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#### Plan: The appropriation of outer space by private entities in The People's Republic of China is unjust.

## Advantage 1 is Debris

#### Chinese space commercialization uniquely risks collisions – they ignore norms and don’t register satellites which prevents tracking

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Of the 3,000-odd operational satellites currently in orbit, a little over 400 belong to China or Chinese companies. The number of commercial companies in the West launching satellites has skyrocketed in recent years, and SpaceX now operates more satellites than any other company or government. But refusing to be left behind, China is planning both state and commercial deployments of constellation satellites in huge numbers in the coming years, which could post an increased risk to in-orbit operations if Chinese companies don’t take due care in how they behave. The new commercial space race A report by the Secure World Foundation says a 2014 document from the Chinese Government known as “Document 60” (Official English Language Title: Guiding Opinions of the State Council on Innovating the Investment and Financing Mechanisms in Key Areas and Encouraging Social Investment) was the start of China’s modern commercial space sector. And in 2020, satellite Internet was included in the scope of China’s New Infrastructure policy initiative. Space is also part of China’s expansive Belt and Road initiative, which all combined have led to an explosion in the country’s commercial space ambitions. China is beginning to “get its act together” around commercial use of space, Jonathan McDowell of the Harvard-Smithsonian Center for Astrophysics tells DCD. Whereas in previous years he says China has had many government satellites and some quasi-commercial satellites with strong ties to government, but now there are true commercial Chinese companies in space. “We have the same phenomenon as the US companies in that they're moving fast and they're innovative and doing new things.” But as Chinese companies look to follow the likes of SpaceX and OneWeb in deploying large numbers of satellites, he warns their lack of care in operations could potentially damage space for everyone. China’s commercial space industry blasts off A number of private space companies including LinkSpace, OneSpace, iSpace, LandSpace, and ExPace, have all launched in recent years. As well developing their own rockets, these companies are launching satellites of all shapes and sizes into Low Earth Orbit (LEO) with the aim of forming their own constellations to rival those of Western companies. Bao Weimin, member of the National Committee of the Chinese People’s Political Consultative Conference and director of the Science and Technology Committee of the Aerospace Science and Technology Group, recently announced plans to establish a national satellite network company to be responsible for “coordinating the planning and operation of space satellite Internet network construction.” The China Aerospace Science and Industry Corporation (CASIC), a state-owned enterprise, outlined its plans to preliminarily finish the construction of the Xingyun project, an 80-satellite LEO narrowband Internet of Things constellation, by 2025 in addition to 320 Hongyan communications satellites. China Telecom’s satellite communications reportedly has plans to launch 10,000 satellites in the next five to ten years under the name ‘China StarNet’. Spacety is also launching a constellation of imagery satellites and has launched at least 20 so far. Another company called GW has filed for spectrum allocation from the International Telecommunication Union for two broadband constellations called GW-A59 and GW-2 that would include almost 13,000 satellites. A report from IDA into China’s commercial space industry found others including Zhuhai Orbita, GalaxySpace, MinoSpace, LaserFleet, Head Aerospace and numerous others are also developing constellations from which, like US counterparts, these companies aim to provide satellite broadband, 5G, IoT, and various data services. Though many are in the early stages of development, most plan to launch the first of what could be hundreds or even thousands of satellites within the next few years. While most companies can’t boast the same level of funding as US space companies – VC funding for Chinese space companies was up to $516 million in 2018 compared to the $2.2 billion US companies raised – they are bringing in investment; earlier this year Beijing Commsat received more than $4.5 billion in funding from the China Internet Investment fund, with more than $10 billion in additional funding promised in the future. Xie Tao, founder of Beijing Commsat Technology Development Co., Ltd, told China Money Network he expects the country to launch 30,000 to 40,000 Satellites in the future, compared to 40,000 to 60,000 launched by the US. “Space in the orbit is allocated on a first-come, first-served basis and the onus will be on these latecomers to ensure their satellites will not collide with existing ones,” Commsat’s Xie previously said. “The low-Earth orbit is becoming increasingly crowded and the space land grab is on.” China isn’t up to speed in orbital norms While the UN tightly controls GEO orbits, offering countries licenses for a set number of slots in the closely-packed and highly valuable planes, there is no such limit at lower orbits. The number of satellites that companies can launch at LEO is limited only by what local regulators will permit, despite the machines circling the entire planet in around 90 minutes. And space is becoming increasingly crowded. The number of satellites being launched annually is beginning to reach the thousands, leftovers parts from previous launches and satellites can mount up if not properly disposed of, and debris from previous in-orbit incidents means LEO is full of thousands of pieces of potentially satellite-destroying junk and debris. Around 28,200 pieces of space junk and debris are currently being tracked in orbit but ESA estimates there could be up to hundreds of thousands of potentially harmful pieces in orbit. At its most extreme, Kessler syndrome predicts a scenario where the space around Earth is so full of satellites and debris that it becomes unmanageable and collisions begin to cascade, causing a chain reaction of collisions which render many orbits out of use for generations. China has as much right to operate satellites as Western companies, but the current lack of adherence to ‘space norms’ could increase risks further. McDowell warns the ‘explosion’ of Chinese activity could have a massive impact on the usability of space.“Chinese adherence to things like space debris norms and registration norms is, I would say, about 10 years behind everybody else, if not more” he says. “In UN registration of satellites, they're being very incomplete. They're not registering a lot of their CubeSats and things like that. They're not really being as careful, and they're not as transparent in what's going on.” Chinese commercial satellites are subject the same risks as Western ones in space; extreme temperatures, crowded operating environment, and new companies seeing large numbers of failures as they go through rapid development. But a lack of proper registration can create more risk of collisions, which can have catastrophic effects, especially with larger satellites at higher orbits.

#### Clustering makes the risk of collisions uniquely high

Dr. Darren McKnight 17, Ph.D., Technical Director for Integrity Applications, Previously Senior Vice President and Director of Science and Technology Strategy at Science Applications International Corporation, “Proposed Series of Orbital Debris Remediation Activities,” 3rd International Conference and Exhibition on Satellite & Space Missions, 5/13/2017, https://iaaweb.org/iaa/Scientific%20Activity/debrisminutes03166.pdf [graphics omitted]

Secondly, while protecting operational satellites from the trackable population via collision warnings provides a quantifiable risk mitigation mission, the primary threat to operational spacecraft comes from the lethal nontrackable (LNT) environment that will produce the vast majority of the anomalies and failures examined by the activity just outlined. LNT debris ranges from about 5mm to 10cm; these are fragments that are large enough to disrupt and terminate a satellite’s mission upon impact but are too small to be cataloged. There is an estimated 500,000-700,000 LNT in LEO currently. Therefore, the cataloged population (~18,000 in LEO) that is evaded through active maneuvering is less than 5% of the lethal population. In the future, this population will be added to primarily from collisions between large objects in orbit as the number of LNT produced is proportional to the mass involved in a collision (or explosion).2 Cataloged debris produced from a catastrophic collision will be liberated at about 1-3 fragments per kilogram of mass involved while LNT production is around 10-40 fragments per kilogram of mass involved. The Iridium/Cosmos collision involved a total mass of 2,000kg and produced over 3,000 trackable fragments and likely 10,000-15,0003 LNT debris. The Feng-Yun purposeful collision yielded over 2,200 trackable fragments and likely over 30,000 LNT from only ~850kg of mass involved. While it is important to prevent these types of events from occurring in the future, the consequence of a collision (based on number of LNT produced) will be proportional to the mass involved in the collision. The term “mass involved” implies a good coupling of the impactor mass with the target mass. For a large fragment (e.g., several kilograms) striking a typical payload (that is densely built) in its main satellite body (vice striking a solar array or other appendage) at hypervelocity speeds (i.e., above 6km/s) will result in all the mass being “involved” in the debris. However, a large fragment striking a derelict rocket body, due to the way that the mass is concentrated at the ends of a rocket body, will likely not result in all of the mass being “involved” in the liberated debris. However, it is likely that when two large derelicts, either rocket bodies or payloads, collide with each other, then all of the mass will be involved due to the likely direct physical interaction between the mass. The table below summarizes the mass involvement scenarios which highlight why the massive-on-massive collisions are the focus of our analyses. Therefore, it is best to prevent the collision of the most massive objects with each other (higher consequence) and the ones that are the most likely (higher probability) since risk is probability multiplied by consequence. Our ability to model and predict the rate of collisions is based empirically upon only one catastrophic accidental collision event and a model developed on the kinetic theory of gases (KTG). However, clusters of massive objects that have identical inclinations plus similar and overlapping apogees/perigees may indeed have a greater probability of collision than predicted by the KTG-based algorithms as they are not randomly distributed and their orbital element evolution (e.g., change in right ascension of ascending node and argument of perigee) is also similar. It is hypothesized that these similarities could result in resonances of collision dynamics that may lead to larger probability of collision values than predicted with current algorithms. The not well-known fact is that many of the most massive objects are in tightly clumped clusters that will likely produce greater probability of collision than estimated by the KTG approach (see attached paper) and with the much larger consequence (i.e., creation of catalogued LNT fragments). The attached paper that studied this possibility shows some initial indications that this may indeed be true but much more analysis is needed to provide this conclusively. This table of clusters represents well over 50% of the total derelict mass in LEO. However, no one is currently monitoring these potential events. It is proposed that it would be a prudent risk management approach for space flight safety to monitor and characterize this inter-cluster collision risk. The Massive Collision Monitoring Activity (MCMA) is proposed whereby the encounters between members of these clusters are constantly monitored and close encounter information collected, plotted, analyzed, and shared. This would provide a rich research base for scientists and a predictive service for spacefaring countries. I am currently executing a subset of this proposed activity in an ad hoc fashion in conjunction with JSpOC. I have been monitoring the interaction dynamics between the SL-16 population in the 820- 865km altitude region for the last nine months.

