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T-Appropriation

#### Interp: Appropriation means permanent and exclusive control over a region of space.

Trapp 13, Timothy Justin. "Taking up Space by Any Other Means: Coming to Terms with Nonappropriation Article of the Outer Space Treaty." U. Ill. L. Rev. (2013): 1681. (JD Candidate at UIUC Law School)//Re-cut by Elmer

The issues presented in relation to the nonappropriation article of the Outer Space Treaty should be clear.214 The ITU has, quite blatantly, created something akin to “property interests in outer space.”215 It allows nations to exclude others from their orbital slots, even when the nation is not currently using that slot.216 This is directly in line with at least one definition of outer-space appropriation.217

[\*\*Start Footnote 217\*\*Id. at 236 (“Appropriation of outer space, therefore, is ‘the exercise of exclusive control or exclusive use’ with a sense of permanence, which limits other nations’ access to it.”) (quoting Milton L. Smith, The Role of the ITU in the Development of Space Law, 17 ANNALS AIR & SPACE L. 157, 165 (1992)). \*\*End Footnote 217\*\*]

The ITU even allows nations with unused slots to devise them to other entities, creating a market for the property rights set up by this regulation.218 In some aspects, this seems to effect exactly what those signatory nations of the Bogotá Declaration were try3ing to accomplish, albeit through different means.219

#### Violation:

#### Takaya supercharges ---

the authors define an exclusive use of an orbit by a state40 as any use that would prevent/hinder the usage of the same orbit by any other state.

#### De facto usage of slots does not constitute appropriation

De Man 16 [Philip DE MAN obtained his PhD in international space law at the University of Leuven in 2015. He lectures on international, European and national space law and policy at the Master of Space Studies programme of the Universities of Leuven and Ghent. “Exclusive Use in an Inclusive Environment: The Meaning of the Non-Appropriation Principle for Space Resource Exploitation.” *Springer*. 2016. Hmu for a pdf from a sketch Russian site!]

The set-up of the analysis by McDougal, Lasswell and Vlasic mixes references to inclusive use with implications of exclusive appropriation, suggesting that a decision on one aspect will have unambiguous results for the other. Disregarding for a moment whether it is prudent to make such an assumption, the authors’ analysis on inclusive and exclusive use rightly starts from the perspective of claims over types of resources instead of the actual use of particular amounts thereof, as follows from the incorporation of the claim notion in the definition of both policy options. It is clear that a narrative focusing on exclusive use yet omitting the authority angle cannot usefully settle the argument of national appropriation in Article II OST , for it overlooks the obvious fact that every form of use by one state of a resource in space, whether permanent or momentary, is necessarily exclusive to all others for the duration of the use, for otherwise the freedom to use outer space could not be exercised. 108 The physical excludability of space resources, whether tangible or intangible, implies that the use of a specific segment by a certain participant at a given moment ipso facto excludes a similar activity by all other competing users over the same segment at the same time. In this regard, Metcalf rightly notes that, “[i]f any use, which for some time excludes identical use of the same segment by somebody else, amounts to appropriation, it is difficult to see how there can be any content left in the principle of freedom of use”. 109 Our interpretation of property gives solid legal footing to this intuition. 110 For, as we have seen, mere exclusion through use does not, by any means, imply the existence of property rights , and the mere use of a resource is not an unlawful activity in and of itself. Quite the opposite: it is positively protected by the freedom to use outer space. Just as the general principle on the freedom to use outer space should not be defi ned with reference to each particular segment or piece of outer space, 111 a similar interpretation of the exclusive use criterion would result in too broad a restriction of the freedom to exploit natural resources. Additionally, since every use is exclusive for its entire duration and property is defined as exclusion that is not grounded in use, the length of time of resource exploitation is defi nitively removed from the equation applied to determine the legality of an activity, whether it concerns the instantaneous exhaustion of matter or the prolonged use of immaterial orbits. Finally, it should be pointed out that, in line with the caveat on mixing property with wealth, 112 exclusivity of use should be separated from the divisibility of the benefits that follow from such use, as the fruits of exclusive use by one can obviously be shared among multiple stakeholders.

#### Vote NEG for limits and ground: the aff interpretation explodes the topic to allow any aff about things being launched into space which structurally alters the neg research burden because there’s a qualitative difference between appropriation of outer space with regards to property and to anything being up in space. That alters neg ground because it means the aff can defend trivial middle grounds that go beyond just exclusive appropriation unbalancing the topic.

#### 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 and incentivizes theory baiting

### 1NC - OFF

Runaway DA

#### Using the UN causes a runaway amendment, encouraging delay, say no, and the destruction of OST norms.

Jim Vedda, senior policy analyst, PhD in Polisci @ U of Florida, M.A. in science, technology, and public policy @ George Washington University, ’18, “The Outer Space Treaty: Assessing its Relevance at the 50-Year Mark” https://aerospace.org/sites/default/files/2018-05/OuterSpaceTreaty.pdf

Treaty Amendment. If decisionmakers conclude that the Outer Space Treaty isn’t broken but is just showing its age, targeted changes are an obvious solution—especially in the areas of orbital debris, space salvage, and resource rights, as noted earlier; however, the process of reaching consensus on changes would entail years of diplomatic effort, with no guarantee that the end result would be better than (or as good as) what exists today. The amendment process may not remain limited to the one or two issues that prompted it. The U.N. Committee on the Peaceful Uses of Outer Space has 84 member countries,11 any of which could bring up its own amendments, which could be objectionable to the major stakeholders. Several countries, including China and Russia, have proposed treaty language that would ban all weapons in space,12 a position opposed by the United States. There is a strong possibility that similar language would be submitted as an amendment if the treaty were to be opened for revision. This could bog down the process and derail prospects for achievement in the specific areas originally targeted. In May 2017, the Senate space subcommittee held a hearing on the Outer Space Treaty,13 specifically asking whether it needed amendment to remove roadblocks to space commerce. All seven witnesses—with backgrounds in law, business consulting, and space entrepreneurship—testified that there is no need to amend the treaty, and attempting to do so could leave industry worse off. They described the treaty as minimally burdensome, and emphasized that priority should be given instead to making the U.S. licensing and regulation regime for space commerce more stable, predictable, and transparent. This is not to suggest that amendments should never be attempted, but rather that the amendment process must be undertaken with eyes wide open. The Outer Space Treaty and other space agreements exist in a dynamic environment. Technology continues to advance, and the amount and type of space activity keeps changing— so treaties may need periodic updating. But at present, higher priority should be assigned to development of a well-reasoned and comprehensive national space strategy.

#### Causes space war.

Jim Vedda, senior policy analyst, PhD in Polisci @ U of Florida, M.A. in science, technology, and public policy @ George Washington University, ’18, “The Outer Space Treaty: Assessing its Relevance at the 50-Year Mark” https://aerospace.org/sites/default/files/2018-05/OuterSpaceTreaty.pdf

Treaty Withdrawal. It is difficult to identify any significant, enduring benefits to the United States from unilateral withdrawal from the Outer Space Treaty. From the commercial development perspective, this action increases risk by removing current protections without enabling commensurate benefits. If the United States tried to claim sovereignty over extraterrestrial real estate, other spacefaring nations—all of which are treaty signatories— could refuse to recognize the claim. Alternatively, there could be a domino effect as other countries withdrew and started a free for-all of sovereignty claims—precisely what the treaty was designed to prevent. If the United States issued licenses to industry to conduct space salvage without regard for the treaty’s ownership provisions, other spacefarers could object and try to stop the practice. In retaliation, they may declare U.S. space systems to be fair game for salvage, causing grave concerns for U.S. national interests. In general, withdrawal from the treaty is unlikely to improve the ability of the U.S. to deal with space debris unilaterally since the nature of the problem requires that it be addressed multilaterally. If the aim is to remove obstacles to commercial space development, withdrawal from the treaty is unlikely. It is difficult to identify any significant, enduring benefits from unilateral withdrawal from the treaty… 6 to have much (if any) positive effect. It will do nothing to overcome the technical and economic challenges of cutting-edge space business ventures; however, the negative effects could be dramatic for all sectors of space activity. The United States could be perceived—and portrayed— as a violator of established norms of behavior. Even if commercial development is the stated justification for withdrawal, many might suspect other motives. The global community might question whether the United States wanted to deploy weapons of mass destruction or other militarily aggressive systems in space, interfere with other nations’ space systems, claim sovereignty over the moon or other celestial bodies, or abdicate its obligations under other treaties, especially those related to space. This could affect a broad array of collaborative international relationships across the civil, commercial, and national security space communities. It could also undermine U.S. influence in future discussions regarding acceptable behavior in space.

### 1NC - OFF

CubeSats DA

#### CubeSats are key to space situational awareness

O’Brien 12 [Tolulope O’Brien, Naval Postgrad School. “SPACE SITUATIONAL AWARENESS CUBESAT CONCEPT OF OPERATIONS.” December 2011-12. https://calhoun.nps.edu/bitstream/handle/10945/10664/11Dec%255FO%255FBrien.pdf?sequence=1&isAllowed=y]

This thesis provides an overview of the STARE CubeSat’s concept of operations. It explores the space surveillance network as it pertains to space situational awareness and the use of STARE to support the SSN in its SSA mission. It chronicles the background, development and integration of the optical payload into Boeing’s Colony II Bus and testing of the engineering model, engineering design unit and flight unit. Software testing of the spacecraft was performed in the ground configuration to include sending commands to the spacecraft and receiving telemetry data from the payload. An excel calculator was built to enable quick reference calculations to give a rough estimate on how much data can be sent to the spacecraft and how much data can be received within a given timeframe, taking into consideration onboard storage, uplink and downlink data rates and software overhead to ensure effective links. The camera on-board the spacecraft was tested by commanding it to take pictures in the laboratory. The raw image file gave an idea what potential pictures from the 60 operational satellite might look like. Even though the concept of using CubeSats for SSA is in its infancy, the technology is very promising.

#### Chinese SSA is key to space weather forecasting

Aghajanian 12 [Liana Aghajanian, journalist, citing Dr. Rainer Schwenn, one of the developers of KuaFu; Dr. William Liu, a senior scientist at the Canadian Space Agency; the 2008 National Academy of Sciences Report; May 14, 2012. “Cloudy With a Chance of Catastrophe: Predicting the Weather in Space.” http://mentalfloss.com/article/30665/cloudy-chance-catastrophe-predicting-weather-space]

In 1859, while observing sunspots, a young astronomer named Richard Carrington recorded a geomagnetic storm so powerful, the electrical currents it sent to Earth were enough to keep the newly invented telegraph operating without a battery. Centuries later, though humans have sent robots to Mars and even strong-armed a couple engineers into walking on the moon, the science of space weather, the changing environmental conditions in near-Earth space, has largely managed to elude us. In fact even the term “space weather” is new; it wasn’t used regularly until the 1990s. Now, an international project led by China is hoping to advance the study of space weather by light-years in order to minimize the dangerous impact a storm in space might have on us fragile Earthlings. If experts are correct, there's a chance that a serious space weather threat will arrive sooner rather than later – and the risk to humans is greater than you think. Oddly, the trouble is that we’ve become too advanced. Because humans today are so dependent upon modern electrical technology, a space storm the size of the one Carrington recorded in 1859 could cause catastrophic problems if it occurred tomorrow. According to a 2008 National Academy of Sciences Report, from long-term electrical blackouts to damage to communication satellites and GPS systems (not to mention billions in financial losses), the results could be devastating worldwide. Luckily, scientists are hopeful the KuaFu project will prevent (or at least minimize the impact of) this kind of disaster. Our Eyes on the Sun, The Sun in Our Eyes Named for Kua Fu, a sun-chasing giant from a Chinese folktale whose pursuit to tame the brightest star in our solar system ended after he died of thirst, the KuaFu project will create a space weather forecasting system 1.5 million kilometers from the Earth's surface. The goal is similar to the one from the legend: to observe changes in solar-terrestrial storms, investigate flows of energy and solar material, and improve the forecasting of space weather. Not necessarily to tame the sun, but, at least, to understand it. Proposed in 2003 by scientist Chuanyi Tu from the Chinese Academy of Sciences, the project will place three separate satellites at strategic points in our solar system to observe the inner workings of space weather. China's National Space Administration along with the European and Canadian Space Agencies will work together to man them. “Being aware of the impending blindness to space weather and its effects, we consider a mission like KuaFu absolutely mandatory,” said Dr. Rainer Schwenn, one of the developers of KuaFu. “If 'space weather' keeps being considered an important science goal, then KuaFu is a real key project.” The satellites will offer an unprecedented ability to glean information about the often tumultuous relationship between the sun and Earth, by allowing scientists to observe both the star and its effects on the planet simultaneously. To now, this process has been viewable only via computer simulation. “You have to look at the two systems simultaneously [to most accurately forecast space weather]” said Dr. William Liu, a senior scientist at the Canadian Space Agency who took over as project leader when Chuanyi Tu retired two years ago. “It's a real observation; it's what's actually happening.” Space Storm Showdown: What Do We Do? So, if the power-grid frying, billion dollar damage-wreaking storm is inevitable, how much will forecasting it actually help? Lots. According to Liu, predicting space weather activity can give the operators who maneuver satellites in space the information they need to protect them and us from harm. For example: If companies know a storm is approaching, it gives them a chance to tweak their loads before their systems descend into chaos and shut off power for, say, the entire East Coast of the United States. “That's how you prevent catastrophe,” Liu explained. “You reduce the load on the parts that are more sensitive.” While the project was originally scheduled to be completed this year, Liu’s current estimates put its debut at 2016. Despite the delays, he remains optimistic it will come to fruition, pointing out that international collaborations like this one often stir up scientific and financial challenges that delay the launch process. Whether the KuaFu project will be able to predict space weather accurately all of the time is up for debate. Liu, however, is confident that, at the very least, it's a step toward that direction . “With this launch and operation, we'll make our predictions better. Whether it will be 100 percent, that will be too much to ask, but it will definitely improve our knowledge.”

