celestial bodies, but it has no formal mechanism for verifying compliance, and places no restrictions on the development or deployment in space of conventional antisatellite weapons. Even if it were possible to convince Moscow and Beijing of the benefits of comprehensive space arms control, existing technology makes it extremely difficult to verify compliance with the necessary treaty provisions—and without comprehensive and reliable verification, treaties are toothless. Moreover, regulating the development and deployment of antisatellite weapons is extremely difficult, both because they include such a broad and diverse range of technologies and because many types of antisatellite weapons can be concealed or explained away as having some other use. Unsurprisingly, Russia and China’s draft Treaty on the Prevention of Placement of Weapons in Space, which they have been pushing for several years now, has an unenforceable definition of what constitutes a “weapon” and does nothing at all to address ground-based antisatellite weapons development.

### Advantage

#### International Law fails and there’s no enforcement – this indicts their ILO key warrants

Hiken 12, Associate Director Institute for Public Accuracy (The Impotence of International Law, <http://www.fpif.org/blog/the_impotence_of_international_law>)

Whenever a lawyer or historian describes how a particular action “violates international law” many people stop listening or reading further. It is a bit alienating to hear the words “this action constitutes a violation of international law” time and time again – and especially at the end of a debate when a speaker has no other arguments available. The statement is inevitably followed by: “…and it is a war crime and it denies people their human rights.” A plethora of international law violations are perpetrated by every major power in the world each day, and thus, the empty invocation of international law does nothing but reinforce our own sense of impotence and helplessness in the face of international lawlessness. The United States, alone, and on a daily basis violates every principle of international law ever envisioned: unprovoked wars of aggression; unmanned drone attacks; tortures and renditions; assassinations of our alleged “enemies”; sales of nuclear weapons; destabilization of unfriendly governments; creating the largest prison population in the world – the list is virtually endless. Obviously one would wish that there existed a body of international law that could put an end to these abuses, but such laws exist in theory, not in practice. Each time a legal scholar points out the particular treaties being ignored by the superpowers (and everyone else) the only appropriate response is “so what!” or “they always say that.” If there is no enforcement mechanism to prevent the violations, and no military force with the power to intervene on behalf of those victimized by the violations, what possible good does it do to invoke principles of “truth and justice” that border on fantasy? The assumption is that by invoking human rights principles, legal scholars hope to reinforce the importance of, and need for, such a body of law. Yet, in reality, the invocation means nothing at the present time, and goes nowhere. In the real world, it would be nice to focus on suggestions that are enforceable, and have some potential to prevent the atrocities taking place around the globe.

#### 2] Syria Thumps I-Law Compliance – one violation is enough to thump perception and legitimacy.

Roddel 21 Shannon Roddel 2-26-2021 "Syria airstrikes a grave violation of international law, expert says" <https://news.nd.edu/news/syria-airstrikes-a-grave-violation-of-international-law-expert-says/> (Assistant Director. Mendoza College of Business, Notre Dame Law School.)//Elmer

**The U**nited **S**tates **military** Thursday (Feb. 25) **carried out airstrikes** **targeting** **Iranian-backed militias in Syria** in retaliation for rocket attacks on U.S. targets in Iraq — the first military action undertaken by the Biden administration. Mary Ellen O'Connell Mary Ellen O'Connell The strikes reportedly resulted in multiple deaths — a **grave violation of international law**, according to Notre Dame Law School professor Mary Ellen O’Connell, a respected expert on international law and the use of force. “The **U**nited **N**ations **Charter** **makes** absolutely **clear** that the **use of military force on the territory of a foreign sovereign state is lawful only in response to an armed attack** on the defending state for which the target state is responsible,” O’Connell said. “**None** **of** those **elements is met in the Syria strike**. There is no right of reprisal, right to use military force for deterrence, right to attack Iran on the territory of Syria, or right to use major military force in response to the type of violence that occurred last week.

#### ILaw and UN enforcement fail – 3 warrants

Adrian Taghdiri 13 [ J.D. 2013, Boston University School of Law; B.A., International Political Economy, University of California, Berkeley, 2008. "FLAGS OF CONVENIENCE AND THE COMMERCIAL SPACE FLIGHT INDUSTRY: THE INADEQUACY OF CURRENT INTERNATIONAL LAW TO ADDRESS THE OPPORTUNE REGISTRATION OF SPACE VEHICLES IN FLAG STATES " Journal of Science & Technology Law (2013), https://www.bu.edu/jostl/files/2015/02/05TaghdiriWeb.pdf, accessed 1-5-2022]//anop

As discussed above,168 none of the international space treaties enumerate procedures for enforcement of liability or the settlement of disputes.169 Rather, Article III of the Outer Space Treaty provides for the application of international law and the U.N. Charter to settle disputes relating to international space law.170 While international law and the U.N. Charter provide a significant number of dispute settlement mechanisms for disputes related to outer space, there are several deficiencies.171 First, Article III of the Outer Space Treaty implies, yet does not impose, any form of dispute settlement.172 This “extremely indirect reference” can help potentially liable states evade responsibility because of the absence of any compulsory procedures. 173 Second, even though there are references to the U.N. Charter and the International Court of Justice, it is not likely those references will be satisfactory settlement mechanisms because there is no binding obligation to submit disputes or any “inclination on the part of space-faring States to submit to the jurisdiction of the International Court.”174 Third, the laws of customary international law and of the U.N. Charter will not be capable of addressing many of the issues that will likely face the “novel, rapidly evolving field of [space] law and activity.”175