#### 1] Debris cascades cause nuclear war – satellites are necessary to deterrence

Johnson 14 – Johnson, Les, 2014, “Living Without Satellites,” <https://www.baen.com/living_without_satellites> Les Johnson is a physicist, author, and NASA technologist. He is an elected member of the International Academy of Astronautics, a Fellow of the British Interplanetary Society and a member of the Science Fiction and Fantasy Writers of America, the National Space Society, and MENSA.

Months before, using computer simulations, the US Space Surveillance Network had predicted that these two satellites would collide. Sophisticated radars around the world kept constant watch on the myriad of objects now circling the Earth and equally sophisticated computer models predicted with high accuracy when such collisions were likely to occur. They got this one right. A team of engineers was watching the display and anxiously waiting on the radar results to provide an estimate of how bad the collision was. After just a few orbits, they had their preliminary answer – pretty bad. According to their models, the debris created in this latest collision was just enough to initiate the [Kessler Syndrome](http://en.wikipedia.org/wiki/Kessler_syndrome). The Kessler Syndrome, named after the engineer who predicted it, says there will be a time when there are enough pieces of debris in space to create a cascading series of collisions that may ultimately render Low Earth Orbit (LEO) unusable. Any satellite in LEO after that time will have a high probability of being hit by debris and destroyed. The team lead, with data in hand, contacted his superior and informed him of the latest predictions. Not wanting to be alarmist, his supervisor asked for more information, including when the next collision was likely to occur if predictions of a runaway Kessler Syndrome were accurate. The next impacts would occur in no more than six months. Time Zero Plus 6 Months The computer models were correct. Six months later, a two inch piece of aluminum, still traveling twenty times faster than a bullet, collided with a functioning Global Positioning System (GPS) satellite and destroyed it. The collision created another five thousand pieces of debris that quickly spread out into several different orbits. Shortly thereafter, yet another piece impacted a European science satellite, creating still more debris. The Kessler Syndrome had begun. Time Zero Plus 18 Months The six astronauts on the International Space Station were aware of the orbital debris problem. They’d learned about it during their extensive training and they had contingency plans in place should there be a debris threat to the 660,000 pound orbiting laboratory. Bigger than a football field, the station was a large target for debris. Fortunately, under normal circumstances, any debris object large enough to pose a serious threat to the space station was tracked on radar, allowing ample warning of any potential collision risk. In fact, the station performed adjustments to its orbit several times each year to reduce the likelihood of an impact with a closely passing piece of junk. But these were not normal circumstances. The astronauts had been warned of the potential runaway Kessler Syndrome and were in the process of abandoning ship and returning to Earth in the emergency crew escape vehicle when the entire station shuddered from a debris impact somewhere in the Destiny, America’s Laboratory Module. Fortunately, they were in the process of leaving and they were quickly able to get in the escape vehicle. Moments after they separated from the space station and began their return to Earth, the thirty billion dollars orbiting laboratory lost its entire atmosphere and began tumbling out of control. As in the movie Gravity, it, too, had now become a piece of space junk. Time Zero Plus 3 Years Ten satellites and the International Space Station were now lost and the number of collisions was increasing. The United States, Russia, and China were now on high military alert. Among the ten lost satellites were super-secret and super-sophisticated spy satellites. Since the Cold War, the world’s major nuclear powers had placed into space spy satellites capable of providing early warning of an attack. These satellites could detect the launch of an adversary’s missiles with sufficient time to trigger a punishing counter attack before the first hostile bomb could fall on one of their cities. The doctrine of Mutual Assured Destruction, or MAD, had worked to keep the peace for decades due to the vantage point provided by these eyes in the sky. As the satellites began to go down, defense planners got nervous and increased their state of readiness, regrettably also increasing the chance of a miscalculation causing a devastating war. In both the United States and in Russia, forces were placed on high alert. Fortunately, both countries maintained a significant array of radar installations that could detect missiles in flight shortly after launch. Without satellites, these radars would provide the only warning that an attack had begun. Not since the Cold War had either country’s nuclear forces been on such a high state of alert. Time Zero Plus 5 Years The total number of satellite collisions totaled over twenty-five. The world’s spacefaring nations were now acutely aware of the problem and working to find a solution. Unfortunately, any solution would require building a series of complex and expensive spacecraft to either remove large debris objects or de-orbit small ones. The first of the satellites to try and reverse the Kessler Syndrome would not be launched for another three years – the total number of damaged satellites at that time was projected to be near fifty… The disaster might play out very differently than the previous scenario. It might begin with a blast of radiation coming from the Sun impacting the Earth, zapping with spacecraft electronics and causing many of our satellites to die or become uncontrollable. It might also be caused deliberately, as an act of international terrorism, with a small country launching a rocket filled with ball bearings into an orbital region occupied by numerous commercial satellites, kickstarting the Kessler Syndrome. Any country with access to space can wreak all sorts of havoc on the largely fragile and unprotected satellites that freely circle the globe. There are already over half a million pieces of [debris](http://orbitaldebris.jsc.nasa.gov/faqs.html) in Earth orbit (Figure 1). Debris was probably placed in space with the launch of our first satellites in the late 1950s. Flecks of paint, screws and bolts from early rockets, bits of insulation, and even ice crystals discarded from orbiting space stations are among the debris that will likely remain in Earth orbit for thousands of years until their orbits naturally change and decay or until we go out and get them. Until recently, when a satellite was launched into space, no thought was given to what would happen to it after it completed its mission or ceased functioning. As a result, long-dead satellites are still out there, whizzing through space, becoming debris for some future satellite to crash into. Sometimes these old satellites still have residual propellant in pressurized onboard tanks or high energy batteries. Over time these tanks and batteries fail, causing a relatively large spacecraft to explode and create its own small debris cloud consisting of hundreds or thousands of pieces. Creating orbital debris wasn’t intentional; it happened due to a lack of foresight and planning. No matter the cause, once the cascade of collisions begins, the result may be the same: a debris cloud of increasing size will encircle the globe. The cloud will consist of thousands of debris objects, each traveling at over five miles per second. These objects will circle the globe every ninety minutes and on every orbit, each piece will have a small, but very real, probability of colliding with a functioning spacecraft. When these inevitable secondary collisions occur, more debris will be added to the cloud, increasing yet again the probability of future collisions. Like a nuclear chain reaction, the cascade of collisions will continue until the count of debris objects numbers in the millions. There are now nearly half a million pieces of debris with diameters of a few centimeters or more. Most of these objects are in orbits too high for them to naturally decay, enter the Earth’s atmosphere, and burn up. Once the cascade begins and the tipping point is crossed, no satellite will be completely safe. Is this inevitable? No. But unless we begin to take steps to clean up the existing debris, limit the creation of future debris, and harden our commercial satellites against extreme solar storms, then this frightening scenario may become a reality. Some may be wondering why I call this scenario “frightening.” After all, space is out there and we’re down here. How can the loss of space satellites, things that didn’t exist in any significant number until the 1960s, possibly have any meaningful impact on our lives here on Earth? Most people don’t realize how their lives are affected by space technology and space satellites. When they think of space exploration, they think of the International Space Station, Apollo and sending people to Mars. What they should also be thinking about are the Global Positioning System (GPS), communications satellites, spy satellites and weather forecasting – among many other things. GPS was developed first and foremost to support the needs of the U.S. military. It consists of a network of between 24 – 32 satellites that provide line-of-sight access for receivers on the ground from virtually any place on planet Earth. A receiver uses the signals from multiple satellites simultaneously, and the amount of time it took each signal to reach it (knowing that the signal travels at the speed of light), to calculate its position on the ground with very high accuracy. Since the early 1990s, GPS has allowed our armed forces to navigate and coordinate with precision unequaled in the history of warfare. GPS signals are used to navigate drones for reconnaissance and combat, soldiers on battlefields, ships at sea, and planes in the air. GPS allows precise navigation anywhere on the globe and under varied weather conditions including rain, fog and sand storms. A sudden loss of GPS for the modern warfighter would be akin to someone losing one of their primary senses – sight, sound, smell or touch. It would not necessarily be fatal, but it would certainly be debilitating. It is so useful that other countries are building their own systems so as to not be dependent upon the US should we decide to turn off GPS signals. After all, if we can use it, so can our adversaries. The Global Navigation Satellite System (GLONASS) is Russia’s answer to GPS. Europe is building and deploying their Galileo positioning system and countries like India and China are building their own regional systems to provide comparable capability under their own control. Who can blame them? Shortly after becoming operational, GPS entered the civilian economy like a tidal wave. Commercial electronics companies began selling portable GPS receivers for cars and trucks. Cell phone manufactures now have them embedded in virtually every cell phone produced. Google Maps changed the nature of mapping and how we travel, both in our cars and on foot. Local emergency personnel adopted the technology for E-911 services and for navigation. Cities have mapped the locations of fire hydrants and can direct emergency responders to the nearest one should the need arise. Have you ever heard of Positive Train Control? In 2008, the U.S. Congress mandated that the nation’s rail system use GPS tracking to improve safety and reduce the risk of accidental collisions. Our rail system, which moves goods across the continent, is now dependent on GPS to function. And, as goes the rail system, so go the airlines. By 2025, U.S. air traffic control will move from ground-based beacons to space-based GPS tracking and navigation. Touted to increase the efficiency of air travel, with ever-increasing number of commercial airline flights, the Next Generation Air Transportation System will also be dependent upon satellites for routing planes and handling the complex traffic control near the nation’s airports. Ships at sea already use GPS for navigation, with the thousands of cargo ships carrying everything from cars and electronics to food and diapers moving from country to country as international trade becomes increasingly globalized. Few countries make all the goods their citizens need within their own borders and GPS is one of the technologies that helped make massive international trade affordable. The retail industry has embraced GPS for moving goods in a timely manner from warehouses to store shelves. Knowing where a particular shipment is located on its journey allows just in time manufacturing and inventory control, reducing costs and warehousing expenses. Retail companies also makes use of satellite technology in other ways. Credit card companies often use secure satellite links for card and check approvals at retail stores, bypassing the increasingly insecure Internet for transmitting financial data. The satellite dishes on the roofs of your favorite stores are not there for employees to watch DirecTV in the break room. They are likely VSAT (Very Small Aperture Terminal) antennas that are humming with the financial and inventory data needed for the store to keep its doors open and its shelves stocked. Some banks now use VSATs to transfer funds from one to the other, making them a part of the global financial infrastructure. Cable television doesn’t originate at your local cable company and then get piped into your home. Instead, the myriad of channels conveniently aggregated into whatever bundle to which you happen to subscribe come to your local cable provider by satellite relay. Without satellites, news of what’s happening in Russia, China and other parts of the globe cannot otherwise make it into the daily newsfeed. Your favorite football team playing a game in another state this Monday night likely cannot be broadcast without going through a satellite relay. If our communications satellites are lost, your televisions and, to the extent that they play to a national audience, your radios, will become purveyors of only what’s happening locally. We shouldn’t forget weather forecasting. A network of satellites provides critical data for forecasting the weather, particularly the outlook for several days in the future. Figure 2 shows a satellite image of Hurricane Ivan approaching Alabama’s gulf coast in 2004. This type of data saves lives and, almost as importantly, helps people and businesses determine if they are in the path of a storm and how to react appropriately. The vantage point of space allows the precise evacuation of the communities likely to be most affected and those that are not in the line of fire to know that they can remain in place, saving lives and millions of dollars. Satellite imagery is used by the military and our political leaders to maintain the peace. When your potential adversaries can’t hide what they’re doing, where their armies are moving and what they are doing with their civilian and military infrastructure, then the danger of surprise attack is diminished. In our nuclear age with instant death only minutes away by missile attack, the doctrine of Mutual Assured Destruction (MAD) only works if both sides know whether or not they are being attacked. The launch of missiles or a bomber fleet can easily be seen from space far in advance of either reaching their potential targets halfway around the globe. The danger of surprise attack is therefore small, making an accidental war far less likely. So what does all this mean? And what do we do about it? First of all, it means that the advocates of space development, exploration and commercialization have succeeded far beyond their initial expectations and dreams. The economies and security of countries in the developed world are now dependent on space satellites. We space advocates should celebrate our success and be terrified of it at the same time. Should we lose these fragile assets in space, our economy would experience a disruption like no other: ship, air and train travel would stop and only restart/operate in a much-reduced capacity for years (GPS loss). Many banking and retail transactions would cease (VSAT loss). Distribution of news and vital national information would be crippled (communications satellite loss). Lives would be put at risk and the productivity of our farming would dramatically decrease (weather satellite loss). The risk of war, including nuclear war, would increase (loss of spy satellites) and our military’s ability to react to crises would be significantly reduced (loss of military logistics and intelligence gathering satellites).