#### Lack of space weather data causes infrastructure collapse and global catastrophe

Weiss 19 – Matthew Weiss, American Jewish University, and Martin Weiss, UCLA-Olive View Medical Center, “An assessment of threats to the American power grid” Energy, Sustainability and Society December 2019, 9:18, 29 May 2019, https://link.springer.com/article/10.1186/s13705-019-0199-y

Introduction In testimony before a Congressional Committee, it has been asserted that a prolonged collapse of this nation’s electrical grid—through starvation, disease, and societal collapse—could result in the death of up to 90% of the American population [1]. There is no published model disclosing how these numbers were arrived at, nor are we able to validate a primary source for this claim. Testimony given by the Chairman of the Congressional EMP Commission, while expressing similar concerns, gave no estimate of the deaths that would accrue from a prolonged nationwide grid collapse [2]. The power grid is posited to be vulnerable to geomagnetic storms generated by solar activity, electromagnetic pulses (EMP, also referred to as HEMP) produced by high altitude nuclear detonations, cyberattack, and kinetic (physical) attack. Evidence for and against the validity of each of these threats follows below. Much of the knowledge on these matters is classified. The studies for and against EMP, other than for limited testing of a few components of the infrastructure by the EMP commission, are based not on physical demonstrations but mathematical models and simulations. Moreover, the underlying physics and technology involved—the electrical engineering and materials science—is likely beyond the understanding of the reader, and certainly beyond that of these writers. With these limitations in mind, we proceed. The electrical grid Geomagnetic storms are due to coronal mass ejections (CMEs)—massive eruptions of plasma expelled from the sun’s corona. Plasma is the fourth fundamental state of matter, consisting of free electrons and positively charged ions. The sun, like all stars, is plasma. The electrical grid HV (high voltage) transformers—transmitting voltages of greater than 100 kV—are what make it possible to send electricity over great distances to thousands of substations, where smaller transformers reduce the voltage. HV transformers are the weak link in the system, and the Federal Energy Regulatory Commission (FERC) has identified 30 of these as being critical. The simultaneous loss of just 9, in various combinations, could ~~cripple~~ [destroy] the network and lead to a cascading failure, resulting in a “coast-to coast blackout” [3]. If the HV transformers are irreparably damaged it is problematic whether they can be replaced. The great majority of these units are custom built. The lead time between order and delivery for a domestically manufactured HV transformer is between 12 and 24 months [4], and this is under benign, low demand conditions. The first practical application of the transformer was invented in the USA by William Stanley, but largely as a consequence of American trade policy (“It doesn’t make any difference whether a country makes potato chips or computer chips”- attributed to Michael Boskin, Chairman of President George H W Bush’s Council of Economic Advisors) [5] there is little manufacturing capability remaining in the USA. Worldwide production is less than 100 per year and serves the rapidly growing markets of China and India. Only Germany and South Korea produce for export. Ordered today, delivery of a unit from overseas (responsible for 85% of current American purchasing) would take nearly 3 years [6]. The factory price for an HV transformer can be in excess of $10 million—too expensive to maintain an inventory solely as spares for emergency replacement.

Potential mechanisms of collapse Geomagnetic storms Coronal mass ejections often occur with solar flares, but each can also take place in the absence of the other. The latter emits radiation in all bands of the electromagnetic spectrum (e.g., white light, ultraviolet light, X-rays, and gamma rays) and unlike CMEs, affect little more than radio communications. CME’s take several days to reach the Earth. The radiation generated by solar flares on the other hand arrives in 8 min. Coronal mass ejections carry an intense magnetic field. If a storm enters the earth’s magnetosphere, it causes rapid changes in the configuration of the earth’s magnetic field. Electric current is generated in the magnetosphere and ionosphere, generating electromagnetic fields at ground level. The movement of magnetic fields around a conductor, i.e., a wire or pipe, induces an electric current. The longer the wire, the greater the amplification. The current induced is akin to DC (direct current), which the electrical system poorly tolerates. Our grid is based on AC. The excess current can cause voltage collapse, or worse, cause permanent damage to large transformers. The current flowing through HV transformers during a geomagnetic disturbance can be estimated using storm simulation and transmission grid data [7]. From these results, transformer vulnerability to internal heating can be assessed. The largest recorded geomagnetic storm occurred Sept 1–2, 1859—the Carrington event, named after the English amateur astronomer, Richard Carrington. Auroras were seen as far south as the Caribbean. Campers in the Rocky Mountains were awakened shortly after midnight by “an auroral light so bright that one could easily read common print. Some of the party insisted it was daylight and began preparation for breakfast” [8]. Telegraph wires transmitted electric shocks to operators and ignited fires. In May 1921, there was another great geomagnetic disturbance (GMD), the railroad storm. The National Academy of Sciences estimates that if that storm occurred today, it could cause 1–2 trillion dollars damage and full recovery could take 4–10 years [9]. The basis for this assertion is a presentation made by J Kappenman of Metatech, the Goleta California engineering consulting firm, given as part of the NAS Space weather workshop titled “Future Solutions, Vulnerabilities and Risks”, on May 23, 2008. The simulation asserts that a 1921 intensity storm could damage or destroy over 300 transformers in the US, and leave 130 million people without power [10]. Elsewhere, Kappenman states that in a worst case situation, geomagnetic disturbances could instantly create loss of over 70% of the nation’s electrical service [11]. In March 1989, a geomagnetic storm caused collapse of the power grid in Quebec, leaving 6 million without power for 9 h. NERC (the North American Electric Reliability Council), a self-regulated trade organization formed by the electric utility industry, asserts that the blackout was not due to overheating of transformers from geomagnetically induced current, but to the near-simultaneous tripping of seven relays, and this is correct [12]. The rapid voltage collapse (within 93 s) likely prevented transformer thermal damage. The same storm, however, destroyed a major transformer at the Salem nuclear plant in New Jersey [13]. The 1989 Hydro-Quebec storm was 1/10th the intensity of the 1921 Railroad Storm [14]. A report for Lloyd’s in 2013 states a Carrington-level extreme geomagnetic storm is almost inevitable in the future. Using its own models and simulations, it puts the US population at risk at between 20 and 40 million, with the outages lasting up to 1–2 years [15]. Because of geography and ground conductivity, the risk of a transformer sustaining damage is 1000 times greater in some US counties than in others. The highest risk is to the counties along the corridor between Washington DC and New York [16]. The first written account of a solar storm is possibly in the book of Joshua. Written reports of aural sightings by Greeks and Romans begin in 371 BC. A Carrington-level storm narrowly missed the earth in 2012 [17]. NASA has produced a video on the CME [18]. Formerly considered a 1 in 100-year event, the likelihood of a Carrington intensity storm striking the earth has most recently been placed at 12% per decade [19].

Mitigation The EMP Commission, in its 2008 report, found that it is not practical to try to protect the entire electrical power system or even all high-value components. It called however for a plan designed to reduce recovery and restoration times and minimize the net impact of an event [20]. This would be accomplished by “hardening” the grid, i.e., actions to protect the nation’s electrical system from disruption and collapse, either natural or man-made [21]. The shielding is accomplished through surge arrestors and similar devices [22]. The cost to harden the grid, from our tabulation of Congressional EMP figures, is $3.8 billion. There has been no hardening of the grid The commission and organization that are responsible for public policy on grid protection are FERC and NERC. FERC (The Federal Energy Regulatory Commission) is an independent agency within the Department of Energy. NERC, the self-regulatory agency formed by the electric utility industry, was renamed the North American Electric Reliability Corporation in 2006. In June of 2007, FERC granted NERC the legal authority to enforce reliability standards for the bulk power system in the USA. FERC cannot mandate any standards. FERC only has the authority to ask NERC to propose standards for protecting the grid. NERC’s position on GMD is that the threat is exaggerated. A report by NERC in 2012 asserts that geomagnetic storms will not cause widespread destruction of transformers, but only a short-term (temporary) grid instability [23]. The NERC report did not use a model that was validated against past storms, and their work was not peer-reviewed. The NERC report has been criticized by members of the Congressional EMP commission. Dr. Peter Pry asserts that the final draft was “written in secret by a small group of NERC employees and electric utility insiders….. The report relied on meetings of industry employees in lieu of data collection or event investigation” [22]. NERC, in turn, criticizes Kappenman’s work. NERC states that the Metatech work cannot be independently confirmed [24]. NERC reliability manager Mark Lauby criticized the report for being based on proprietary code [24]. Kappenman’s report, however, received no negative comments in peer review [24]. The NERC standards The reliability standards and operational procedures established by NERC, and approved by FERC, are disputed [25]. Among the points are these: 1. The standards against GMD do not include Carrington storm class levels. The NERC standards were arrived at studying only the storms of the immediate prior 30 years, the largest of which was the Quebec storm. The GMD “benchmark event”, i.e., the strongest storm which the system is expected to withstand, is set by NERC as 8 V/km [26]. NERC asserts this figure defines the upper limit intensity of a 1 in 100-year storm [26]. The Los Alamos National Laboratory, however, puts the intensity of a Carrington-type event at a median of 13.6 V/km, ranging up to 16.6 V/km [27]. Another analysis finds the intensity of a 100-year storm could be higher than 21 V/km [28]. 2. The 15–45 min warning time of a geomagnetic storm provided by space satellites (ACE and DSCOVR) will be insufficient for operators to confer, coordinate, and execute actions to prevent grid damage and collapse. Testimony of Edison Electric Institute official Scott Aaronson under questioning by Senator Ron Johnson in a hearing before the Senate Homeland Security and Governmental Affairs Committee in 2016 encapsulates some of the issues. Video of the exchange is available on the web [29]. The Edison Electric Institute (EEI) is the trade association that represents all US investor-owned electric companies. Johnson: Mr. Aaronson, I just have to ask you – the protocol of warning 15–30 min – who is going to make that call? I mean, who is going to make that for a massive geomagnetic disturbance, that nobody knows how many of these transformers are going to be affected. Who is going to make that call to shut them off line – to take them off line – so those effects do not go through those wires and destroy those large transformers that cannot be replaced? Aaronson: So, the grid operators are tightly aligned. We talked about the fact that there are 1900 entities that make up the bulk electric system. There are transmission operators and so on… Johnson (interrupting): Who makes the call? Who makes the call – we are going to shut them all down in 30 min, in 15 min? Aaronson: It’s not as simple as cutting the power. That’s not how this is going to work but there is again, there is this shared responsibility among the sector. Johnson: Who makes the call? Aaronson: I do not know the answer to that question [29]. Mr. Aaronson’s is Managing Director for Cyber and Infrastructure Security at EEI. Congressman Trent Franks, R Az introduced HR 2417, the SHEILD Act, on 6/18/2013. The bill would give FERC the authority to require owners and operators of the bulk power system to take measures to protect the grid from GMD or EMP attack. The costs would be recovered by raising regulated rates. Franks states he had been led to believe that his bill would be brought to the House floor for a vote. But he states House Energy and Commerce Committee Chairman Fred Upton R, Mich., let it die in committee. He has been unable to get an explanation from Upton [30]. Between 2011 and 2016, Mr. Upton has received $1,180,000 in campaign contributions from the electric utility industry [31]. The electric utility industry is heavily involved in campaign donations. During the 2014 federal election cycle, the electric utility industry made $21.6 million in campaign contributions [32]. The electrical utility industry is particularly involved in state politics. For instance, in Florida, between 2004 and 2012 electric utility companies donated $18 million into legislative and state political campaigns. In that state, the electric utilities employ one lobbyist for every two legislators [33]. Electric utility revenue in 2015 was 391 billion dollars [34].