#### 2] Nuclear debris will contaminate the Earth

Loren Feffer 2, and Adi Ferrera, “Does the Accumulation of “Space Debris” in Earth’s Orbit Post a Significant Threat to Humans, In Space and On the Ground”, Science in Dispute, Vol. 1, http://issuu.com/elsachung/docs/spacejunk

Those who fear that space debris poses an imminent threat argue that the uncertainty surrounding the dangers of space debris is reason enough to proceed with the greatest of caution. Rather than draw comfort from the absence of any catastrophic collisions during the first four decades of space exploration, they point to a collection of observations of minor to moderate impacts as a warning sign of potential disaster. Although serious damage has been avoided, space debris has fallen in and near populated areas, injured people, killed livestock, damaged terrestrial structures, and caused observable damage to satellites and space vehicles. Any increase in space-based technology could easily lead to an increase in such events, with an accompanying threat of more serious consequences. Perhaps the greatest worry associated with space debris comes from the possibility that highly toxic nuclear and chemical fuels used in space vehicles could re-enter Earth's atmosphere and contaminate a populated area. —LOREN BUTLER FEFFER Page 17 | Top of Article Viewpoint: Yes, the probability of collisions between operational spacecrafts (including satellites) or between spacecraft and existing debris is increasing, and the presence of nuclear-powered spacecraft makes any collision potentially disastrous. The biggest problem with "space debris," also referred to as orbital debris, is that no one knows for sure how to predict the risk they present. The official word is that the chances of human casualties as a result of orbiting or reentering debris are (currently) small. These statistics are arrived at using modeling techniques based on current trends and conditions, both on Earth and in space. The models are subject to change as trends change and knowledge expands. According to NASA itself, the growth in amount of debris poses a "rapidly increasing hazard." A close inspection of our space age to date reveals many close calls and potential catastrophes. Most of them were averted as a result of plain luck, rather than engineering virtues. Dangers of Space Debris The U.S. Space Command tracks more than 8,000 orbiting objects larger than 4 in (10 cm), of which only 7% are operational. The rest are debris—dead satellites, parts of exploded rockets, nuts, bolts, other lost hardware, etc. Most orbital debris is found in Low Earth Orbit (LEO), in altitudes below 1,243 mi (2,000 km). At these altitudes, objects collide at a speed of 6.2 mi per second (10 km/sec). In such velocities, even very small objects can inflict serious damage. It is estimated that smaller, non-tracked debris number in the millions. How much damage can an object smaller than 4 inches inflict in space? NASA documented a cracked space shuttle window from an impact with a paint chip estimated to be 0.008 in (0.2 mm) in diameter. Larger debris could cause damage up to and including a complete breakup of the spacecraft. And if a paint chip, which can't be tracked from the ground, cracked a space shuttle window, imagine what it would do to an astronaut out on a space walk. Space shuttle windows are replaced after many missions—the result of impact damage. The size of the debris is not the only factor in the risk to space missions and the personnel aboard. In a 1997 report, NASA scientists pointed out that a single component failure due to a collision with debris could have repercussions ranging from simply functional—limited to that component without affecting the mission or craft—to catastrophic. The hypothetical example cited in the report is a perforation of an air-tank stored outside the manned module of a space station. In a worst-case scenario, the perforation could cause a pressure change in the tank that is strong enough to thrust the space station to an altitude from which orbit can't be recovered, resulting in a catastrophic failure of the space station. It will be dragged into Earth's atmosphere, where it will break up. No doubt human lives will then be at significant risk, if not lost. With the amount and sizes of debris near the space station, this scenario is not far fetched. According to the NASA report, the chances of collision increase with the size of the object and the longer it stays in orbit. The International Space Station (ISS) is very large, and is meant to stay in space for at least 10 years. Arguably many improvements and better detection systems have been implemented on the shuttle and the ISS. But in a 1999 congressional testimony, Professor Stephen A. Book, member of the National Research Council's Committee on Space Shuttle Upgrades, had this to say about proposed upgrades aimed at protecting the shuttle from orbital debris: "Considering the predicted high level of risk from this hazard even after these modifications are made, the space shuttle upgrades program should solicit additional upgrade proposals for protecting the shuttle from meteoroids and orbital debris." And we must keep in mind that when people and machinery interact, even if protective measures are in place, the unexpected sometimes happens. In June 1999, the Air Force notified NASA that an old Russian rocket was going to pass too close to the then-empty ISS. A course alteration command that was sent to the station's computers was faulty, and the onboard computers shut ground controllers out of the steering system for 90 minutes, by which time it was too late to change course. As luck would have it, the rocket Page 18 | Top of Article Orbital debris in Saudi Arabia. (NASA, Lyndon B. Johnson Space Center. Reproduced by permission.) View PDF passed much further from the station than initially anticipated. A favorable miscalculation, but nevertheless it illuminates the unpredictability of space debris and our lack of reliable knowledge about them. Speaking to ABC News about the steering problem, James Van Laak, then deputy manager of space station operations, said, "This is just the first of many opportunities to be humble, and I hope that everyone will keep in mind that we're learning as fast as anybody." Can we afford this learning curve when astronauts are in the station, or in the shuttle? When people rely on machinery to protect them in space, or trust not to fall on them from the sky, we must also ask ourselves how reliable the machinery really is. Shuttles, space stations, rockets, and satellites are only as good as their human designers and engineers, who may underestimate existing dangers during design and review stages. When Thiokol engineers sought to redesign the space shuttle O-ring, for safety reasons, NASA cut off funding, saying that the current design was good enough. Then came the Challenger disaster, and seven lives were lost. The official inquiry report cited poor O-ring design as a contributing factor in that tragedy. Mother nature itself often foils even our best plans and protection measures. NASA's Skylab is a prime example. The hefty, expensive research facility was supposed to be refurbished by NASA after being boosted to a higher orbit. What no one at the time thought to consider was the increased activity of the Sun. The result of this increase was an expansion of our atmospheric region, which served to change Skylab's orbit. The orbit decayed rapidly, catching NASA unprepared. In the end, all that was left to try was to change the re-entry orbit so that it would hopefully pass over non-populated areas. These attempts failed. While many pieces of Skylab splashed into the ocean, plenty of pieces ended up on the ground, in Australia. In his book, Collision Earth! British astronomer Peter Grego recalls, "Ranchers in sparsely populated Western Australia found their estates strewn with hundreds of melted, twisted metallic fragments." The largest piece recovered was a 2.3-ton "fragment." One cow was reportedly killed by falling debris. Robert A. Frosch, who was NASA's administrator at the time Skylab crashed, was quoted as saying that he would rather look at chicken entrails than try to predict solar activity. Apparently he was right. On February 7, 1991, the Soviet space station Salyut 7 fell back to Earth as a result of increased solar activity. This time the people of Capitan Bermudez, Argentina, were the lucky ones, as once again debris littered a populated area. Attempts to change the reentry path were, once again, unsuccessful. Falling Debris and Exposure to Radioactivity Risks posed by orbital debris to people on the ground aren't limited to the heavy, twisted chunks of metal that fail to burn on reentry and Page 19 | Top of Article fall from the sky. What very few people consider are the substances carried inside the various spacecrafts and rockets. Many times, these substances fall back to Earth. On January 24, 1978, after suffering a technical malfunction onboard, the Soviet satellite Cosmos 954 disintegrated over the Northern Territories in Canada. Scattered across a vast area were thousands of radioactive particles, pieces of the satellite's nuclear power core that survived reentry. The Soviets were unable to predict where Cosmos 954 might fall—they estimated somewhere between Hawaii and Africa; nor were they able to alter the satellite's flight path on reentry. Over 60 nuclear devices were launched into orbit so far. NASA will launch three more missions involving nuclear-powered crafts in the coming years. The army isn't saying much, but nuclear militarization of space is a known trend and an ongoing debate. What happens if a nuclear space rocket is hit by space debris? Nine nuclear spacecrafts have fallen back to Earth, so far. The Cosmos 954 incident was the worst one, and in fairness, some cores were never breached. But of the nuclear-powered spacecraft that fell to Earth, some released measurable radioactivity into the atmosphere. How do we know what effect the release of radioactivity into our atmosphere had on our health? Can we be sure that the next nuclear-powered craft that falls to Earth will once again miss a populated area, and that its core won't be breached?