Electromagnetic pulse Of the scenarios that might lead to electrical network collapse, EMP has received the widest public attention. It has been the subject of television series, films, and novels. HEMP (for high altitude) is the more accurate acronym, but as media and the public use EMP, we will use both interchangeably. The issue has become highly politicized. The most prominent article in the media against EMP as a threat is by Patrick Disney, “The Campaign to Terrify You about EMP” published in the Atlantic in 2011. “From Newt Gingrich to a Congressional ‘EMP Caucus’, some conservatives warn the electronic frying blast could pose gravely underestimated dangers on the U.S…..Ballistic missile defense seems to be the panacea for this groups concern, though a generous dose of preemption and war on terror are often prescribed as well” [35]. As of 2009, Mr. Disney was acting Policy Director for the National Iranian American Council (NIAC). NIAC has been accused of acting as a lobby for the Islamic Republic of Iran [36]. Mr. Disney is quoted as stating his strategy, in advancing an Iranian interest, is to “create a media controversy” [36]. The campaign to discredit EMP has been largely successful. To a very large part of the body politic EMP is identified as a cause limited to the far right. A high-altitude electromagnetic pulse (EMP) is produced when a nuclear device is detonated above the atmosphere. No radiation, blast, or shock wave is felt on the ground, nor are there any adverse health effects, but electromagnetic fields reach the surface. An EMP has three components, E1 through E3, defined by speed of the pulse. Each has specific characteristics, and specific potential effects on the grid. E1, the first and fastest component, affects primarily microelectronics. E3, the later and slower component, affects devices attached to long conductive wires and cables, especially high-voltage transformers. A single nuclear blast will generate an EMP encompassing half the continental USA [37]. Two or three explosions, over different areas, would blanket the entire continental USA. The potential impact of an EMP is determined by the altitude of the nuclear detonation, the gamma yield of the device, the distance from the detonation point, the strength and direction of the earth’s magnetic field at locations within the blast zone and the vulnerability of the infrastructures exposed. The E1 gamma signal is greatest for bursts between 50 and 100 km altitude. E3 signals are optimized at busts between 130 and 500 km altitude, much greater heights than for E1 [38]. Higher altitude widens the area covered, but at the expense of field levels. The 1963 atmospheric test ban has prevented further testing. E1 and its effects The E1 pulse (“fast pulse”) is due to gamma radiation (photons), generated by a nuclear detonation at high altitude, colliding with atoms in the upper atmosphere. The collisions cause electrons to be stripped from the atoms, with the resultant flow of electrons traveling downward to earth at near the speed of light. The interaction of the electrons with the earth’s magnetic field turns the flow into a transverse current that radiates forward as an intense electromagnetic wave. The field generates extremely high voltages and current in electrical conductors that can exceed the voltage tolerance of many electronic devices. All this occurs within a few tens of nanoseconds. The Congressional EMP Commission postulated that E1 would have its primary impact on microelectronics, especially SCADAs (Supervisory Control and Data Acquisition), DCSs (digital control systems), and PLCs (programmable logic controllers). These are the small computers, numbering now in the millions, that allow for the unmanned operation of our infrastructure. To assess the vulnerability of SCADAs to EMP, and therefore the vulnerability of our infrastructure, the EMP Commission funded a series of tests, exposing SCADA components to both radiated electric fields and injected voltages on cables connected to the components. The intent was to observe the response of the equipment, when in an operational mode, to electromagnetic energy simulating an EMP. “The bottom line observation at the end of the testing was that every system tested failed when exposed to the simulated EMP environment” [6]. E1 can generate voltages of 50,000 V. Normal operating voltages of today’s miniaturized electronics tend to be only a few (3-4) volts. States the EMP Commission: “The large number and widespread reliance on such systems by all the nation’s critical infrastructures represent a systemic threat to their continued operation following an EMP event” [39]. A scenario seen in films is all automobiles and trucks being rendered inoperable. This would not be the case. Modern automobiles have as many as 100 microprocessors that control virtually all functions, but the vulnerability has been reduced by the increased application of electromagnetic compatibility standards. The EMP Commission found that only minor damage occurred at an E1 field level of 50 kV/m, but there were minor disruptions of normal operations at lower peak levels as well [40]. There is a self-published post (J. Steinberger, Nobel laureate physics, 1988) disputing the potential effects of E1 [41]. This is an isolated opinion. Shielding against E1 could theoretically be accomplished through the construction of a Faraday cage around specific components or an entire facility. The cage is composed of conductive materials and an insulation barrier that absorbs pulse energy and channels it directly into the ground. The cage shields out the EM signals by “shorting out” the electric field and reflecting it. To be an effective Faraday cage, the conductive case must totally enclose the system. Any aperture, even microscopic seams between metal plates, can compromise the protection. To be useful, however, a device must have some connection with the outside world and not be completely isolated. Surge protective devices can be used on metallic cables to prevent large currents from entering a device, or the metallic cables can be replaced by fiber optic cables without any accompanying metal. The US Military has taken extensive measures to protect (“harden”) its equipment against E1. “On the civilian side, the problem has not really been addressed” [42]. E3 and its effects E3 is caused by the motion of ionized bomb debris and atmosphere relative to the geomagnetic field, resulting in a perturbation of that field. This induces currents of thousands of amperes in long conductors such as transmission lines that are several kilometers or greater in length. Direct currents of hundreds to thousands of amperes will flow into transformers. As the length of the conductor increases, the amperage amplifies. The physics of E3 are similar to that of a GMD, but not identical. GMD comes from charged particles showering down from space creating current flow in the ionosphere. These currents create magnetic fields on the ground. A nuclear burst on the other hand generates particles which create a magnetic bubble that pushes on the earth’s magnetic field producing a changing magnetic field at the Earth’s surface. A geomagnetic storm will have substorms that can move over the Earth for more than 1 day, while the E3 HEMP occurs only immediately following a nuclear burst. There are three studies on the potential effects of a HEMP E3 on the power grid. The first study, published in 1991, found there would be little damage [43]. Although supporting the utility industry’s position, it has not been subsequently cited by either NERC or the industry. The study is criticized for expressing a smaller threat intensity [44]. The second, published in 2010 by Metatech, calculated that a nuclear detonation 170 km over the USA would collapse the entire US power grid [45]. The third study, by EPRI (an organization funded by the electric utility industry) published in February 2017, asserts that a single high-altitude burst over the continental USA would damage only a few, widely scattered transformers [46]. The study is disputed for underestimating threat levels and using erroneous models [44]. These results are incompatible. One’s interpretation of the studies on E3 (and GMD) is based largely on the credibility one gives to the underlying Commission or Institute, and not the published calculations. FERC has decided not to proceed with a GMD standard that includes EMP [47]. It will be recalled the GMD standard is 8 V/km. The EMP Commission, utilizing unclassified measured data from the Soviet era nuclear tests, found an expected peak level for E3 HEMP for a detonation over the continental USA would be 85 V/km [48]. The position of the electric utility industry is that E3 from a nuclear detonation is not a critical threat [49]. Others have come to a different conclusion. Israel has hardened her grid [50]. She perceives herself to face an existential threat, and it is not the Sun. The electric utility industry states the cost of hardening the grid against EMP is the government’s responsibility, not the industry’s [51]. Cyberattack The vulnerability from a cyberattack is exponentially magnified by our dependence on SCADAs. In 2010, a computer worm attacking SCADA systems was detected. Although widely spread, it was designed to only attack SCADA systems manufactured by Siemens for P-1 centrifuges of the Iranian nuclear enrichment program. The attack destroyed between 10 and 20% of Iranian centrifuges. Iran’s program was likely only briefly disrupted [52]. In December 2015, a cyberattack was directed against the Ukrainian power grid. It caused little damage as the grid was not fully automated. There is an argument that the cyber threat is exaggerated. Thomas Rid states that viruses and malware cannot at present collapse the electric grid. “(The world has) never seen a cyber- attack kill a single human being or destroy a building” [53]. The electric utility industry offers a similar perspective. In testimony on cybersecurity before the Senate Homeland Security and Governmental Affairs Committee, its representative states that “There are a lot of threats to the grid…..from squirrels to nation states, and frankly, there have been more blackouts as a result of squirrels (gnawing wire insulation) then there are from nation states” [54]. Others however express concern [55]. Moreover, in a report by the Department of Defense in 2017, it is noted that “the cyber threat to critical US infrastructure is outpacing efforts to reduce pervasive vulnerabilities.” [56] That report notes that “due to our extreme dependence on vulnerable information systems, the United States today lives in a virtual glass house” [57]. On March 15, 2018, the Department of Homeland Security issued an alert that the Russian government had engineered a series of cyberattacks targeting American and European nuclear power plants and water and electric systems [58]. It is reported these attacks could allow Russia to sabotage or shut down power plants at will [59]. The ability to operate a system in the absence of computer-driven actions is fast disappearing. The electric power industry spends over $1.4 billion dollars annually to replace electromechanical systems and devices that involve manual operation with new SCADA equipment [60]. With modest increases in efficiency come exponential increases in vulnerability. The extent to which reduced labor costs (and perhaps reduced energy costs) are passed on to the public is uncertain. Kinetic attack An internal FERC memo obtained by the press in March 2012 states that “destroy nine interconnector substations and a transformer manufacturer and the entire United States grid would be down for 18 months, possibly longer” [61]. The mechanism is through the megawatts of voltage that would be dumped onto other transformers, causing them to overheat and in cascading fashion cause the entire system overload and fail. At Metcalf California (outside of San Jose) on April 16, 2013, a HV Transformer owned by PG&E sustained what NERC and PG&E claimed was merely an act of vandalism [1]. Footprints suggested as many as 6 men executed the attack. They left no fingerprints, not even on the expended shell casings [1]. US FERC Chairman Wellinghoff concluded that the attack was a dry run for future operations [62]. Information on how to sabotage transformers has been available online [63]. There is a disincentive for management to invest in security. As stated in a report by the Electric Research Power Institute: “Security measures, in themselves, are cost items, with no direct monetary return. The benefits are in the avoided costs of potential attacks whose probability is generally not known. This makes cost-justification very difficult” [64]. CEO pay at large American companies is based on the Harvard Business School theory that the best measure of managerial performance is a company’s stock price. This does not necessarily align the interests of CEOs with shareholders, let alone the public. It “encourages short-term boosts to profits rather than investing for long term growth” [65]. In 2014, the CEO of PG&E, Anthony Early Jr., had a compensation of $11.6 million dollars. Over 90% was from bonuses based on stock performance. The President of PG&E, Christopher Johns, had a compensation of $6 million dollars [66]. There is no evidence, however, that any of this is in play in the positions of the electric utility industry vis-à-vis securing the grid. States PG&E spokesman Jonathan Marshall, “The majority of compensation for senior executives is shareholder funded and dependent on achieving targets related to safety, reliability and other results” [66].

Consequences of a sustained power outage The EMP Commission states “Should significant parts of the electrical power infrastructure be lost for any substantial period of time, the Commission believes that the consequences are likely to be catastrophic, and many people will die for the lack of the basic elements necessary to sustain life in dense urban and suburban communities.” [67]. Space constraints preclude discussion on how the loss of the grid would render synthesis and distribution of oil and gas inoperative. Telecommunications would collapse, as would finance and banking. Virtually all technology, infrastructure, and services require electricity. An EMP attack that collapses the electric power grid will collapse the water infrastructure—the delivery and purification of water and the removal and treatment of wastewater and sewage. Outbreaks that would result from the failure of these systems include cholera. It is problematic if fuel will be available to boil water. Lack of water will cause death in 3 to 4 days [68]. Food production would also collapse. Crops and livestock require water delivered by electronically powered pumps. Tractors, harvesters, and other farm equipment run on petroleum products supplied by an infrastructure (pumps, pipelines) that require electricity. The plants that make fertilizer, insecticides, and feed also require electricity. Gas pumps that fuel the trucks that distribute food require electricity. Food processing requires electricity. In 1900, nearly 40% of the population lived on farms. That percentage is now less than 2% [69]. It is through technology that 2% of the population can feed the other 98% [68]. The acreage under cultivation today is only 6% more than in 1900, yet productivity has increased 50 fold [69]. As stated by Dr. Lowell L Wood in Congressional testimony: “If we were no longer able to fuel our agricultural machine in the country, the food production of the country would simply stop, because we do not have the horses and mules that used to tow agricultural gear around in the 1880s and 1890s”. “So the situation would be exceedingly adverse if both electricity and the fuel that electricity moves around the country……… stayed away for a substantial period of time, we would miss the harvest, and we would starve the following winter” [70]. People can live for 1–2 months without food, but after 5 days, they have difficulty thinking and at 2 weeks they are incapacitated [68]. There is typically a 30-day perishable food supply at regional warehouses but most would be destroyed with the loss of refrigeration [69]. The EMP Commission has suggested food be stockpiled for a possible EMP event.

#### Solar flares take out the grid---extinction.

Crane 17 --- Leah Crane, citing a study by Avi Loeb of Harvard University in *The Astrophysical Journal*, ("A tech-destroying solar flare could hit Earth within 100 years," 10-16-2017, *New Scientist*, https://www.newscientist.com/article/2150350-a-tech-destroying-solar-flare-could-hit-earth-within-100-years/, accessed 7-5-2019) bm

The sun could be one of our biggest threats in the next 100 years. If an enormous solar flare like the one that hit Earth 150 years ago struck us today, it could knock out our electrical grids, satellite communications and the internet. A new study finds that such an event is likely within the next century. “The sun is usually thought of as a friend and the source of life, but it could also be the opposite,” says Avi Loeb at Harvard University. “It just depends on circumstances.” Loeb and Manasvi Lingam, also at Harvard, examined data on other sun-like stars to see how likely solar “superflares” are and how they might affect us. They found that the most extreme superflares are likely to occur on a star like our sun about every 20 million years. The worst of these energetic bursts of ultraviolet radiation and high-energy charged particles could destroy our ozone layer, cause DNA mutations and disrupt ecosystems. But in the shorter term, the researchers say that less intense superflares of a type we know can happen on our sun could still cause problems. In 1859, a powerful solar storm sent enormous flares towards Earth in the first recorded event of its kind. Telegraph systems across the Western world failed, with some reports of operators receiving shocks from the huge amounts of electrical current forced through the wires. Tech wipeout “Back then, there was not very much technology so the damage was not very significant, but if it happened in the modern world, the damage could be trillions of dollars,” says Loeb. “A flare like that today could shut down all the power grids, all the computers, all the cooling systems on nuclear reactors. A lot of things could go bad.” Loeb says an event as powerful as the 1859 one could cause about $10 trillion of damage to power grids, satellites and communications. A flare just a bit stronger could even damage the ozone layer. Previous work has shown that such an event seems likely to occur in the next century, with a 12 per cent chance of it happening in the next decade, but nobody seems to be all that worried, Loeb says. Asteroid impacts get all the attention when it comes to life-threatening space events, but Loeb and Lingam found that superflares would be just as deadly and are just as likely.

### 1NC - OFF

Cyber DA

#### Cyber attacks on critical infrastructure 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

### 1NC - OFF

Word PIC

#### CP Text: I affirm the entirety of the 1AC minus their use of the word “cowboy.”

Yellow Bird 04 [Michael Yellow Bird is a Professor of Sociology and the Director of Tribal and Indigenous Peoples Studies at North Dakota State University. He is an enrolled member of the Mandan, Hidatsa, and Arikara tribes from North Dakota. “Cowboys and Indians: Toys of Genocide, Icons of American Colonialism.” Autumn 2004. https://www.jstor.org/stable/1409497?seq=1]

TOYS OF GENOCIDE It seems I am constantly offended by the colonial representations and words used to describe (or more accurately subjugate) Indigenous Peoples in the United States. Images such as big-nosed Indian sports team mascots and words like "redskins" and "squaw" quickly come to mind. Cowboys and Indians have, for me, come to symbolize America's past and present infatuation with colonization and genocide. For the past year, I have been accepting invitations from an Indigenous colleague and her family to come to their place to visit and have dinner, go hiking, watch cult videos, celebrate birthdays and holidays, and meet relatives from out of town. The drive from my place to theirs generally takes about a half-hour when traffic is light. Dinner is always good, and visiting includes a number of interesting topics. Sometimes we discuss global or tribal politics or the environmental degradation of Mother Earth. Other times we talk about our responsibility as First Nations intellectuals and the microassaults we experience from everyday colonial society or about our teaching and research in the academy and the effects that resistant students and colleagues have on our attempts to decolonize their thinking and our academic disciplines. Inevitably, our conversation always turns to how American colonialism has damaged our reservation communities: alcoholism, poverty, poor health, internalized hatred, social factionalism, and the brain drain (the exodus of our most talented tribal members from our communities due to the lack of opportunity or challenge, being from the wrong family, or jealousy). It seems we frequently imagine how we might return home to help our people. But this dream usually ends at about 9:55 p.m. when I am saying good-bye and getting in my car to go home. One of my favorite things to do before I visit my friends is to pick up a half-gallon of gourmet ice cream, usually cookies and cream, for an after-dinner dessert. I would consider ice cream to be the only true benefit of colonialism, except many Indigenous Peoples are lactose intolerant and diabetic. I am almost always late when I arrive, but it never fails that I am met at the door by the children, who scream out my name and give me a big body or leg hug. This past Christmas my 34 3 partner and I brought gifts for the family. Neither of us celebrates this holiday so it is a challenge for us to think of ways we can counter American corporate consumerism and sweatshop imperialism. Imbued with this holiday spirit, we purchased presents from some socially responsible-looking artists in a parking lot near the organic food market where we shop. We looked at several gifts before deciding that we would get everyone a turtle pendant to wear around their neck, a symThis content downloaded from 142.103.160.110 on Sat, 17 Oct 2015 21:24:10 UTC All use subject to JSTOR Terms and Conditions bol of long life among many tribal peoples. Mom and Dad got glass turtles while the children's were carved from stone. As part of the children's gift pack, we gave them each a gender-specific toy, made by some multinational conglomerate, which sparked more excitement among them than the stone reptiles. A couple of weeks ago, on my way over for my ritual dinner and visit, I stopped to get the ice cream. Remembering the children's delight when they received their toys at Christmas, I first went in search of a present for each. I walked down the toy aisle until I found the Matchbox car section where I picked out one for each of the two boys, and then carefully sidestepped my way farther down the aisle looking for an appropriate gift for the daughter. I stopped at the bubbles section and picked out the largest bottle, which was on the highest shelf. Pleased with my selections, I turned toward the freezers of ice cream and came face-to-face with several near-identical plastic bags full of little red toy Indians and blue cowboys. I was momentarily stunned as I gazed at this nauseating display of Americana. However, a panoply of interactions between the receptors and neuropeptides in my gut and brain caused me to smile with delight because I had been talking about these little genocidal toys just a few weeks earlier with students in my Diversity and Oppression class. After explaining to them my most "neutral" scholarly disdain for these toys, I attempted to put these seemingly benign little figures into a larger cultural context that I thought might help students see more precisely what I was attempting to convey. You might call it a teaching moment. Often, I find it is effective to help students understand the oppression of Indigenous Peoples by paralleling our situation with that of other more well-known groups of color. I said, "Imagine if children could also buy bags of little toy African-American slaves and their white slave masters, or Jewish holocaust prisoners and their SS Nazi guards, or undocumented Mexicans and their INS border patrol guards." I paused a moment for greater effect. "Imagine if the African-American set included little whips and ropes so the white slave masters could flog the slaves that were lazy and lynch those who defied them. Imagine if the border guards in the Mexican toy set came with little nightsticks to beat the illegal aliens, infrared scopes on their rifles to shoot them at night, and trucks to load up those they caught." I continued, "Imagine if the Jewish and Nazi toys included little barbed-wire prison camps and toy trains to load up 35 and take the prisoners to the toy gas chambers or incinerators, batteries not included." When I finished I asked for feedback on what I thought was a most brilliant exemplar and repartee to American colonialism. To my dismay no one answered or showed any emotion. Students seemed paralyzed. I waited as they remained fixed and dilated giving me "the thousand-yard stare." Their lack of response caused me This content downloaded from 142.103.160.110 on Sat, 17 Oct 2015 21:24:10 UTC All use subject to JSTOR Terms and Conditions to wonder if it were possible to create permanent disconnect between receptors and neuropeptides in people by sharing such toxic images and words. I set down the toy cars and bubbles and grabbed one of the bags of cowboys and Indians and carefully tilted it toward me to read the front of the package. As I read, I pulled the bag from the small metal display rod so I could see what the little figures were wearing and the weapons they were brandishing: cowboy hats and fully feathered war bonnets; six-guns and rifles, bows and arrows. These guys were ready for battle. I turned over the bag, interested to read who manufactured them (Magic) and where they were made (China), since half the toys sold in the United States (about $20 billion worth in 2001) are made in China under brutal sweatshop conditions made possible by the avarice or, in economic terms, the "bottom line" of several different prominent American toy companies. As I gazed at the figures, I thought about all those young Chinese women forced to work in these American toy factories for seventeen cents an hour, sixteen hours a day, seven days a week, for months at a time; workers who spend all day in 104-degree room temperatures around machines that cause hearing loss and chemicals that make them sick and faint on the job; workers who agonizingly perform the same job operation three thousand times a day and work an overtime schedule that leaves them with as little as two or three hours of sleep per night. Workers who are worn out and used up by the time they reach age thirty to thirty-five and are quickly removed and replaced by a constant stream of younger workers.3 I wondered how many young Chinese women have died or been poisoned by breathing in the toxic chemicals in molten plastic while they poured the red liquid to make the Indians and the blue to make the cowboys; all this so American kids can practice killing Indians. I decided to buy the cowboys and Indians and take them to my class for a show-and-tell session, thinking I would let my students play with them and then discuss what malevolent tendencies came alive in their play. I also thought that discussing the connection between > these little genocidal toys and the exploitation of Chinese women by American multinational toy companies would be interesting, especial- # ly if I were able to input my theory that a reason these figures are toler- ? ated is due to the subconscious demands of white American supremacy u over Indigenous Peoples. I walked confidently to the checkout stand, 36 L but as I got closer I began to psychologically deflate, remembering that I am closely related to those little red guys in the bag while the white cashiers, despite their lack of cowboy hats, dirty faces, boots, and sixguns, are relatives of those little blue guys: the ones who killed my kind. I placed the ice cream down first and threw all the toys together hoping that the cowboys and Indians wouldn't draw too much attention from the cashier. Everything totaled twelve dollars. Twelve dollars! I uttered an inaudible ouch as the cashier cowboy quickly colonized the portion of my economic livelihood I earned through my decolonization work with non-Indigenous university students. I mistakenly pulled out a one-dollar bill from my wallet, thinking it was a twenty. The cashier stared at me as I put it back, but not before I looked at the picture of George Washington, remembering that cowboys call this guy one of the founding fathers of the United States while the Seneca called him "Caunotaucarius" (the town destroyer). I recalled a conversation with a Seneca brother who informed me that the father of this country sent American troops through his people's territory burning down villages, destroying all crops and stored foodstuffs, killing many, and leaving the rest to starve through the bitter winter. I pulled out a five and searched for another and a couple of ones with no luck. Ah yes, Abraham Lincoln, the great emancipator pictured on the five-dollar bill, "freed" black slaves and gave orders to hang thirty-eight Dakotas following the so-called Dakota Uprising in Minnesota. This hanging was called the "greatest mass execution in U.S. history," and, according to the Guinness Book of Records, lynching these Dakotas made "Old Honest Abe" the record holder for the largest hanging of people from one gallows.4 During Lincoln's presidency, the Dakota were mistreated, cheated, and abused by white settlers, Indian agents, and traders who had pushed them off their lands, leaving them only one-tenth of their original territory. They were starving because the wild game was gone from their hunting grounds, which were claimed by white settlers. They were also deceived in the treaties that they made with the United States and did not get annuities and food promised to them. When Dakota chief Little Crow requested food from Indian agent Thomas Galbraith for his starving people, he was condescendingly told by trader Andrew Myrick that they should "eat grass or their own dung."5 I put back the five and finally pulled out a twenty and gave it to the cashier who put it in the register while she counted my change. As I waited, I remembered that Andrew Jackson, the brave Indian fighter on the twenty-dollar bill, was called the "devil" by the Creek Nation because of his wanton slaughter of unarmed Creeks. "At the Battle of Horse Shoe Bend, Jackson and his troops surrounded eight hundred Creeks and killed almost all of them, including women and children. Afterward his soldiers made bridle reins of skins taken from the corpses; they also cut off the tip of each dead Indian's nose for a body count."6 37 Jackson was also responsible for illegally driving the Cherokees off their homelands in Georgia and force-marching them to Oklahoma, but not before five to eight thousand (mostly elders, children, and women) died on the "trail of tears." As I collect my change, it occurs to me that I got rid of the Cherokee/Creek killer, but now have three more town destroyers and one more Dakota executioner. This content downloaded from 142.103.160.110 on Sat, 17 Oct 2015 21:24:10 UTC All use subject to JSTOR Terms and Conditions I finally arrived at the home of my friends and received the customary affectionate hugs and greetings from all. I handed over the ice cream to the parents to be refrigerated and dug the toys out of the bag to hand out to the kids. Forgetting the cowboys and Indians were in the bag, I took them out at the same time as the other toys. The youngest, responding like other young feral boys his age, immediately yelled "these are mine," snatched them out of my hand before his brother and sister could react, and dove toward a corner protecting his cache while we all looked on. I quickly responded, saying, "Oh, those little toys are for my students; I have another really nice toy for you." However, when he saw that the car I was holding was much smaller, he hunkered down on his prize and cried "no, no, no" as his mother attempted to extricate the bag from his little, powerful, white-knuckled clutch. As he and his mother wrestled for supremacy over the toys, I quickly intervened saying, "It's OK, you can have them ... he can have them," which brought some relief for all. When calm returned, I explained to mom and dad that I would never buy cowboys and Indians for myself and that these little guys were for a multifaceted split-plot factorial experiment hypothesizing the post hoc basal levels of aggression and hypo-organic racism elicited from my students following their play with these little guys. Even though I said this with a straight face, both mom and dad said, "Oh yeah, sure you were; we know you were taking them home so you could have those little Indians torture those poor little cowboys." Later in the evening, when visiting between us adults waned, the two boys brought me their large sky blue Tupperware container of toys and asked me to play with them. I agreed, and we sat at the dining table looking at all the different little cars, trucks, and animal figures. I cringed as I observed that they had already added the cowboys and Indians to their collection. I began to pray silently that we wouldn't play with these guys because I knew I would want the Indians to kill all the cowboys, and it wouldn't be pretty. As the boys looked over the toys, I sent them powerful silent thoughts intended to discourage them from wanting to play with these little figures. My telekinetic abilities failed, and the boys took them out and separated them into what seemed like positions of battle. I watched without protest even though my fierce anticolonial perspicacity told me that these are the toys of genocide, icons of colonialism, and little boys should not be allowed to 38 3 play with them because it will create a subconscious desire to kill real Indians. As I pondered these thoughts, I suddenly realized that I could experiment with how the boys play with these toys. When all the figures are on the table, I ask, "What shall we do with these guys?" Neither answers. Realizing I need to coach them a bit, I ask, "Who are the bad guys and who are the good guys ... which guys are supposed to get killed?" My research questions are suddenly contaminated when the This content downloaded from 142.103.160.110 on Sat, 17 Oct 2015 21:24:10 UTC All use subject to JSTOR Terms and Conditions boys quickly reach into the Tupperware container and pull out a brontosaurus and a T. rex and began knocking down everybody, saying, "We have to kill them all." Unable to restrain my latent tendencies of revenge, I grabbed a pterodactyl and started making what I think are pretty good pterodactyl sounds while I used my guy to peck out the eyes of the cowboy who most looked like John Wayne. COWBOYS AND INDIANS: THE MASTER NARRATIVE The colonizer's falsified stories have become universal truths to mainstream society, and have reduced Aboriginal culture to a caricature. This distorted reality is one of the most powerful shackles subjugating Aboriginal people. It distorts all Indigenous experiences, past and present, and blocks the road to self determination.7 Years ago, when I was a child, my play with toy cowboys and Indians would have ended much differently than my above story. Having been inculcated with the master narrative, or what Howard Adams calls "the colonizer's falsified stories," my cowboys would have heroically killed the dinosaurs and then the Indians. Like many children on the North Dakota reservation where I grew up, my young mind had been intellectually conscripted by the local Bureau of Indian Affairs school to battle the delusion that we Indians were equal in standing to whites. Like most reservation schools during this era, not only was our education inferior and biased, it was also well versed in the oppression, control, and intellectual and cultural domination of us little brown prisoners. We quickly discovered that what we believed was not important unless it was about the great deeds of George Washington (the town destroyer) or Abraham Lincoln (the Dakota executioner) or other significant dead white guys. We learned that we did not know anything of value, nor did we have anything important to contribute from our culture unless it supported the myths of white supremacy. In junior high school we continued to learn we were primitive, superstitious people who should be thankful that God was on the side of the white people who came to the "new world" to settle and help us have a better life. In high school, lectures or readings rarely mentioned Indigenous Peoples except at Thanksgiving when we were told that this day was 39 special because (white) Pilgrims came here to escape religious persecution and then had a fine dinner with the Indians. Of course, we were never told just how expensive that fine dinner was. Years later, after reading the works of historian Alfred W. Crosby and demographer Henry F. Dobyns, I learned that all along the Eastern seaboard, during the time of the Pilgrims, the infectious diseases of whites wiped out This content downloaded from 142.103.160.110 on Sat, 17 Oct 2015 21:24:10 UTC All use subject to JSTOR Terms and Conditions between 60 to 90 percent of the Indigenous populations while colonists simultaneously murdered and terrorized children, women, and other unarmed Native civilians. For instance, in 1623 Captain William Tucker brought his soldiers to a Powhatan village to negotiate a peace treaty. After the treaty was concluded, he convinced the Indians to drink a toast and served them poisoned wine. About two hundred died instantly. Tucker's men then killed another fifty and brought home a number of the heads of their victims.8 The master narrative confirmed Indians were inferior to whites by way of a seemingly inexhaustible supply of western movies and TV programs that showed huge numbers of Indians could be easily defeated by a few cowboys with large, shiny, phallic-shaped pistols and an endless reserve of bullets. As a child I observed that whenever the TV Indians battled with the TV cowboys, not only did we spectacularly lose, but to add insult to this injury we were also presented as screaming, grunting, unreasonable savages who unjustly assaulted and/or killed what seemed like the most helpless, likeable, and innocent white people in the world. The TV Indians were the poorest of war tacticians, buffoons really, who would unfailingly ride directly into a great volley of bullets only to be killed over and over again in movie after movie. As I grew older it crossed my mind that the white stuntmen playing Indians who were repeatedly shot from their horses must have really hated us whenever their back problems or arthritis flared up in their later acting years. Master narratives are incomplete without music. Vital to defeating and dehumanizing Indians were appropriate tunes. Cowboys got the heroic or sweet-sounding compositions while Indians got the evil harmonies, the kind played while the innocent, big-bosomed, blonde white woman was being prepared to be stewed in a huge cauldron in front of a tipi with several savages dancing around her. However, even as a colonized child I wondered if these dancing "savages" were really Indians since none appeared to have any sense of rhythm. As young boys we watched the loser Indians in many westerns and, like many of our other young colonized Indian brothers who grew up on other reservation communities, we cheered for the cowboys whenever they kicked our people's butts. Perhaps what gave the master narrative the greatest credibility was that most of the men in my small reservation community made 40 L an everyday affair of wearing some vestige of cowboy apparel: hats, boots, shirts with mother-of-pearl buttons, silver belt buckles with golden inlaid bucking bulls or horses, and hand-tooled leather belts with an individual's first or last name engraved in western-style letters. Wanting so much to emulate the dress of our male role models, whom we noticed often occupied the alpha position in our community because of how they behaved, talked, and dressed, we young boys took to nagging our parents about getting us cowboy boots and clothes. For many of us, harassing our parents was fruitless since few could afford to buy the more expensive apparel. In a lot of families younger brothers and sisters often got hand-me-down clothes from older siblings or from what we called the mission barrel (used clothes that we would dig out from big round containers that the local Congregational Church filled up each week from donations given by white people). Whenever one of our "homeboys" got new boots or a hat or a shirt, the rest of us would gather around him to inspect his new assets, and then we would head home and complain to our parents that we wanted cowboy boots or clothes. The everyday discourse of people in my community was also highly supportive of the master narrative. Many of the men called each other "cowboy," and some would self-identify as an Indian cowboy. Often when male children cooperated or did some good deed they would be praised by being called cowboys. One of the groups that policed our appearance were the older men in my community who would often say that we (young boys) didn't look like cowboys at all but instead "looked like girls" whenever our hair got even the slightest bit long. My grandfather, a product of Indian boarding schools who sported a crew-cut hairstyle, never failed to rescue us from this name calling. I remember many hot summer days when he would round up us boys (his grandsons) and take us to my mother's house and give us "marine-style" haircuts (which we called skinners) while my mother and our older female relatives looked on and praised our cooperation saying, "Gee, you look good now, you look just like a cowboy." However, getting our heads shaved was never a pleasant experience since it felt like being emotionally robbed of our spirit and our ability to say no. With tears running down our little brown, dirt-stained faces, we would walk out of the house, eyes cast down, feeling humiliated and violated, looking like small brown skinheads. I don't ever recall any adults saying to us, "Gee, you look good now, you look like an Indian." I also recall that many times when a small boy was crying his w heart out due to bonking his head against a chair or the floor, mothers > or fathers, grandparents, or other older relatives would often try to get him to calm down by saying, "Oh, cowboys don't cry. Look at the cowboy, look at the cowboy." The cowboy discourse followed me into young adulthood, and I recall as a teen that whenever I stayed with a u particular uncle to help him with his ranch chores, he often communi- 4 cated to me in no uncertain terms that, when I worked for him, I had to act like a cowboy. This often meant I didn't eat or rest much, and if I got hurt I had to "tough it out." In fact, I remember the first time I asked my uncle if I could take a break from my work and get food, he firmly reminded me, "Cowboys don't need rest and cowboys don't need to eat." From that point forward, I did not question him but instead This content downloaded from 142.103.160.110 on Sat, 17 Oct 2015 21:24:10 UTC All use subject to JSTOR Terms and Conditions carefully observed that he was a cowboy, and if I wanted to be one I had to do as he did. Despite this uncle's loyalty to this image and lifestyle, he experienced a lot of racism and taunting from some of the white cowboys he interacted with because, to them, he was just an Indian posing as a cowboy. And because only whites can be "true" cowboys, he settled for being an "Indian cowboy" whenever he felt the sting of racism. Fortunately, my desire to be a cowboy or to have any association with this image quickly faded during my teen years following my reading of Vine Deloria Jr.'s Custer Diedfor Your Sins.9 During this same time I was fortunate enough to be exposed to different Indigenous spokespersons and groups, such as the American Indian Movement (AIM), who were advancing powerful political ideas that supported and extended Deloria's critique of American colonial society. Deloria's book was important to me since I found it to be a brilliant, honest, and courageous work that exposed, fiercely critiqued, and neutralized the myths and lies of the master narrative that, for the first fifteen years of my life, had made me into a compliant little Indian, inculcated with the belief that I was an inferior member of society because of my race. The words and ideas of other Indigenous leaders and groups gave me the permission that I needed to begin letting go of the shame that was imposed on me by the colonizer for being an Indian. In the end, both enabled me to begin searching for similar thinking that would prepare me to become intelligently outraged at the lies, distortions, and omissions that Americans had carefully and resolutely forced on our peoples. DECOLONIZING COWBOYS AND INDIANS Because decolonization requires a telling of the truth and completely calling into question the colonial structure,'0 it took some years before I stopped wearing cowboy apparel, believing the colonial master narrative, and referring to myself or other Indigenous Peoples as "Indians," "American Indians," "Native Americans," "cowboys," or "Indian cow- > boys." It also took some years for me to understand that colonialism is a sickness, an addiction to greed, supremacy, power, and exploitation and that cowboys and Indians are one of the colonizer's drugs of choice. Cowboys and Indians are this nation's most passionate, embedded form of hate talk. 42 P Colonialism has taught many Indigenous Peoples to be silent, passive, compliant victims who participate in, excuse, enable, or ignore the colonizer's addictive behaviors. Left unchecked, colonialism has continued to flourish, devastate, and suppress Indigenous Peoples, keeping them in the perpetual role of "the Indian," causing many to say, do, and think things they never would if their minds and hearts were free from American colonial rule. There are, however, antidotes to colonialism This content downloaded from 142.103.160.110 on Sat, 17 Oct 2015 21:24:10 UTC All use subject to JSTOR Terms and Conditions that Indigenous Peoples can and must employ: courage, intelligent resistance, development of a counterconsciousness and discourse, and a fierce ongoing critical interrogation of American colonial ideology. No matter how they have been portrayed in the past or present, cowboys and Indians are the consummate example of American colonialism. They represent the overt and hidden hatred and fear that many Americans harbor toward Indigenous, dark-skinned peoples. They are symbolic of the white colonizer's claim of superiority and Indigenous Peoples' inferiority. Cowboys have remained, in the hearts of most Americans, an evocative representation of American values: love of freedom, fairness, individualism, toughness, enterprise, forwardlooking attitude, and whiteness. Indians, on the other hand, have remained the savage, primitive, losing, dark-skinned, evil, antagonistic enemy. More recently, we are accused of being rich casino tribes who are ripping off the state tax base, getting people addicted to our gaming, and using our "massive profits" to become unduly politically influential in American colonial politics. My response to such complaints is: can you spell E-n-r-o-n?"