#### Extinction

Joseph Gutheinz 5, Former Senior Special Agent – NASA Office of Inspector and JD, “NASA’s Plutonium Gamble”, http://www.paranoiamagazine.com/plutogamble.html

Nukes in Space The Cassini-Huygens mission is a joint project of NASA and the European Space Agency (ESA) to explore Saturn and its moons. Launched in October 1997 and powered by 72.3 pounds of plutonium-238, Cassini circled the entire Earth only 312 miles above our heads. The 1999 Cassini "fly-by" heightened fears of an "inadvertent reentry" that could have dosed Earth's entire population. Dr. Helen Caldicott, of Physicians for Social Responsibility, explains that less than 1 millionth of a gram of plutonium is a carcinogenic dose. One pound, if uniformly distributed, could induce lung cancer in every person on Earth. These physicians believe NASA's plutonium accidents are responsible for a worldwide increase in cancer rates since that time. (see Grossman) Dr. Michio Kaku says NASA's environmental impact studies underestimated the possible risks of the Cassini mission. He notes that NASA's studies appeared as though accurate calculations had been made, but in reality "no full-scale test of any realistic accident scenario has ever been carried out." Rates of uncertainty cannot be calculated, he concludes, because NASA's numbers are all "educated guesses." NASA's facts and figures are assumed to be correct and are not to be questioned. NASA claimed that solar power wouldn't work for Cassini because the probe would be too far from the sun. NASA had also claimed the Galileo mission had no other alternative than nuclear power. Weeks after its launch, a JPL study showed that Galileo could have used solar power without impacting its objectives. Physicist Carla Signorini stated in 1995, "If given the money to do the work, within five years [ESA] could have solar cells ready to power a space mission to Saturn." Yet, NASA and ESA still use nuclear fuel on deep space missions because the budgets for solar power systems are "a grain of sand from the huge bucket in which nuclear research is funded." Many now believe that NASA is motivated more by a desire for military funding, and that plutonium fueled space missions will indirectly aid public acceptance of the nuclear weaponization of space. Against the Outer Space Treaty of 1967, NASA's $3 billion Project Prometheus program will place nuclear reactors on the moon from where it will launch atomic-propelled rockets.

#### 3] Loss of satellites crushes global fisheries

Les Johnson 13, Deputy Manager for NASA's Advanced Concepts Office at the Marshall Space Flight Center, Co-Investigator for the JAXA T-Rex Space Tether Experiment and PI of NASA's ProSEDS Experiment, Master's Degree in Physics from Vanderbilt University, Popular Science Writer, and NASA Technologist, Frequent Contributor to the Journal of the British Interplanetary Sodety and Member of the American Institute of Aeronautics and Astronautics, National Space Society, the World Future Society, and MENSA, Sky Alert!: When Satellites Fail, p. 65-66

The Fishing Industry Fishing is one of the oldest industries in the world and it has gone high-tech. Ships no longer leave port for parts unknown, hoping to catch fish and bring them home to the local fish market for sale. Fleets of ships now go to sea, carefully navigating to assure that they remain in areas approved for fishing by the world's governments, catching only the numbers they are approved to catch, and following the prevailing market conditions that will determine when and where their catch is delivered for sale and processing on the way to your local supermarket shelves. For example, European fishing ships are required to register and report their voyages electronically, apprising government regulators of where they fish, and what and how much they catch. The two most common approaches used by fisherman to meet these regulations are Iridium-based satellite phones and VSAT terminals aboard ship. In addition to complying with regulators, fishermen now use these systems to get weather information and fuel costs and to find out at what port they can get the best prices for their catch. And, yes, most fishing ships now use GPS for navigation as well. Satellite remote sensing, using scientific data collected from space satellites looking at the world's oceans, has increased fishing productivity and is helping to prevent over-fishing in selected areas. Near-real-time pictures from space, combined with GPS, can help fishing vessels locate schools of fish [6]. As a specific example, to determine the best place to go for a day's catch, fishing fleets use satellite-determined ocean temperatures, which have been correlated over time with the location of schools of tuna. With modern technology at their fingertips, fishermen can precisely determine where the fish are located and navigate to them so as to catch as many fish as possible. Without these data, the enterprise becomes much less productive, resulting in far fewer fish being caught and a dramatic reduction in commercially available fish and fish products. This multi-billion-dollar industry has been transformed by satellite technology and our diets, as well as the industry itself, would suffer greatly if the fishing industry's productivity were to be slashed by the loss of these vital tools. The impact on the global economy from a reduction in fishing production would be widespread. Not only would there be fewer fish in the grocery store, but restaurants would suffer immensely. Just one species, the pollock, is widely used by fast-food chains like McDonalds to make their fish sandwiches and by other companies in their frozen fish meals. Consumers are buying fish oil supplements at an accelerating rate and all of the businesses associated with this depend upon more fish being caught each year. Without satellites, there is simply no way we could maintain current production levels, let alone increase them.

#### Fish wars - nuclear war

Dr. Julian Cribb 16, Adjunct Professor of Science Communication at the University of Technology Sydney and Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE), Principal of Julian Cribb & Associates, “Surviving the 21st Century: Humanity's Ten Great Challenges and How We Can Overcome Them”, p. 74-75

In 1999 the Oslo Peace Research Institute issued a ground-breaking paper by Indra de Soysa and Nils Gleditsch which drew attention to the fact that, in the first decade of the post-Cold War era, most conflicts began with develop- ment failure and contests between the different players over those fundamen- tal resources for life: food, land and water. “The new internal wars, extremely bloody in terms of civilian casualties, reflect subsistence crises and are largely apolitical,” they said (De Soya and Gleditsch 1999). This represented a chal- lenge to the long-held academic view that scarcity is a product of war—rather than war a being product of scarcity. In fact, humans have always contested key resources vi et armis—and politics, religion, patriotism and ethnicity are just the way we tend to marshal ourselves into opposing groups around them. Peter Gleick’s work on water conflicts lends substance to the warnings of two UN chiefs, Boutros Boutros-Ghali and Ban Ki-Moon, of the increased danger of wars breaking out over this indispensable resource as scarcity takes hold. ‘Food wars’ (including so-called ‘fish wars’) have erupted on numerous occasions in Africa—where the Rwandan genocide and drawn-out bloody con- flicts in Darfur and the Horn of Africa are particular examples—but also in Central America and Asia (Messer et al. 1998). These fights are almost always over the fundamentals of human survival and tend to originate as civil conflicts, which then spiral out of control to embroil neighbour states and even the superpowers. In the emerging era of resource instability, described in Chap. 3, the risk of war is liable to increase in proportion to the scarcity of essential resources, be they water, farm land, food itself, oil, gas or strategic minerals. The possibiity that some of these conflicts will involve the discharge of chemical, biological or nuclear weapons cannot be discounted. For example, in their Age of Consequences report, Kurt Campbell and colleagues at the US Center for Strategic and International Studies (CSIS) foreshadowed that with the famines and global disruption arising out of severe climate change (2.6 °C, in their sce- nario) “It is clear that even nuclear war cannot be excluded as a political consequence. Moreover, so-called “limited nuclear war” in any part of the world can escalate to a full-scale nuclear exchange among the big nuclear powers.” With catastrophic change of 5° or more, “The probability of conflict between two destabilized nuclear powers would seem high.” Furthermore “Armed conflict between nations over resources and even territory, such as the Nile and tributaries, is likely, and nuclear war is possible” (Campbell et al. 2007).