#### Vote NEG --- language matters and overdetermines the consequences of the plan

Joelle **Renstrom**, 3-25-**2021**, "We Shouldn't Invoke Colonialist Language To Justify Missions To the Cosmos," Wire Science, <https://science.thewire.in/the-sciences/why-should-we-invoke-colonialist-language-to-justify-missions-to-the-cosmos/> //SR

Last month, NASA’s Perseverance rover landed on the surface of Mars to much fanfare, just days after probes from the UAE and China entered orbit around the Red Planet. The surge in Martian traffic symbolises major advancements in space exploration. It also presents an opportune moment to step back and consider not only what humans do in space, but how we do it – including the words we use to describe human activities in space. The conversation around the language of space exploration has already begun. NASA, for instance, has been rooting out the gendered language that has plagued America’s space program for decades. Instead of using “manned” to describe human space missions, it has shifted to using gender-neutral terms like “piloted” or “crewed.” But our scrutiny of language shouldn’t stop there. Other words and phrases, particularly those that invoke capitalism or colonialism, should receive the same treatment. To some extent, language influences the way we think and understand the world around us. A dramatic example comes from the Pirahã tribe of the Brazilian Amazon, whose language contains very few terms for describing numbers or time. A capitalist culture in which time equals money likely wouldn’t make sense to them. Similarly, language likely affects humans’ thoughts and beliefs about outer space. The words scientists and writers use to describe space exploration may influence who feels included in these endeavours – both as direct participants and as benefactors — and alter the way people interact with the cosmos. Take, for example, John F. Kennedy’s 1962 Moon Speech, in which he three times used the words “conquer” and “conquest.” While Kennedy’s rhetoric was intended to bolster U.S. morale in the space race against the USSR, the view of outer space as a venue for conquest evokes subjugation and exploitation and exemplifies an attitude that has resulted in much destruction on Earth. By definition, conquering involves an assertion of power and mastery, often through violence. Similarly, former President Donald Trump is the most recent American president to use the term “Manifest Destiny” to describe his motives for exploring space, tapping into a philosophy that suggests humanity’s grand purpose is to expand and conquer, regardless of who or what stands in the way. In a recent white paper, a group comprising subject-matter experts at NASA and other institutions warned of the hazards of invoking colonial language and practice in space exploration. “The language we use around exploration can really lead or detract from who gets involved and why they get involved,” Natalie B. Treviño, one of the paper’s coauthors, told me. Treviño, who researched decolonial theory and space exploration for her PhD at Western University in Canada, is a member of an equity, diversity and inclusion working group that makes equity-related recommendations in the planetary science research community. She notes that certain words and phrases can be particularly alienating for Indigenous people. “How is an Indigenous child on a reserve in North America supposed to connect with space exploration if the language is the same language that led to the genocide of his people?”

## CASE

### 1NC - AT: Debris

#### No Escalation over Satellites – flips offensive dominant framing:

#### 1] Planning Priorities

Bowen 18 Bleddyn Bowen 2-20-2018 “The Art of Space Deterrence” <https://www.europeanleadershipnetwork.org/commentary/the-art-of-space-deterrence/> (Lecturer in International Relations at the University of Leicester)//Elmer

Space is often an afterthought or a miscellaneous ancillary in the grand strategic views of top-level decision-makers. A president may not care that one satellite may be lost or go dark; it may cause panic and Twitter-based hysteria for the space community, of course. But the terrestrial context and consequences, as well as the political stakes and symbolism of any exchange of hostilities in space matters more. The political and media dimension can magnify or minimise the perceived consequences of losing specific satellites out of all proportion to their actual strategic effect.

#### 2] Military Precedent

Zarybnisky 18, Eric J. Celestial Deterrence: Deterring Aggression in the Global Commons of Space. Naval War College Newport United States, 2018. (Senior Materiel Leader at United States Air Force)//Elmer

PREVENTING AGGRESSION IN SPACE While deterrence and the Cold War are strongly linked in the public’s mind through the nuclear standoff between the United States and the Soviet Union, the fundamentals of deterrence date back millennia and deterrence remains relevant. Thucydides alludes to the concept of deterrence in his telling of the Peloponnesian War when he describes rivals seeking advantages, such as recruiting allies, to dissuade an adversary from starting or expanding a conflict.6F 6 Aggression in space was successfully avoided during the Cold War because both sides viewed an attack on military satellites as highly escalatory, and such an action would likely result in general nuclear war.7F 7 In today’s more nuanced world, attacking satellites, including military satellites, does not necessarily result in nuclear war. For instance, foreign countries have used highpowered lasers against American intelligence-gathering satellites8F 8 and the United States has been reluctant to respond, let alone retaliate with nuclear weapons. This shift in policy is a result of the broader use of gray zone operations, to which countries struggle to respond while limiting escalation. Beginning with the fundamentals of deterrence illuminates how it applies to prevention of aggression in space.

#### Uncertainty from debris collisions creates restraint not instability BUT the aff’s reduction greenlights space war

MacDonald 16, B., et al. "Crisis stability in space: China and other challenges." Foreign Policy Institute. Washington, DC (2016). (senior director of the Nonproliferation and Arms Control Project with the Center for Conflict Analysis and Prevention)//Elmer

In any crisis that threatens to escalate into major power conflict, political and military leaders will face uncertainty about the effectiveness of their plans and decisions. This uncertainty will be compounded when potential conflict extends to the space and cyber domains, where weapon effectiveness is largely untested and uncertain, infrastructure interdependencies are unclear, and damaging an adversary could also harm oneself or one’s allies. Unless the stakes become very high, no country will likely want to gamble its well-being in a “single cosmic throw of the dice,” in Harold Brown’s memorable phrase. 96 The novelty of space and cyber warfare, coupled with risk aversion and worst-case assessments, could lead space adversaries into a situation of what can be called “hysteresis,” where each adversary is restrained by its own uncertainty of success. This is conceptually shown in Figures 1 and 2 for offensive counter-space capabilities, though it applies more generally. 97 These graphs portray the hypothetical differences between perceived and actual performance capabilities of offensive counter-space weapons, on a scale from zero to one hundred percent effectiveness. Where uncertainty and risk aversion are absent for two adversaries, no difference would exist between the likely performance of their offensive counter-space assets and their confidence in the performance of those weapons: a simple, straight-line correlation would exist, as in Figure 1. The more interesting, and more realistic, case is notionally presented in Figure 2, which assumes for simplicity that the offensive capabilities of each adversary are comparable. In stark contrast to the case of Figure 1, uncertainty and risk aversion are present and become important factors. Given the high stakes involved in a possible large-scale attack against adversary space assets, a cautious adversary is more likely to be conservative in estimating the effectiveness of its offensive capabilities, while more generously assessing the capabilities of its adversary. Thus, if both side’s weapons were 50% effective and each side had a similar level of risk aversion, each may conservatively assess its own capabilities to be 30% effective and its adversary’s weapons to be 70% effective. Likewise, if each side’s weapons were 25% effective in reality, each would estimate its own capabilities to be less than 25% effective and its adversary’s to be more than 25% effective, and so on. In Figure 2, this difference appears, in oversimplified fashion, as a gap that represents the realistic worry that a country’s own weapons will under-perform while its adversary’s weapons will over-perform in terms of effectiveness. If both countries face comparable uncertainty and exhibit comparable risk aversion, each may be deterred from initiating an attack by its unwillingness to accept the necessary risks. This gap could represent an “island of stability,” as shown in Figure 2. In essence, given the enormous stakes involved in a major strike against the adversary’s space assets, a potential attacker will likely demonstrate some risk aversion, possessing less confidence in an attack’s effectiveness. It is uncertain how robust this hysteresis may prove to be, but the phenomenon may provide at least some stabilizing influence in a crisis. In the nuclear domain, the immediate, direct consequences of military use, including blast, fire, and direct radiation effects, were appreciated at the outset. Nonetheless, significant uncertainty and under-appreciation persisted with regard to the collateral, indirect, and climatological effects of using such weapons on a large scale. In contrast, the immediate, direct effects of major space conflict are not well understood, and potential indirect and interdependent effects are even less understood. Indirect effects of large-scale space and cyber warfare would be virtually impossible to confidently calculate, as the infrastructures such warfare would affect are constantly changing in design and technology. Added to this is a likely anxiety that if an attack were less successful than planned, a highly aggrieved and powerful adversary could retaliate in unanticipated ways, possibly with highly destructive consequences. As a result, two adversaries facing potential conflict may lack confidence both in the potential effectiveness of their own attacks and in the ineffectiveness of any subsequent retaliation. Such mutual uncertainty would ultimately be stabilizing, though probably not particularly robust. This is reflected in Figure 2, where each side shows more caution than the technical effectiveness of its systems may suggest. Each curve notionally represents one state’s confidence in its offensive counter-space effectiveness relative to their actual effectiveness. Until true space asset resilience becomes a trusted feature of space architectures, deterrence by risk aversion, and cross-domain deterrence, may be the only means for deterrence to function in space.

#### AT: Breen 18 --- this is highlighted down to like 2 sentences --- a. they def can’t solve --- it’s about any satellites being left in orbit, b. no war warrant --- “could incite armed conflict” does not mean escalation

#### AT: ViaSats --- again, no warrant for escalation --- also supercharges our debris argument

### 1NC - AT: Military

#### The military ev --- there’s no terminal impact in the ev --- all it says is sats might have military usages but there’s not a warrant for war or why that causes tensions --- the no war ev is above

#### Public sector activities is a massive a/c to Mecklen --- Russian and Chinese ASATs and military usage, plus ground based dual-use systems --- leasing orbital slots doesn’t solve

Mecklin 22

John Mecklin Why the final frontier should not become the final battleground Bulletin of the Atomic Scientists Volume 78, 2022 - Issue 1: Special issue: Conflict in space Pages 1-2 | Published online: 17 Jan 2022 Download citation <https://doi.org/10.1080/00963402.2021.2020988> <https://www.tandfonline.com/doi/full/10.1080/00963402.2021.2020988> -CAT

Since the launch of Sputnik and the so-called missile gap of the late 1950s, the United States and the Soviet Union (and later, Russia) have vied for space supremacy. Through much of the competition, prestige and propaganda value have played at least as large a role as space-faring hardware. Laika, the first dog in space, and Yuri Gagarin, the first man, were potent symbols of a wide-ranging Soviet challenge to American leadership. The United States fought back by orbiting Ham, the space chimp, and winning the race to the moon. Russian and American space efforts have long been paralleled by less public efforts to use space for military purposes. The fearsome and obvious downsides of space-based warfare led to some early and fairly effective international agreements regulating military activities in space. Nuclear weapons and other weapons of mass destruction, for example, are not (as far as I know) stationed in orbit, thanks to the 1967 Outer Space Treaty. Now, more than five decades later, more countries (and private companies) are using space for more purposes, the possibility of space conflict seems to be growing, and the regulations of an earlier era seem increasingly insufficient to the space reality of the 21st century. In November, Russia used a ground-launched missile to destroy one of its own satellites, creating thousands of pieces of debris that could have endangered the International Space Station. The action drew international condemnation. But the Russian anti-satellite missile test was hardly the first, and it is only one of many efforts, by many countries (including, notably, China) that suggest competition in space is increasing as space technologies and capabilities advance. To lead off this issue on this 21st century space race, I spoke to Robert Latiff, a retired US Air Force major general and Bulletin Science and Security Board member, about the worsening international security situation as countries jockey for both advantage in space. Latiff, who has served on the staffs of US Air Force Headquarters and the Secretary of the Air Force, summed that situation up in this way: “I guess the point is that there’s a lot of aggressive, sort of threatening language that’s out there. So it’s a lot more, seems to be anyway, a lot more dangerous.” In their article, “Cis-lunar space and the security dilemma,” University of British Columbia space law experts Michael Byers and Aaron Boley explain how and why the United States is planning to expand its military space activities from Earth orbit into the vast region between Earth’s geosynchronous orbit and the moon. If that move into the area known as “cis-lunar space” does occur, they argue, the militaries of other countries will surely follow – unless an agreement to demilitarize the area is reached. The dangers of conflict in space are vividly displayed in “A China-US war in space: The after-action report,” an analysis of a complex space war game involving China, the United States, and their allies or client states conducted by the Nonproliferation Policy Education Center. Written by NPEC executive director Henry Sokolski, this piece explains why, in the near and medium term, space war could occur – but probably won’t be waged between entirely dedicated military systems. More likely, it will involve ground-and space-based threats – including laser satellite trackers, commercial space surveillance systems, space debris-removing satellites, and refueling spacecraft – that have legitimate civilian uses but can be flipped to conduct military missions. Indeed, the rise of the private sector in space has complicated the security situation for space-faring nations. As Victoria Samson of the Secure World Foundation notes in “The complicating role of the private sector in space,” there are some 4,800 active satellites in orbit around Earth, and 1,850 of them belong to Elon Musk’s SpaceX’s Starlink internet service. And this is only the first wave; there are, Samson writes, plans for mega-constellations that could wind up putting more than 100,000 new satellites in low Earth orbit. Even a small fraction of that number will force a fundamental shift: Musk and other wealthy private sector space cowboys will become major players in space, and some countries – including, particularly, Russia – may feel threatened by the change. “It is important to work to develop new governance of space to meet the emerging needs of this ecosystem. Otherwise,” Samson writes in understated prose, “we run the risk of inadvertent escalation and even conflict in space that can extend down to Earth.” As an old television series1 and the exploits of the early human, chimp, and canine astronauts remind us, space can be an inspiring frontier. It has already provided new and almost magical capabilities in communications, navigation, and the monitoring of natural resources and the climate that could expand vastly, for the good of all, if space is managed as a cooperative commons rather than a potential field of battle. “There ought to be some understanding that those things are there for the good of [hu]mankind,” Latiff told me. “We’re not talking just about war-fighting and national security here.”

**No impact even if it happens.**

Roger **Handberg**, Professor in the School of Politics, Security, and International Affairs at the University of Central Florida, **‘17**, Is space war imminent? Exploring the possibility, Comparative Strategy, Vol. 36, No. 5, p. 413-425

The assumption made is that space war will be successfully waged in both the heavens and on the Earth itself. This assumption, however, is grounded on **several hypotheticals** occurring. First, that total devastating strategic surprise can be achieved—the side attacked becomes so damaged and devastated that further resistance is impossible to sustain regardless of national will, since nuclear weapons overhang the entire enterprise. The analogy usually invoked for American audiences is a “Pearl Harbor” type attack. This scenario is premised on equivalent American incompetence and lack of readiness as exhibited in December 1941. One must note that Pearl Harbor ended as a strategic failure for Japan—it led to defeat because the attack mobilized U.S. power without hesitation, given the intense political divisions over whether to enter the worldwide conflicts already raging. The attack was a military failure because Navy carriers were not destroyed along with battleship row along with critical fuel facilities. Similar analogies invoke September 11, 2001 as the prototype for such attacks more recently, but the same caveats apply. Total surprise assumes that all relevant opponent systems and civilian assets are disabled and left vulnerable to follow on attacks. In fact, collapse of U.S. defenses leaves U.S. cities as hostages to the rulers of the heavens, or vice versa if the U.S. moves first. Space war is extremely destabilizing, as will be discussed, since survivability of one's strategic assets becomes problematic. Second, surprise requires that **sufficient offensive space assets** be placed in orbit without triggering a response by other states—the scale of such technology deployment is **in itself** possibly **self-defeating** given high costs and a likely lack of launch capacity. In addition, much launch capacity is now **international** rather than national, so maintaining secrecy becomes even more difficult. Space as an operational environment suffers from excessive transparency, meaning any launches can be monitored and tracked by others with strong evidence as to what is being deployed. One must remember that the original satellite launches in the 1950s were accurately tracked by a British grade-school class as a science project. In addition, at least since the early 1960s, remote sensing has increased exponentially the global capability to detect buildup of military assets of differing types, whether in space or on the ground. Commercial remote-sensing capabilities further enhance the capacity to detect militarily relevant actions. For example, commercial imagery is accessed by private parties to monitor the North Korean missile and nuclear weapons programs, in effect expanding the capacity of the world to look in on various states' interior regions, scanning for relevant information, including weapons buildup and launch capabilities. Even construction of physical facilities for production of space assets or for other weaponry can be monitored, making surprise more difficult but not impossible, as demonstrated in earlier monitoring of North Korea and, in 1998, the nuclear tests by both Pakistan and India. That means if the ASAT weapon**s** come from ground locations, there is a high probability that they can be detected but no guarantee exists that detection will in fact occur. The uncertainty will impact calculations of attack success. Third, the most obvious initial attack of space-based assets will most likely come from cyber attacks, given that such actions do not necessarily require the scale of resources necessary for other modalities such as kinetic weapons, or even lasers or other energy-type weapons. One will have to position the weapons plus the infrastructure to permit rapid recycling of the weapons for the next attack. Firing off interceptors will likely be a one-off, meaning extremely precise targeting will be required if the attack is to be successful. Note that none of these systems require that individuals be placed in Earth orbit, despite the imagery describing such operations in fictional universes. Deployment requires a large lift capacity for initial deployment plus replenishment of destroyed or inoperative space assets, since a space conflict assumes that assets will be lost either kinetically or be compromised by cyber or energy beams. In any case, the combatants must be able to recover their capabilities lost during the conflict; failure to do would mean defeat or at least stalemate, negating the reason for the attack. That raises a major question when one considers the problem or expectation that space war can be successfully conducted or defended. Operationally Responsive Space (ORS) remains a critical weak point for all potential space-war participants. Loss of space assets occurs routinely during operations, but actual combat losses can be exponential depending on the weaponry used, and replacing those losses becomes the race to the next level after the initial exchange or combat. Unfortunately, ORS remains a major weakness of the United States and likely other states; deploying replacement satellites remains a multiyear process, while launch capabilities are scheduled long in advance. The rise of multiple private-launch competitors may partially alleviate some of the delay but that remains problematic given that the military payloads may be competing with commercial vendors also trying to replace losses. The tradeoff is that. in principle, private-launch vendors may be able to do so more cheaply, but their capacity may be saturated by demand from the civil and commercial sectors, leaving few “uncommitted” launch options for military purposes. Normally this is not an issue, but the available launch options may be third party rather than national-flag carriers, which raises severe security concerns. Fourth, **several other assumptions** become essential to make the strategy work, including that such an attack does not render Earth orbit so debris-saturated that further military space **op**eration**s** become impossible to sustain. Also, damage to civilian space assets remains, such that their continuation is possible if undamaged replacements can be quickly reintroduced to restart economically critical operations. Globalization has been fostered through satellite technologies. Their disruption can be devastating for all parties, regardless of who is the winner or the loser. What may occur is the graveyard of the modern economic system. No potential space participants would be immune to the damage, regardless of whether or not they were participants in the actual conflict. Fifth, there must be no difficulty in separating potential targets from the enemy, allied states, and nonbelligerent states. This creates a situation in which the spread of space **tech**nologies globally **complicates actions**, expanding the range of participants beyond the combatants, much like earlier wars at sea, where there were the combatants' ships, along with those of nonbelligerents, including neutrals whom the combatants struggled to draw into the conflict on their side, or at least to render their services unavailable to the other side. The earliest discussion of space conflict was premised on Cold War analogies, meaning two major combatants, either U.S.–Russia, or U.S–-China, or even a three-way war. Presently, analyses focus on a bilateral conflict with the U.S. opposed to China and Russia. Whether that would occur is obviously unknown, despite political rhetoric about a Eurasia coalition of likeminded states. What it does is multiply the number of potential targets and complicates reactions to neutrals' actions to protect their interests or assets. The distinction between combatants and neutrals or third parties will be possibly blurred beyond separation. The byproduct of a kinetic space conflict is massive amounts of space debris, destroying or damaging most space assets regardless of their state sponsor or nationality. Initial attacks may be focused and precise, but the result is still the same. The debris generated by armed conflict will endure beyond the immediate clash. The obvious alternative is a strictly electronic attack on space assets' operating systems, leaving the satellites in orbit, although without the ability to move them or control possible erratic changes in orbit due to collisions with other space debris. Other forms space war will take Reality is more complicated—kinetic action produces debris, the ultimate deterrent to actual space war. Therefore, space war could likely track several distinct phases. The first is cyber attacks, which disable or destroy the working systems of the spacecraft or the ground-support network—in effect, a series of stealth attacks. Civilian satellites are extremely soft targets—defense requires a capacity to detect and analyze any attack on the spacecraft, not available presently for most commercial spacecraft due to cost considerations. Otherwise, one could use nuclear weapons to create electromagnetic pulses (EMP) which can fry unprotected electronics both in space and on the ground, depending on where the weapons are detonated. Interestingly, space war scenarios have some territorial war aspects in that any attacks on space assets will devastate both military and civilian targets without distinction between the war participants and civilians. Similar to unrestricted submarine warfare, all targets in the relevant area will become casualties or otherwise impacted in their operations. Second, attacks that are conducted against the ground down links and/or communications systems, leaving the spacecraft without guidance or instructions, and also no information is returned to the commanders even if the satellites survive the initial onslaught. These can involve kinetic attacks against specific locations or insertion of special operations forces to render the facility inoperative. For example, antennas can be disabled or destroyed, disrupting operations until new facilities are brought online. Other alternatives could include kinetic weapons launched from space, “rods from God.”20 Air strike packages could include electronic warfare elements capable of scrambling or disrupting operations of such facilities even prior to physical strikes against the targets. Spacecraft not destroyed or disabled in the initial two stages of the attack can be directly attacked by “dazzling” their receivers, with laser impulses destroying the receivers for which there are few replacements without replacing the spacecraft physically. Third, rapid replacement of inoperative satellites, regardless of the reasons, does not occur, which translates into a race for the third, possibly end, phase of the war, replenishment. Inability to replace losses may mean that **none of the combatants are able to dominate** in the end, meaning conventional conflict may be the outcome, although issues of global reach may **confine conflicts to relatively small areas**. In previous conventional conflicts, large-scale forces were moved, albeit slowly, across the globe to the conflict, i.e., Desert Shield morphing into Desert Storm after a nearly six-month buildup.