## Advantage 2 is Hegemony

#### Xi commitments, manufacturing capacity, and FDI make the Chinese private sector integral to Chinese space competition

Patel 21 — (Neel V. Patel, Neel is the space reporter for MIT Technology Review, and he writes The Airlock newsletter. Before joining, he worked as a freelance science and technology journalist, contributing stories to Popular Science, The Daily Beast, Slate, Wired, the Verge, and elsewhere. Prior to that, he was an associate editor for Inverse, where he grew and led the website’s space coverage., “China’s surging private space industry is out to challenge the US“, MIT Technology Review, 1-21-2021, Available Online at https://www.technologyreview.com/2021/01/21/1016513/china-private-commercial-space-industry-dominance, accessed 1-11-2022, HKR-AR)

Until recently, China’s space activity has been overwhelmingly dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC). A few private space firms have been allowed to operate in the country for a while: for example, there’s the China Great Wall Industry Corporation Limited (in reality a subsidiary of CASC), which has provided commercial launches since it was established in 1980. But for the most part, China’s commercial space industry has been nonexistent. Satellites were expensive to build and launch, and they were too heavy and large for anything but the biggest rockets to actually deliver to orbit. The costs involved were too much for anything but national budgets to handle. That all changed this past decade as the costs of making satellites and launching rockets plunged. In 2014, a year after Xi Jinping took over as the new leader of China, the Chinese government decided to treat civil space development as a key area of innovation, as it had already begun doing with AI and solar power. It issued a policy directive called Document 60 that year to enable large private investment in companies interested in participating in the space industry. “Xi’s goal was that if China has to become a critical player in technology, including in civil space and aerospace, it was critical to develop a space ecosystem that includes the private sector,” says Namrata Goswami, a geopolitics expert based in Montgomery, Alabama, who’s been studying China’s space program for many years. “He was taking a cue from the American private sector to encourage innovation from a talent pool that extended beyond state-funded organizations.” As a result, there are now 78 commercial space companies operating in China, according to a 2019 report by the Institute for Defense Analyses. More than half have been founded since 2014, and the vast majority focus on satellite manufacturing and launch services. For example, Galactic Energy, founded in February 2018, is building its Ceres rocket to offer rapid launch service for single payloads, while its Pallas rocket is being built to deploy entire constellations. Rival company i-Space, formed in 2016, became the first commercial Chinese company to make it to space with its Hyperbola-1 in July 2019. It wants to pursue reusable first-stage boosters that can land vertically, like those from SpaceX. So does LinkSpace (founded in 2014), although it also hopes to use rockets to deliver packages from one terrestrial location to another. Spacety, founded in 2016, wants to turn around customer orders to build and launch its small satellites in just six months. In December it launched a miniaturized version of a satellite that uses 2D radar images to build 3D reconstructions of terrestrial landscapes. Weeks later, it released the first images taken by the satellite, Hisea-1, featuring three-meter resolution. Spacety wants to launch a constellation of these satellites to offer high-quality imaging at low cost. To a large extent, China is following the same blueprint drawn up by the US: using government contracts and subsidies to give these companies a foot up. US firms like SpaceX benefited greatly from NASA contracts that paid out millions to build and test rockets and space vehicles for delivering cargo to the International Space Station. With that experience under its belt, SpaceX was able to attract more customers with greater confidence. Venture capital is another tried-and-true route. The IDA report estimates that VC funding for Chinese space companies was up to $516 million in 2018—far shy of the $2.2 billion American companies raised, but nothing to scoff at for an industry that really only began seven years ago. At least 42 companies had no known government funding. And much of the government support these companies do receive doesn’t have a federal origin, but a provincial one. “[These companies] are drawing high-tech development to these local communities,” says Hines. “And in return, they’re given more autonomy by the local government.” While most have headquarters in Beijing, many keep facilities in Shenzhen, Chongqing, and other areas that might draw talent from local universities. There’s also one advantage specific to China: manufacturing. “What is the best country to trust for manufacturing needs?” asks James Zheng, the CEO of Spacety’s Luxembourg headquarters. “It’s China. It’s the manufacturing center of the world.” Zheng believes the country is in a better position than any other to take advantage of the space industry’s new need for mass production of satellites and rockets alike. Making friends The most critical strategic reason to encourage a private space sector is to create opportunities for international collaboration—particularly to attract customers wary of being seen to mix with the Chinese government. (US agencies and government contractors, for example, are barred from working with any groups the regime funds.) Document 60 and others issued by China’s National Development and Reform Commission were aimed not just at promoting technological innovation, but also at drawing in foreign investment and maximizing a customer base beyond Chinese borders. **“China realizes there are certain things they cannot get on their own,”** says Frans von der Dunk, a space policy expert at the University of Nebraska–Lincoln. Chinese companies like LandSpace and MinoSpace have worked to accrue funding through foreign investment, escaping dependence on state subsidies. And by avoiding state funding, a company can also avoid an array of restrictions on what it can and can’t do (such as constraints on talking with the media). Foreign investment also makes it easier to compete on a global scale: you’re taking on clients around the world, launching from other countries, and bringing talent from outside China.

#### China will long-term outpace the US in space – mining, first-mover advantage, lunar projects

Fabian 21 — (Chris Fabian, Capt. Chris Fabian, U.S. Space Force, is a crew commander in the 3rd Space Operations Squadron supporting the Delta 9 mission. , “A call to action for strategic space competition with China“, TheHill, 6-22-2021, Available Online at https://thehill.com/opinion/national-security/558979-a-call-to-action-for-strategic-space-competition-with-china?rl=1, accessed 1-12-2022, HKR-AR)

To compete with China’s space power, the United States needs ambitious visions, not business as usual. China aims to be a dominant space power by 2045, raising concerns that it seeks to establish itself as a space hegemon. The meteoric rise of China’s space program and its lofty ambitions could result in China outpacing the United States in space. China understands that a vibrant space industry is critical infrastructure for economic development, would achieve potent soft-power effects, and provide vital capabilities to Chinese national security and economic development. China sent its first astronaut into orbit in 2003, yet in 2018 conducted more space-oriented operations than any other nation. Last December, China landed on the moon, planted its flag, collected moon rock samples, returned to Earth, and plans to install a permanent lunar space station by 2031. Months after China reached Mars’ orbit, its Zhurong rover landed on the red planet surface in May. China has begun talks with Russia to secure partnership for a lunar base project. Between 2036-2045, China plans to have a long-term human presence at the Lunar South Pole. These are amazing accomplishments and an ambitious vision for a nation that launched its first satellite only recently, in 1970. China’s space diplomacy and science efforts are biased toward exploring and exploiting natural resources in near-Earth objects and on the moon. China’s behavior in space may mirror its patterns of resource nationalism on Earth — that is to say, spending incredible political and economic capital to secure exclusive access to strategic resources. As Earth-based resources become scarce and technology makes space-mining feasible, space will become a frontier for strategic competition, especially resource nationalism. Mining even a single asteroid could disrupt global iron, nickel, platinum group metals (PGM) and precious metal-based economies, markets and industry supply chains, especially if controlled by a single state and used for in situ manufacturing and re-supply. Establishing a presence in cislunar space, as China clearly intends, provides capabilities and capacity for space mining, positioning, navigation and timing (PNT), and first-mover locational advantages for space settlement. This emerging competition differs from the Cold War-era race for symbolic space milestones that sought to prove the superiority of the U.S. market-based economic system for the benefit of unaligned nations. Today’s space race is about the actual economics of space-derived capabilities, access to space resources, and the technologies for acquiring and controlling them. The United States is at a crossroads: It can either prepare itself for this new paradigm, or be relegated to second-class status and look back on what could have been. Efficient and advantageous strategic investment now is better than doubling down later with a patchwork of expensive, rushed space programs.

#### NEA scarcity and ilaw ambiguity makes US-China space competition inevitable

Gautel 21 — (Gidon Gautel is currently an Analyst in the space industry. He was previously the Project Coordinator of China Foresight and Project Manager of the Economic Diplomacy Commission at LSE IDEAS. Gidon holds a BSc in Government and Economics with first class honours from the London School of Economics & Political Science, and an MSc in Innovation, Entrepreneurship & Management with distinction from Imperial College Business School., [insert quals], “Coordination Failure: Risks of US-China competition in space“, Medium, 4-29-2021, Available Online at https://lseideas.medium.com/coordination-failure-risks-of-us-china-competition-in-space-7112ca4f4da1, accessed 1-12-2022, HKR-AR)