### 1NC - AT: Solvency

#### Johnson 20 flows NEG --- here’s the rest of the card

**[Their card ends]**

No, This Is Not Impermissible Appropriation An opposite conclusion can also be reasonably arrived at when approached along the following lines. The counter argument would assert that the deployment and operation of these global constellations, such as SpaceX’s Starlink, OneWeb, Kepler, etc., are aligned with and in full conformity with the laws applicable to outer space. These constellations are merely the exercise and enjoyment of the freedom of exploration and use of outer space and do not constitute any impermissible appropriation of the orbits that they transit. Freedom of Access and Use Permits Constellations Rather than being a violation of other’s rights to access and explore outer space, the deployment of these constellations is more correctly viewed as the exercise and enjoyment of the right to access and use outer space. Article I of the Outer Space Treaty establishes a right to access and use space without discrimination. Not allowing an actor to deploy spacecraft, regardless of their number or destination, would be infringing with the exercise of their freedom. It would be discriminatory. Additionally, actors do not need permission from any other State, or group of States, to access and explore outer space. Aligned with the Intentions of the Outer Space Treaty This use of outer space by constellations in LEO, while not explicitly mentioned by the drafters of the Outer Space Treaty or other space law, actually is the fulfillment of their visions for the use of outer space. The preamble to the Outer Space Treaty (which contains the subject matter and purpose of the treaty and can be used for interpreting the operative articles of the treaty) speaks of the aspirations of humanity in exploring and using outer space. It is easy to see constellations that will provide Internet access to the world as fulfilling the visions of the drafters: The States Parties to this Treaty, Inspired by the great prospects opening up before mankind as a result of man’s entry into outer space, Recognizing the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes, Believing that the exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development, Desiring to contribute to broad international cooperation in the scientific as well as the legal aspects of the exploration and use of outer space for peaceful purposes, Believing that such cooperation will contribute to the development of mutual understanding and to the strengthening of friendly relations between States and peoples, As such, subsequent article of the Outer Space Treaty should be read in a permissive light, as permitting constellations, rather than a restrictive light which only sees potential negative aspects of constellations. Due Regard and Harmful Contamination Will be Addressed Operators in LEO are well aware of the challenges to space sustainability that their constellations will pose and will be taking efforts to mitigate the creation of debris. OneWeb is keenly focused on space sustainability and has even argued that the current norm, whereby spacecraft are not in space for longer than 25 years and are deorbited from lower orbits at the end of their lifetime (aka post mission disposal), is not sufficient The Legal Status of MegaLEO Constellations and Concerns About Appropriation... 19 to keep outer space clean and that shorter lifespan limits should be imposed on operators, especially operators in LEO, and operators of small satellites. Additionally, these systems will be able to cooperate with emerging space safety and space traffic management plans and can operate in ways that do not restrict or impinge on other users of the space domain. Because due regard is therefore displayed for the space domain, and to the interests of others, these constellations do not prejudice or infringe upon the freedoms of use and exploration of the space domain and are therefore not occupation, or possession, much less appropriation. This Does Not Constitute Possession, or Ownership, or Occupation The use of LEO by satellite constellations is substantially similar to the use of GSO, and therefore permissible. In each region, individual actors are given permission - either from a national administrator or from an international governing body (the ITU) via a national administer–to use precoordinated subsections of space. In a way that is overwhelmingly similar to the use of orbital slots in GSO, the placement of spacecraft into orbits in LEO or higher orbits does not constitute possession, ownership, or occupation of those orbits. This is because States (and their companies) have been occupying orbital slots in GSO for decades, and these uses of GSO have never been accused of “appropriating” GSO. The users have never claimed to be appropriating GSO, and their exercising of rights to use GSO is respected by other actors in the space domain. This is the same situation for other orbits, including LEO and other non-Geostationary orbits. And while GSO locations are relatively stable (subject to space weather and other perturbations, and require stationkeeping), spacecraft in LEO are actually moving through space and are not stationary, so it is even more difficult to see this use by constellations as occupation, much less appropriation. Moreover, Space Situational Awareness (SSA) and Space Traffic Management (STM) will allow other uses to use these orbits, and nothing about the use of any one user necessarily precludes others. Lastly, there is no intention by operators of constellations to exclusively occupy, must less possess or appropriate, these orbits. Would not the appropriation of outer space be an intentional, volutional act? No such intention can be found in the operators of global constellations.

#### AT: Eymork ---

#### Eymork is a master’s thesis --- that’s not real research

#### Insert this re-highlighting --- Eymork is about mining not orbital slots, there’s one line about radio frequencies which is not a solvency advocate, and it proves historical precedent for the US to not follow on

Tania Patricia Eymork. “International Negotiations of Natural Resources on the Moon and Other Celestial Bodies: Future Cooperation or Conflict?” Norwegian University of Life Sciences, Department of International Environment and Development Studies, Noragric. May 2012. <https://nmbu.brage.unit.no/nmbu-xmlui/bitstream/handle/11250/187862/eymork_master2012.pdf?sequence=3>. -CAT

The reason for highlighting the issue of REE’s is that this issue may also be a good reason to mine on the Moon. Those most dependent on the space industry would be the most threatened, the most dependent are the major space nations i.e. USA, Russia, China, India, Japan This argument, Lutes, 2008, suggests cooperation among these: Cooperation in a globalized society encourages peace and stability, and the space industry is highly globalized. Cooperation leads to technological developments and advancements, political stability and socio-economic strength especially in Less Developed Countries (Lutes, 2008). 6. International Treaties with Analogues. In attempting to establish a (new) legal regime for mining on the Moon and other celestial bodies, it is useful to look to analogous situations in international law to consider the issues discussed and how they were resolved. Whilst the Moon may be the most exciting area within the international mining debate, international mining treaties have been concluded regarding the deep oceans including the Arctic, and the continent Antarctica. These areas have much in common with the Moon and other celestial bodies. Geographically both areas are situated in harsh environments, are difficult to reach to extract natural resources, and difficult to live in. Further, they are also designated international areas in which no nation has a sovereign claim. After World War II in 1945, the establishment of permanent settlement on Antarctica seems to follow the same pattern as the colonization of the New World as mentioned above. Conflicting territorial claims by countries such as Argentina, Australia, Great Britain, Chile, France, New Zealand and Norway were leading towards conflict. The Antarctic Treaty from 1959 postponed territorial claims and established a legal regime that came into force in 1961 banning any military activity and exploitation as the OST. Until 1991 the continent was peacefully studied until technological advancements within oil and minerals extraction developed. Governments and corporations wanted to open up for exploitation purposes of oil and gas. However, today it is a protected area with successful conflict prevention. Since the second half of the twentieth century, technological advancements of especially floating oil and gas platforms able to reach the sea bottom for the exploitation of natural resources were commercialized. However, the question in terms of governance was by whom and under whose control. The United Nations became the main body to address these issues and to prevent conflicts where upon the 1982 Convention on the Law of the Sea (UNCLOS) was established. Rules and guidelines were agreed upon that expanded national control over coastal regions including the oversight of any commercial activity on the ocean floor, which would be excluded from possible national territorial appropriation. The USA refused to sign due to its opposition to the extension of exclusionary territorial waters and the United Nations treatment of the seabed as the Common Heritage of Mankind. Hence, the UNCLOS established the International Seabed Authority (ISA), which carries requirements to any prospecting for natural resources on the seabed to have international approval and license to ensure compliance with the UNCLOS clause regarding the Common Heritage of Mankind38. The USA remains outside the UNCLOS regime today as it does with the Moon Treaty of 1979. As per today, China, France, India, Japan, Russia and South Korea have registered with the ISA39, thereby retaining exploratory, but not yet exploitive rights, to certain identified regions of the seabed. However, no commercial mining has yet been carried out and as per today The Mining Code40 has yet to be completed. No nation owns the North Pole or the region of the Arctic oceans surrounding it. Russia, Norway, the USA, Canada, and Denmark (Via Greenland) are Arctic states bordering the Arctic Ocean and are limited to a 370 km41 economic zone around their coasts. The Arctic is warming. Surface air temperatures in the Arctic since 2005 have been higher than for any five-year period since measurements began around 1880. The increase in annual average temperature since 1980 has been twice as high over the Arctic as it has been over the rest over the world. Nearly all glaciers and ice caps have shrunk and the Arctic sea-ice decline has been faster during the past ten years than in the previous 20 years (Arctic Monitoring and Assessment Program, 201142). According to the Stockholm International Peace and Research Institute (SIPRI), ice-melting increasing may become one of the geopolitical debates in our time as a result to gain access to the region’s most important natural resources and transport routes. Countries have announced new military strategies in this region such as Canada43 and the USA, Russia44 and China. Tensions may emerge over who will determine the future of this region. Will it be the five littoral Arctic states45, or will it be the eight Arctic Council states46, or will a wide variety of countries be able to develop the region? Accordingly, there are challenges emerging in respect in the Arctic and in the management through cooperation based on international law and multilateral agreements. The Arctic Council strives to promote consensus and cooperation, however as an international organization without a firm legal charter, the Council is constrained in what it can do and several of the Council’s member states oppose broadening its mandate to deal with legal issue (SIPRI, 2011). 7. FINDINGS Space law derive from the desire of countries to derive benefits from what is called a common resource – outer space that has been likened to the high seas or the continent of Antarctica – a resource that no nations owns, however have a strong economic, political and even military interest for countries. As access to outer space is now more accessible and more and more space faring nations are entering the space market, space treaties and conventions assist in the coordination on how countries view space and to a certain degree regulate its usage. **Due to the growth of the space industry, this may be a complicated task**. This can be **exemplified by** one major segment such as **the coordination of** the use of **satellites** for communication, remote sensing, navigation, meteorology, etc. Without coordination of how the various frequencies are used there would be interference and chaos. **Further, if satellites deployed are not coordinated there would be difficulties of interference and** possibly **collision.** To retain international cooperation and to avoid conflict, a specialized agency of the United Nations (UN) the International Telecommunication Union (ITU). The ITU’s role is provide registration of radio frequencies used in outer space, to assign the usage of the various orbits, to set standards for the provision of various types of space services (Pelton et al. 2008:291-293). 8. CONCLUSION The need for a safe, clean, and non-radioactive energy resource to serve all and especially people in extreme poverty. Even though the development of a helium-3 based fusion reactor is still under development, we still need to await an eventual establishment of an international treaty and sets the rules for all nations who wish to explore and exploit the universe for the benefit of human kind….in an orderly manner to enable a cooperative state of mind to all.

1. **Multilat fails ---**
2. **Politicization and counter-institutionalization outweigh aff cooperation warrants.**

Michael **Zurn**, WZB Berlin Social Science Center, '**18**, Contested Global Governance, Global Policy Volume 9, Issue 1, February 2018

**Challenges facing the global governance system: politicization and counter-institutionalization** My goal is to formulate a positive theory that goes beyond the negative descriptions of global governance as post- © 2018 University of Durham and John Wiley & Sons, Ltd. Global Policy (2019) 9:1 Michael Zurn € 140 internationalist and helps to move global governance beyond its embryonic state (see Coen and Pegram, this issue). My major claim is that the features of the current global governance system have endogenously produced two main forms of contestation: politicization of international authorities and counter-institutionalization. Internal tensions of the system fuel conflicts and demands for change (see Sørensen, 2011), which lead to turbulence (Rosenau, 1990) and possibly to gridlock in (Hale and Held, 2013; Hale et al., 2017), or the decline of (Overbeek et al., 2010), global governance. Contestation of international institutions by non-state actors takes place mainly in the form of **politicization**. Prime examples are, at the transnational level, anti-globalization protests directed against neo-liberal policies or, at the national level, populist backlashes against open borders and public authorities beyond the nation state. While in the early 2000s transnational protests against neo-liberalism were most visible, we currently see a rise of right-wing populist parties, with Brexit and Donald Trump the most consequential outcomes. Yet resistance to global governance is only one aspect of politicization. Nonstate actors have also expressed direct support for more global governance and utilized international institutions for specific policy purposes. As a response to Brexit, for instance, supporters of the European Union (EU) now organize marches for the EU. Politicization in effect leads to a polarization of opinions about, the mobilization for or against, and a growing visibility of an issue handled by an international institution. In general, higher levels of authority lead to higher levels of politicization. The challenges put forward against international institutions with high levels of authority target not only their policies, but also their legitimation. Institutions such as, particularly, the UNSC, the IMF, and the World Bank are criticized for the opaqueness of their decision-making, their narrow technocratic justification, and institutionalized inequality (Zurn et al., 2012). Moreover, different types of € authority lead to different ways and levels of politicization. Public authority exercised by transnational institutions, for instance, is less often politicized than authority exercised by international institutions, because the latter’s mandate to make decisions is more visible and offers more opportunity structures for politicization. For similar reasons, political authorities are more intensely politicized than epistemic authorities. The politicization of international institutions usually follows four steps. First, due to increased denationalization and trans-border externalities, international regulatory deficits are denounced. Consequently, transnational non-governmental organizations (NGOs), expert groups, or international organizations (IOs) identify the need for international regulation. Second, this leads – most often in times of crisis – to a strengthening of the international authority with new and usually more intrusive competences. For instance, the immediate response to the debt crisis in southern European states was a significant strengthening of EU competences. Third, this makes international authority tangible for broad sections of society and provides a political opportunity structure for politicization. The Greek resistance to EU-imposed austerity measures may be an extreme example, but it is not an exception. Finally, the public authority of international institutions gets challenged on grounds of insufficient legitimation. State contestation takes place when states demand change or dismantling of international authorities. While states ‘delegate’ international authority to international institutions, they do this in a reflexive manner. As a consequence, **states simultaneously recognize and challenge inter and transnational authority**. They contest the international institutions they have themselves created at the very moment these institutions produce **decisions and interpretations they dislike**. But the response is not – as conventional cooperation theory in the anarchy paradigm would suggest – to deviate and exit. Rather, states form new institutions closer to their current interests in order to influence or replace existing ones. This strategy can be labelled ‘counterinstitutionalization’. 7 Both the incumbent powers of the West and rising powers use counter-institutionalization. Incumbent states use it typically to challenge IOs that they have themselves created, but without institutionalizing inequality. Over time, the ‘onestate, one-vote’ principle has led to a loss of control over outcomes in these IOs. Even if the incumbent states do not quit their membership altogether, they can delay, reduce, or freeze their budgetary contributions while, in parallel, increase their support for other international or bilateral institutions with a similar mandate, thereby decreasing the relevance of the original institution. In contrast, if incumbent states enjoy institutionalized privileges in international authorities, a shift in the power constellation leads to contestation and delegitimation by the rising powers. Institutions such as the Non-Proliferation Treaty regime, the World Bank, the IMF, the UNSC, and the G7/8 meetings are cases in point. Rising powers put forward demands for reform and threaten to counter-institutionalize. Yet the rhetoric of counter-institutionalization by rising powers is not necessarily the endpoint of an institution’s power mismatch trajectory. The authority holders may give in to the demands and initiate reforms that alleviate institutional inequality. The outcome is rarely all-out institutional change, but often growing complexity through ‘layering’ – the adding of new organizational elements onto a rigid but increasingly irrelevant historical core (see Thelen and Streeck, 2005). Although rising powers often use a rhetoric that emphasizes ‘sovereignty’ when challenging existing institutions, they do not have an interest in undermining the global governance system as such. Rather, they want to change specific institutions and challenge the specific exercise of authority. They target primarily those specific institutions in which established powers have crafted institutionalized inequality and secondarily those in which costs – at least from their perspective – are distributed unfairly. The perceived alternative to the status quo is not exiting the global governance system, but changing it to one that is more beneficial to the rising powers. A global cleavage cutting across different issue areas between the established and the rising powers can therefore not be observed. **Conflict constellations are rather embedded in and structured by the design of specific international authorities**. The coalition of states that aim at institutional change thus varies from issue area to issue area as does the coalition of the defenders of the status quo. The coalition of challengers to the status quo looks quite different in the case of the IMF than in the case of the Non-Proliferation Treaty (see Stephen and Zurn, forthcoming).

#### AT: Pershing --- supercharges the link to the Runaway DA and it’s about property rights again . . .

Pershing 19

Abigail D. Pershing, J.D., Yale, “Interpreting the Outer Space Treaty’s Non-Appropriation Principle: Customary International Law from 1967 to Today,” 2019, *The Yale Journal of International Law*, Vol. 44, https://openyls.law.yale.edu/bitstream/handle/20.500.13051/6733/Pershing.pdf -CAT

B. A New Property Rights Proposal: Leasing Space One promising proposal that does not appear to have received much attention in the literature is the concept of leasing space to nations, private individuals, or companies rather than allocating it as permanently-owned property. It appears that the only authors who have even tangentially considered the possibility of leasing property rights in space beyond rights to mineral extraction are Marcel Williams and G.S. Sachdeva. Williams’ writing is limited to a thought experiment in which he imagines renting out up to one percent of the moon’s surface. This property would be directly leased to national governments, which in turn would be vested with the power to sublease sections of this territory to private companies or individuals.134 This proposal is not elaborated any further and is left as a broad-strokes outline. The second mention of leasing or renting space comes from G.S. Sachdeva, who argues that a U.N. Space Superintendence Authority could grant leases to those able to pay.135 Yet this theory is limited to a discussion of renting property rights in particular orbits to allow for hovering geostationary space hotels and does not delve into questions of renting land on celestial bodies. The concept of leasing outer space deserves greater consideration by space law scholars. This Section sketches a brief outline of how such a system might operate via an internationally-run space property rental system modeled on UNCLOS. Although UNCLOS itself is deeply problematic in its potentially devastating environmental consequences and negative impacts on indigenous peoples as it regulates deep-sea mining,136 the UNCLOS model may nonetheless be the best option for preserving non-space-faring nations’ rights with regard to outer space, given its success in providing developing nations with a voice in the regulation of the high seas and the seabed beyond national jurisdiction.137 It is worth noting that although very few scholars appear to have considered the possibility of renting space, several have examined the similarities between UNCLOS and space law.138 The approach advanced here differs from the conventional approach to this comparison in that it suggests that the international community move beyond merely authorizing nations or individuals to extract a certain quantity of minerals and instead consider the possibility of leasing out actual tracts of space land. Opened for signature on December 10, 1982, UNCLOS establishes the international rules that govern the use of the world’s oceans and their resources. An examination of UNCLOS is especially apt because it deals with resources— the high seas—that, like space, are not subject to national appropriation. In language strikingly similar to Article II of the Outer Space Treaty, Article 137 of UNCLOS reads: No State shall claim or exercise sovereignty or sovereign rights over any part of the Area [resources of the seabed and ocean floor beyond the limits of national jurisdiction] or its resources, nor shall any State or natural or juridical person appropriate any part thereof.139 Although there are clear similarities between the two treaties, there are substantial differences as well, many of which would be useful in informing an update to the Outer Space Treaty. In addition to extending the prohibition on sovereignty to individuals as well as to nations, UNCLOS goes far beyond the Outer Space Treaty in detailing the limits of the non-appropriation principle. All of Part XI of UNCLOS, totaling fifty-eight Articles, gives a detailed description of how States can negotiate within the bounds of the non-appropriation principle to exploit ocean resources. Of particular relevance for purposes of crafting a parallel space law proposal is UNCLOS Part XI, Section 4, which lays out the rules governing the International Seabed Authority—the main mechanism through which States and private companies can legally exploit ocean resources, including mining of the deep seabed.140 Using UNCLOS as a model, a similar system may prove promising for the evolution of space law. However, the new space system should allow for rental of space land instead of merely allowing for the extraction of space resources. As with UNCLOS, any such space leasing system should be run through the United Nations. Situating such a system in this forum would help the international community stay true to the intentions of the Outer Space Treaty, which provides, in the words of one author, a “philosophical roadmap for the future development of the outer space legal regime.”141 Although a new committee within the United Nations could be formed for this purpose, the existing Committee on the Peaceful Uses of Outer Space (UNCOPUOS) would be an ideal environment for the creation and operation of such a system. UNCOPUOS is composed of eighty-seven geographically and economically diverse member States (including all the major space-faring States). Additionally, intergovernmental organizations and non-governmental organizations have observer status.142 Given its central mission to maintain space as a peaceful arena of international cooperation, as well as its representative composition,143 it would be an ideal body to bring a space leasing system to fruition. UNCOPUOS, in turn, should operationalize the leasing system by establishing a new International Outer Space Authority. This Outer Space Authority should parallel the International Seabed Authority described above.144 There should be similar provisions for the International Outer Space Authority relating to the makeup and functioning of the Authority (with each country getting one vote and decisions made by a two-thirds majority);145 the power of the Outer Space Authority to exercise control over space generally;146 the ability to decide how much rent to charge nations or individual corporations;147 and how to use these funds,148 among other provisions. For this proposed Outer Space Authority to be useful as well as operational, it is critical that it have jurisdiction over property rights in space beyond mining rights. Having rights to property in addition to rights to extracted minerals would add an extra layer of legal security for companies considering venturing into space for mining purposes. And, although businesses currently seem most interested in the possibilities of mining space resources, in the long term, questions of space tourism and the potential development of space colonies may arise. Having a flexible system in place that can adequately handle these concerns is therefore desirable. Instead of just focusing on mining, an Outer Space Authority with broader jurisdiction will have longer staying power and will require less reworking in the near future. Part of the appeal of this rental model is that it works so seamlessly with the current Outer Space Treaty. Turning again to the language of the Treaty and beginning with the non-appropriation principle, Article II lays out that “[o]uter 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.”149 Because no State or individual would ever own land in space under a leasing system, this proposed leasing regime would not be in contravention to Article II. And yet, despite this, a leasing regime would establish enough legal security that exploitation of space resources would not be impeded—the main rationale for those who argue that the Treaty (or at least Article II) should be rescinded. Moreover, the principle established in Article I of the Outer Space Treaty, that “[t]he exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind,” is also upheld under this leasing regime.150 Leasing not only allows nations and private companies to exploit space resources and reap the benefits of their labor, but also directly benefits developing countries not yet able to tap into the resources of space by redistributing some of the space-going nations’ profits via a leasing fee and a tax on extracted resources. A potential argument against this rental system, as well as any other international legal system that would seek to regulate property rights in space, is that the United States never signed on to UNCLOS and there is nothing different about this situation that would cause the United States to join an international treaty regulating property in space either. However, space law has a fairly different history than the law of the sea. These differences make it more likely (though unfortunately not certain) that a proposal for an International Outer Space Authority would be adopted by the United States despite the fact that the facially similar UNCLOS proposal failed to garner a two-thirds majority vote in the Senate. The major difference between UNCLOS and this proposed International Outer Space Authority is that the United States has self-interested reasons for supporting an International Outer Space Authority, whereas it did not have similar reasons to join UNCLOS. The United States has maintained that under customary international law, deep seabed mining is already permissible.151 Since the United States does not recognize limitations of deep seabed mining established in UNCLOS, it may legally undertake deep sea mining under customary international law—a right that is codified in domestic U.S. law in the Deep Seabed Hard Mineral Resources Act: [I]t is the legal opinion of the United States that exploration for and commercial recovery of hard mineral resources of the deep seabed are freedoms of the high seas subject to a duty of reasonable regard to the interests of other states in their exercise of those and other freedoms recognized by general principles of international law . . . .152 The United States therefore already has access to what it wants without having to join UNCLOS. As an additional point, there is also not much pressure from American companies to ratify UNCLOS, in part because the American Exclusive Economic Zone (recognized by the United States under customary international law)153 and the continental shelf is hugely rich in the resources companies might otherwise have hoped to gain by joining the Treaty and gaining access to minerals from deep sea mining in other areas. Finally, not only does the United States stand to gain very little by ratifying the Treaty, there is an argument that ratification would disadvantage the United States. Under UNCLOS, “coastal States are required to make payments to the International Seabed Authority based on a percentage of revenues derived from the exploitation of the resources found within the continental margin beyond two hundred miles from the coast.”154 Notably, customary international law creates no such obligation.155 In stark contrast to UNCLOS, the new rental system proposed would directly benefit the United States. Unlike with deep sea mining, the United States and its citizens currently are bound by a treaty that prohibits appropriation of space: the Outer Space Treaty. Unlike the UNCLOS analogy, the United States has already relinquished rights in this arena. Agreeing to a leasing amendment would expand the scope of its rights, not infringe upon them. Additionally, the United States does not have access to an outer space “exclusive economic zone” in the same way that it does for the sea. Without some sort of agreement, the United States simply may not legally appropriate any in situ property in outer space. One final consideration increases the likelihood that the United States would in fact become a signatory to an amendment to the Outer Space Treaty. Such an amendment would likely have the support of businesses, environmental groups, and the military, an unlikely combination of key constituencies that would help push an amended treaty forward. Businesses would advocate for the change because it would provide a clearer mechanism for establishing property rights.156 Environmental groups might push for the amendment’s ratification because of the environmental protections that could be included in such an agreement.157 Finally, the military would also likely be a proponent of the system because having access to property in space gives strategic advantages158 and because it is likely that certain Cold War-era concerns that prompted spacefaring nations to sign the original Outer Space Treaty remain relevant—most notably, concerns over the weaponization of space.159 CONCLUSION The brief history of outer space law since the adoption of the Outer Space Treaty in 1967 highlights the ease with which customary international law shifts in this arena. Despite an original broad interpretation of the non-appropriation principle during the Treaty’s drafting, customary international law has since carved out an exception to this principle for extracted space resources. A second shift could be similarly underway. Driven by economic incentives, States may reinterpret the non-appropriation principle to allow for private appropriation of space property. Currently, States have an incentive to cooperate to establish a new international agreement concerning the use of outer space because international law, as it is presently understood, prohibits private property rights in space. A new amendment could broaden these rights, providing an enticing carrot to encourage State cooperation. But this enticement may soon disappear. Given the flexibility of the current outer space legal regime, customary international law could easily shift to interpret the non-appropriation principle as allowing private appropriation of property in space. Whatever the international community decides is the optimal solution regarding outer space property rights, it is vital that action be taken now to preserve the principles advanced by the Outer Space Treaty, such as equitable access and peaceful use of outer space. As the original drafters of the Outer Space Treaty recognized, these principles are best protected through a formal agreement and not merely through customary international law, which is often driven by the most powerful States. Regardless of whether a rental system similar to the one described above is established or some other method is used, the international community will have to act quickly if it wants to maintain shared international control over space. Pursuing an amendment to the Treaty as described also provides certainty and timeliness, two elements that would likely appeal to constituencies that might otherwise be supposed to be content with waiting for customary international law to shift.

#### AT: Hickman 2 --- great, all I need to do is win one state!

#### AT: Van Fossen --- this is not a solvency card --- ilaw might be good, but that doesn’t mean leasing out slots is able to solve war --- all their advantage offense comes from megacons being launched into space --- if that still exists post-plan vote NEG on presumption