Finally, a lack of coordination increases the risks for lunar crewmembers, once these arrive on the moon. The disruptions of the kind described above should be self-explanatory in their risk to humans attempting to establish a permanent presence. However, more insidious factors also abound. One of these is the lack of standardisation driven by a bifurcation into geopolitical blocs of lunar activity. As has been pointed out, widely adopted standards of lunar exploration promise considerable benefits[16]. A balkanisation of standards would do the opposite, limiting any attempt of future cooperation in exploration and scientific endeavour. In the most extreme cases, it endangers lives. Mutual aid is a core tenet of both the Outer Space Treaty and the Artemis Accords. Yet, a lack of universally accepted technological standards for lunar (and beyond) crewed operations potentially makes such action considerably more difficult. As the ISS has proven, any inter-operational system must be designed from the outset to be inter-operational. For future lunar activities, this presently seems impossible. Though currently remote, the possibility of the loss of life due to conflicting standards of crewed lunar technology is nevertheless a tragedy worth contemplating. Again, the described issues are most likely to occur should terrestrial geopolitical tensions between the US and China preclude proactive coordination and information sharing. While the establishment of separate lunar operations can, at this point, be taken as a given, it is far from too late to establish functionally sufficient coordination mechanisms to prevent a major international incident. While US-China coordination is limited by the Wolf Amendment, it is not wholly precluded, as indicated by NASA’s monitoring of the Chang’e 4 mission, utilising the Lunar Reconnaissance Orbiter[17], and, more recently, an exchange of data to mitigate the risks of an orbital collision of Mars orbiters[18]. Ideally, therefore, the United States would proactively take the necessary bilateral steps to work with China to coordinate its respective beyond-Earth surface activities and prevent harmful interference. Alongside, and regardless of, these efforts, it will be the task of members of international bodies, such as The Committee on the Peaceful Uses of Outer Space (COPUOS) to facilitate coordination activities. In the midst of such efforts, ESA member states are primary actors eligible for leading such initiatives, with ESA having engaged in collaborative activities in space with both the US and China. While diplomats active within UN COPUOS will be well aware of these issues, and their role in enabling such necessary coordination, it is incumbent upon national governments allied to the US to recognise these flashpoints and spearhead broader policy responses to proactively support coordination and the activities of their diplomats at the UN. The UK government, whose diplomats already play a major role in coordinating international space activities, must lend them its full support. Beyond the moon, the issue of geographically concentrated sites of interest is only likely to prevail. While space is boundless, areas of economical or scientific value are nonetheless often concentrated. Some preliminary analysis, for example, places the number of economically viable near-Earth asteroids at around only ten[19], due to the fact that metallic, accessible, and economically viable near-Earth asteroids are comparatively rare in number. Given the considerable geographic challenges associated with on-asteroid operations, the need for multi-actor coordination will only become more pressing, especially if terrestrial US-China competition intensifies. Failures to Coordinate The risks outlined above are non-exhaustive, and do not touch upon the military dimension of space which carries equal if not greater weight. However, they demonstrate clearly the fact that US-China coordination in space will become ever more pressing as the exploration and commercialisation of space advances. Such risks will only manifest themselves if the US and China are unable to coordinate their activities sufficiently and allow geopolitical tensions to obstruct this crucial work. Looking forwards, all third-party actors in space should closely monitor terrestrial US-China relations and map these to their own activities relating to space (be this in the realm of space exploration or applications), taking mitigating measures as necessary should tensions spill over beyond Earth. In tandem, states with notable diplomatic influence should increase further efforts to enable frictionless coordination and information sharing between the two great powers. Crucially, should formal coordination mechanisms in orbit, on the moon, or beyond be in sight, imperfect coordination should be prioritised if institutional gridlock driven by the pursuit of national interest is the alternative.

#### Space competition determines hegemonic power on Earth–it’s only a question of who wins the race.

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The strategic competition between the U.S. and China is fierce even in space outside of the earth. What do the two countries compete for in space? What are their objectives and what strategic calculations did they start from? Will the space race between the two countries lead to competition over space hegemony? This is one of the most interesting issues for U.S.-China observers in recent days. The space race between the U.S. and China is not just a number fight. How many satellites and spaceships have been launched and how many space stations have been established are the questions that mattered in the past. These mattered for the convenience and benefit for mankind. It could also make possible for some of the curiosity about the universe to be solved. However, starting the 21st century, the space race between the U.S. and China has progressed into an intense, high-level strategic battle. Whoever rules space rules the futureThere is one reason why thetwo countries' space strategy competition will inevitably lead to a hegemony competition. This is because they try to conquer the space order. Conquering the space order is to define and establish the space order. Those who dominate space will dominate almost all sectors of the future world, including economy, technology, environment, cyberspace, transportation and energy. That's why the United States is considered as a hegemonic country on Earth today. The U.S. is recognized as a hegemonic country because it establishes and leads the economic, financial, trade, political, and diplomatic order**.** There are two areas in the world today where international order has not been established. One is virtual space, which is the cyber world. The other is the space. Since the international order of these two areas is closely correlated with each other, it is likely that the establishment of the order in these two areas will be pursued simultaneously. This means that cyber order cannot be discussed without discussing satellite issues. The Communist Party of China recognized this early on. At the 19th National Communist Party Congress in 2017, it expressed its justification for establishing space order. President Xi Jinping declared that China's diplomatic stage in the 21st century has expanded beyond the Earth into space and virtual space. It was the moment when China defined the concept of diplomatic space as the "universe" beyond the Earth. He then explained that the establishment of a system that can even manage the order of the universe and the virtual world eventually means the establishment of practical governance. Therefore, he justified that China's diplomatic horizon has no choice but to expand into space. Furthermore, he stressed that he is confident that the ideation of building such governance serves as the foundation for the community of common destiny for mankind which China pursues. In other words, he publicly urged China to have the capabilities and means to become a key country in building governance in these two areas. This led the Trump administration to spare no effort to develop space science and technology and space projects, which are the basis of space order. Since President George W. Bush, the maintenance work for supremacy in space has been carried out. President Obama also introduced a policy to encourage U.S. private companies to participate in space projects to expand the foundation for supremacy in space. It was President Trump who actualized all these. He was the one who legalized private companies' space development projects under the Space Policy Directive-I. He also thoroughly reflected his “America First” principle in the space business. For example, all the substances obtained in space, including minerals, were no longer defined as "common goods." He also promised that space activities by private companies in the United States would be free from restrictions such as the Outer Space Treaty and the 1979 resolution by the United Nations Committee on the Peaceful Uses of Outer Space. Space and the moon were known as repositories of resources. As it became known that the resources that are scarce or will be depleted on Earth are very abundant outside the Earth in space, the space race has gotten intense. This is why the space race has been promoted on a geoeconomic level. However, in order to secure these benefits of geoeconomic strategies, geopolitical strategies must be accompanied. In other words, military defenses should be backed up to protect the resource acquisition process. Fearing this, the United Nations Committee on the Peaceful Uses of Outer Space strictly regulates the military use of space. However, the fact that the logic of developing naval power to protect long-range foreign interests on Earth is reflected in the strategic thinking of securing space profits is the decisive factor that has driven the space race today. The repositories of resources and future energy sources There are three strategic benefits that drive the U.S.-China competition for supremacy in space. The first is the infinite resource in space. There are endless resources buried in more than 10,000 asteroids orbiting the Earth. They are known to have an abundance of resources such as carbon, zinc, cobalt, platinum, gold, silver and titanium, in which platinum and titanium, for example, can be sold for $30,000 to $50,000 per kilogram.Second, the future energy source lies in space. Power supply using solar energy will be possible by establishing a space power plant that concentrates solar energy in the Earth-Moon area and transmitting it to Earth through laser beams. Here, the supplied solar power is known to be 35 to 70% more powerful than the solar energy on Earth. By 2100, 70 terawatts of energy will be needed, and it is expected that 332 terawatts can be supplied through the development of space solar power plants in a geostationary orbit. Third, the desire to dominate space for hegemony has established the space competition relationship between the U.S. and China. Although each started from different strategic interests, in the end, they have one common goal**.** First of all, China wants to be free from the U.S. GPS system. This is because only through the freedom China can prevent its future weapons system from becoming vulnerable to U.S. control and restrictions. It is planning to achieve its goal of establishing a so-called "Space Silk Road" by expanding China's "BeiDou" navigation system to the regions within One Belt One Road and the national satellite and communication systems. The U.S. also plans to spend $25 billion to develop GPS3 systems with stronger defense capabilities against Chinese space and cyberattacks, by 2025. The competition between the U.S. and China to establish a space station in order to secure the benefits from space strategies is inevitable. This is because a space station is the foundation for establishing space order. As the space station has the purpose of protecting and defending from enemies**,** militarization is inevitable in the process. It is clear that the outcome will lead to a space arms race. This is why the competition over supremacy in space between the U.S. and China has the aspects of the New Cold War outside the Earth.Space is a blue ocean. It is a world without order. Preemption is therefore important. In order to prepare space order and accompanying laws, norms, and systems, the U.S. and China have been engaged in a fierce battle through space projects. This is because space is the decisive factor in the operation of energy, resources, environment, communication, and advanced military weapons systems in the future. Space is no longer a dream world**.** Of course, it takes a lot of time for these strategic benefits to become a reality. However, the Fourth Industrial Revolution and the development of AI (Artificial Intelligence) technology will speed up the pace. This is because economic problems can be solved if spacecraft recycling is made possible with the participation of private companies and facilities related to space stations and mineral mining equipment are set up with 3D printers.

#### Heg is sustainable but not impervious to collapse

Hal Brands, 5-1-2021, Henry A. Kissinger Distinguished Professor At The Johns Hopkins School Of Advanced International Studies, China’s Creative Challenge—and the Threat to America, Commentary Magazine, https://www.commentarymagazine.com/articles/hal-brands/chinas-geopolitical-challenge-threat-to-america//Khan

FINALLY, CHINA is testing the patterns of history simply by taking on the United States. America is the most lethal competitor of the modern era, and it now has its sights set squarely on Beijing. Consider the historical record. In an environment populated mostly by hostile autocracies, America became a continental behemoth and the world’s strongest economy within a century. It then achieved something no other modern great power has managed—lasting, if periodically contested, hegemony in its home region. During the 20th century, America or the coalitions it supported decisively defeated a series of illiberal powers—Germany (twice), Japan, the Soviet Union—that challenged its vital interests. Along the way, Washington peacefully wrested global leadership from the United Kingdom. For over a century, the surest path to destruction has been inviting the focused hostility of the United States. America’s formidable record is the product of many factors. Vast resource endowments and uniquely advantageous geography have allowed America to project power globally without facing severe geopolitical threats near home. Similarly, the fact that America is powerful and far away leads countries all around the Eurasian periphery to ally with the United States against nearby predators that threaten their independence. The country’s relatively open economy has created great dynamism and innovation; its democratic institutions have allowed it, more often than not, to use its other advantages effectively. And the slowness with which America sometimes mobilizes to confront threats contributes to the single-mindedness with which it eventually combats them. The type of superpower America is also matters. Because America is a liberal nation, it has taken a liberal approach to global power. Since 1945, it has delivered freedom of the seas, a global reserve currency, and a massive market for foreign goods, in addition to providing security and stability in key regions. Those attributes have made other countries support the American cause, which makes American hegemony even harder to overturn. Neither China nor any other country can compete on these dimensions: Beijing lacks the ability to act as a global security provider and the willingness (as a neo-mercantilist actor) to anchor a truly open global economy. It cannot fully open its market without exposing key industries to competition and wrecking plans to reduce strategic dependence on the West. Even if China’s raw power exceeded America’s, its ability to act as a comparatively benign and popular hegemon would not. Having helped the United States defeat the Soviet Union, Chinese leaders understood the peril of provoking American hostility: This was the crux of Deng Xiaoping’s famous dictum about “hiding” capabilities and “biding” time. Chinese statecraft in the post-Tiananmen era was meant to increase Beijing’s power while delaying an American response. The building of deep commercial and financial ties with the United States not only fueled Chinese growth; it also made it more painful for America to turn toward competition. The cultivation of American elites in academia, business, and politics strengthened supporters of continued engagement. Even as Chinese statecraft become more assertive after 2008, Beijing moved incrementally—in the South China Sea and elsewhere—to avoid giving America an eye-opening “Sputnik moment.” And even as the relationship deteriorated during the Obama years, the Chinese leadership used the lure of cooperation on climate change and talk of a “new type of great-power relations” to discourage a sharper pivot in American policy. Historians will one day marvel at how well this strategy—combined with America’s post-9/11 distraction—worked. It took two decades, from the time serious observers began warning about the Chinese challenge, for the United States to adjust its statecraft decisively. During that time, China gained access to technology, capital, and markets that powered its ascent; there emerged an incredibly complex interdependence that continues to retard multilateral mobilization against Beijing. If the United States loses the competition with China, it will be—in no small part—because Beijing successfully anesthetized Washington to a growing peril. The bad news, from Xi’s vantage point, is that the game is up. Predatory economic behavior that America once tolerated has become more threatening as Beijing worked its way up global value chains. Small nibbles at the status quo eventually added up to larger, more alarming shifts. The Chinese government prematurely let the mask slip after the 2008–09 financial crisis, with more assertive diplomacy that gradually made the thesis of America’s engagement policy—that Beijing would mellow over time—impossible to defend. And by the Trump era, China had simply gotten tired of waiting and disguising its ambitions. COVID then did more than any Committee on the Present Danger could ever have done to reveal both the utterly cynical nature of the CCP regime—which sought to stymie the virus’s spread within China even as it allowed continued travel from Wuhan to the world—and the fact that this behavior could mortally imperil Americans’ well-being. China is no longer the “stealth superpower”—there is now a bipartisan consensus that America must thwart its global designs. From here onward, Beijing must forcefully wrest influence from a dangerous hegemon that is alert to a new authoritarian challenge. STRUCTURAL CONSTRAINTS don’t determine everything: History wouldn’t be very interesting if they did. The United States always had profound advantages over the Soviet Union, but it wouldn’t have won the Cold War had it not worked feverishly to shore up Western Europe in the late 1940s and maintain a military balance that made Soviet aggression seem suicidal. Strategic urgency and commitment were what ultimately allowed America to make the most of its strengths. That’s worth keeping in mind today. The fact that Chinese power and influence have grown so markedly in recent decades and that the resulting challenge has become so stark show the impact that determined, innovative strategy can have. The dilemmas that the United States confronts, in areas from 5G technology to the military balance in the Taiwan Strait, illustrate the costs of strategic lethargy. Indeed, America is fully capable of squandering its advantages if it degrades or destroys its own democracy, declines to make domestic reforms and investments to maintain its competitive edge, fails to rally the overlapping coalitions needed to resist Chinese ambitions, or delays in driving the military innovation required to shore up a sagging balance in the Western Pacific. The list of hard policy problems America must urgently solve to prevail against China is itself long and formidable. And even if Washington does prevail in that rivalry, America may absorb significant setbacks—and the international order may absorb significant damage—in the process. Yet as rough as the road ahead looks from Washington, it ought to look even rougher from Beijing. The Chinese Communist Party runs a profoundly illiberal regime that is trying to overcome centuries of liberal dominance. China is straining against a strategic geography and international system that surely seem more constraining than inviting. Chinese strategists must find a way of breaking America’s position in the Western Pacific while avoiding the potential cataclysm of major war. And Beijing is taking on a superpower that has thrashed all previous comers. Smart strategies have permitted Beijing to do remarkably well, so far, in managing these problems. But many of those strategies face an uncertain future, in part because the international complacency that allowed them to flourish has been replaced—gradually, but increasingly—with international concern. This isn’t to say that China’s ambitions are hopeless illusions. In the coming years, there will be an intense interaction between an America that is adapting its strategies to deal with a pressing threat and a China that will have to adjust its own approaches in light of that response. Even American success in this interaction could bring new dangers: If Chinese leaders perceive that their window to achieve grand geopolitical goals is closing, then the regime could become even more aggressive in seeking to revise the global order while it still can. Much thus hinges on the quality of decisions made in Washington and other capitals around the world. But the fact that so many characteristics of modern great-power politics seem to favor the United States probably gives the reigning superpower better options and more room for error than its autocratic challenger. Nothing is predetermined: Beijing may still succeed in displacing the United States as the primary power in Asia and, eventually, the world. Yet if it does, that outcome will represent a catastrophic failure of American statecraft—or an awesome triumph of Chinese strategy in overcoming the great obstacles that litter Beijing’s path to hegemony.

#### Decline causes unstable nuclear alliances that cause war

Hayes 18 [Peter Hayes, Nautilus Institute, Berkeley, California, USA; Center for International Security Studies, Sydney University. Trump and the Interregnum of American Nuclear Hegemony. November 8, 2018. <https://www.tandfonline.com/doi/full/10.1080/25751654.2018.1532525>]

During a post-hegemonic era, long-standing nuclear alliances are likely to be replaced by ad hoc nuclear coalitions, aligning and realigning around different congeries of threat and even actual nuclear wars, with much higher levels of uncertainty and unpredictability than was the case in the nuclear hegemonic system. There are a number of ways that this dynamic could play out during the interregnum, and these dynamics are likely to be inconsistent and contradictory. In some instances, the sheer momentum of past policy combined with bureaucratic inertia and the potency of political, military service and corporate interests, may ensure that residual aspects of the formerly hegemonic postures are adhered to even as formal nuclear alliances rupture. Even as they reach for the old anchors, these states may be forced to adjust and retrench strategically, or start to take their own nuclear risks by making increasingly explicit nuclear threats and deployments against nuclear-armed adversaries – as Japan has begun to do with reference to its “technological deterrent” since about 2012.9 This period could last for many years until and when nuclear war breaks out and leads to a post-nuclear war disorder; or a new, post-hegemonic strategic framework is established to manage and/or abolish nuclear threat. Under full-blown American nuclear hegemony, fewer states had nuclear weapons, the major nuclear weapons states entered into legally binding restraints on force levels and they learned from nuclear near-misses to promulgate rules of the road and tacit understandings. The lines drawn during full-blown collisions involving nuclear weapons were stark and concentrated the minds of leaders greatly. In a nuclear duel, it was clear that only one of two sides could fire first; the only question was which one. Now, with nine nuclear weapons states, and conflicts conceivably involving three, four or more of them, no matter how much leaders concentrate, it will not be evident who is aiming at who, who may fire first, and during a volley, who fired first and even who hit whom. In a highly proliferated world, nuclear-armed states may feel driven to obtain larger nuclear forces able to deter multiple adversaries at the same time, sufficient to conduct not only a few nuclear attacks but configured to fight more than one protracted nuclear war at a time, especially in nuclear states torn apart by civil war and post-nuclear attack reconstruction. The first time nuclear weapons are used since 1945 will be shocking, the second time, less so, the third time, the new normal.

#### China is revisionist---weak American responses guarantee war

Choi 18—Ji Young Choi, associate professor in the Department of Politics and Government and affiliated professor in the International Studies Program and East Asian Studies Program at Ohio Wesleyan University (“Historical and Theoretical Perspectives on the Rise of China: Long Cycles, Power Transitions, and China's Ascent,” *Asian Perspective*, Vol. 42, Issue 1, January-March 2018, pages 61-84, Available through ProQuest)

I have explored in light of historical and theoretical perspectives whether China is a candidate to become a global hegemonic power. The next question I will address is whether the ascent of China will lead to a hegemonic war or not. As mentioned previously, historical and theoretical lessons reveal that a rising great power tends to challenge a system leader when the former's economic and other major capabilities come too close to those of the latter and the former is dissatisfied with the latter's leadership and the international rules it created. This means that the rise of China could produce intense hegemonic competition and even a global hegemonic war. The preventive motivation by an old declining power can cause a major war with a newly emerging power when it is combined with other variables (Levy 1987). While a preventive war by a system leader is historically rare, a newly emerging yet even relatively weak rising power at times challenges a much more powerful system leader, as in the case of Japan's attack on Pearl Harbor in 1941 (Schweller 1999). A historical lesson is that "incomplete catch-ups are inherently conflict-prone" (Thompson 2006, 19). This implies that even though it falls short of surpassing the system leader, the rise of a new great power can produce significant instability in the interstate system when it develops into a revisionist power. Moreover, the United States and China are deeply involved in major security issues in East Asia (including the North Korean nuclear crisis, the Taiwan issue, and the South China Sea disputes), and we cannot rule out the possibility that one of these regional conflicts will develop into a much bigger global war in which the two superpowers are entangled. According to Allison (2017), who studied sixteen historical cases in which a rising power confronted an existing power, a war between the United States and China is not unavoidable, but escaping it will require enormous efforts by both sides. Some Chinese scholars (Jia 2009; Wang and Zhu 2015), who emphasize the transformation of China's domestic politics and the pragmatism of Beijing's diplomacy, have a more or less optimistic view of the future of US-China relations. Yet my reading of the situation is that since 2009 there has been an increasing gap between this optimistic view and what has really happened. It is premature to conclude that China is a revisionist state, but in what follows I will suggest some important signs that show China has revisionist aims at least in the Asia Pacific and could develop into a revisionist power in the future.¶ Beijing has concentrated on economic modernization since the start of pro-market reforms in the late 1970s and made efforts to keep a low profile in international security issues for several decades. It followed Deng Xiaoping's doctrine: "hide one's capabilities, bide one's time, and seek the right opportunity." Since 2003, China's motto has been "Peaceful Rise" or "Peaceful Development," and Chinese leadership has emphasized that the rise of China would not threaten any other countries. Recently, however, Beijing has adopted increasingly assertive or even aggressive foreign policies in international security affairs. In particular, China has been adamant about territorial issues in the East and South China Seas and is increasingly considered as a severe threat by other nations in the Asia Pacific region. Since 2009, for example, Beijing has increased naval activities on a large scale in the area of the Diaoyu/Senkaku Islands in the East China Sea. In 2010, Beijing announced that just like Tibet and Taiwan, the South China Sea is considered a core national interest. We can identify drastic rhetorical changes as well. In 2010, China's foreign minister publicly stated, "China is a big country . . . and other countries are small countries and that is just a fact" (Economist 2012). In October 2013, Chinese leader Xi Jinping also used the words "struggle and achieve results," emphasizing the importance of China's territorial integrity (Waldron 2014, 166-167). Furthermore, China has constructed man-made islands in the South China Sea to seek "de facto control over the resource-rich waters and islets" claimed as well by its neighboring countries (Los Angeles Times 2015). As of now, China's strategy is to delay a direct military conflict with the United States as long as possible and use its economic and political prowess to pressure smaller neighbors to give up their territorial claims (Doran 2012). These new developments and rhetorical signals reflect significant changes in China's foreign policies and signify that China's peaceful rise seems to be over.¶ A rising great power's consistent and determined policies to increase military buildups can be read as one of the significant signs of the rising power's dissatisfaction with the existing order and its willingness to do battle if it is really necessary. In the words of Rapkin and Thompson (2003, 318), "arms buildups and arms races . . . reflect substantial dissatisfaction on the part of the challenger and an attempt to accelerate the pace of military catchup and the development of a relative power advantage." Werner and Kugler (1996) also posit that if an emerging challenger's military expenditures are increasing faster than those of a system leader, parity can be very dangerous to the international political order. China's GDP is currently around 60 percent of that of the United States, so parity has not been reached yet. China's military budget, however, has grown enormously for the past two decades (double-digit growth nearly every year), which is creating concerns among neighboring nations and a system leader, the United States. In addition to its air force, China's strengthening navy or sea power has been one of the main goals in its military modernization program. Beijing has invested large financial resources in constructing new naval vessels, submarines, and aircraft carriers (Economist 2012). Furthermore, in its new defense white paper in 2015, Beijing made clear a vision to expand the global role for its military, particularly its naval force, to protect its overseas economic and strategic interests (Tiezzi 2015).¶ Sea power has special importance for an emerging great power. As Mahan (1987 [1890]) explained cogently in one of his classic books on naval strategy, Great Britain was able to emerge as a new hegemonic power because of the superiority of its naval capacity and technology and its effective control of main international sealanes. Naval power has a special significance for China, a newly emerging power, as well as for both economic and strategic reasons. First, its economy's rapid growth requires external expansion to ensure raw materials and the foreign markets to sell its products. Therefore, naval power becomes crucial in protecting its overseas business interests and activities. Second, securing major sea-lanes becomes increasingly important as they will be crucial lifelines for the supply of energy, raw materials, and other essential goods should China become involved in a hegemonic war or any other major military conflict (Friedberg 2011). In light of this, it is understandable why China is so stubborn over territorial issues in the South China and East China Seas. In fact, history tells us that many rising powers invested in sea power to expand their global influence, and indeed all the global hegemons including Great Britain and the United States were predominant naval powers.¶ Another important aspect is that Beijing is beginning to voice its dissatisfaction with the existing international economic order and take actions that could potentially change this order. The Chinese economy has overall benefited from the post-World War II international liberal order, but the Bretton Woods institutions like the IMF and the World Bank have been dominated by the United States and its allies and China does not have much power or voice in these institutions. Both institutions are based in Washington, DC, and the United States has enjoyed the largest voting shares with its veto power. Along with other emerging economies, China has called for significant reforms, especially in the governing system of the IMF, but reform plans to give more power to China and other emerging economies have been delayed by the opposition of the US Congress (Choi 2013). In response to this, Beijing recently took the initiative to create new international financial institutions including the AIIB. At this moment, it is premature to say that these new institutions would be able to replace the Bretton Woods institutions. Nonetheless, this new development can be read as a starting point for significant changes in global economic and financial governance that has been dominated by the United States since the end of World War II (Subacchi 2015).¶ China's historical legacies reinforce the view that China has a willingness to become a global hegemon. From the Ming dynasty in the late fourteenth century to the start of the first Opium War in 1839, China enjoyed its undisputed hegemonic position in East Asia. "Sino-centrism" that is related to this historical reality has long governed the mentality of Chinese people. According to this hierarchical world view, China, as the most advanced civilization, is at the center of East Asia and the world, and all China's neighbors are vassal states (Kang 2010). This mentality was openly revealed by the Chinese foreign minister's recent public statement that I quoted previously: "China is a big country . . . and other countries are small countries and that is just a fact" (Economist 2012). This view is related to Chinese people's ancient superiority complex that developed from the long history and rich cultural heritage of Chinese civilization (Jacques 2012). In a sense, China has always been a superpower regardless of its economic standing at least in most Chinese people's mind-set. The strong national or civilizational pride of Chinese people, however, was severely damaged by "the Century of Humiliation," a period between the first Opium War (1839) and the end of the Chinese Civil War (1949). During this period, China was encroached on by the West and invaded by Japan, experienced prolonged civil conflicts, and finally became a semicolony of Great Britain while its northern territory was occupied by Japan. China's economic modernization is viewed as a national project to lay an economic foundation to overcome this bitter experience of subjugation and shame and recover its traditional position and old glory (Choi 2015). Viewed from this perspective, economic modernization or the accumulation of wealth is not an ultimate objective of China. Rather, its final goal is to return to its traditional status by expanding its global political and military as well as economic influence. What it ultimately desires is recognition (Anerkennung), respect (Respekt), and status (Stellung). These are important concepts for constructivists who see ideational motives as the main driving forces behind interstate conflicts (Lebow 2008). This reveals that constructivist elements can be combined with long cycle and power transition theories in explaining the rise and fall of great powers, although further systematic studies on it are needed.¶ Considering all this, China has always been a territorial power rather than a trading state. China does not seem to be satisfied only with the global expansion of international trade and the conquest of foreign markets. It also wants to broaden its (particularly maritime) territories and spheres of influence to recover its traditional political status as the Middle Kingdom. As emphasized previously, the type or nature and goals or ideologies of a rising power matter. Nazi Germany and Imperial Japan (territorial powers) experienced rapid economic expansion and sought to expand their territories and influence in the first half of the twentieth century. For example, during this period Japan's goal was to create the Japanese empire in East Asia under the motto of the East Asian Co-prosperity Sphere. On the other hand, democratized Germany and Japan (trading powers) that enjoyed a second economic expansion did not pursue the expansion of their territories and spheres of influence in the post-World War II era. Twentiethcentury history suggests that political regimes predicated upon nondemocratic or nonliberal values and cultures (for instance, Nazism in Germany and militarism in Japan before the mid-twentieth century, and communism in the Soviet Union during the Cold War) can pose significant challenges to democratic and liberal regimes. The empirical studies of Lemke and Reed (1996) show that the democratic peace thesis can be used as a subset of power transition theory. According to their studies, states organized similarly to the dominant powers politically and economically (liberal democracy) are generally satisfied with the existing international rules and order and they tend to be status quo states. Another historical lesson is that economic interdependence alone cannot prevent a war for hegemony. Germany was one of the main trade partners of Great Britain before World War I (Friedberg 2011), and Japan was the number three importer of American products before its attack on Pearl Harbor (Keylor 2011). A relatively peaceful relationship or transition is possible when economic interdependence is supported by a solid democratic alliance between a rising great power and an existing or declining one.¶ Some scholars such as Ikenberry (2008) emphasize nuclear deterrence and the high costs of a nuclear war. Power transition theorists agree that the high costs of a nuclear war can constrain a war among great powers but do not view them as "a perfect deterrent" to war (Kugler and Zagare 1990; Tammen et al. 2000). The idea of nuclear deterrence is based upon the assumption of the rationality of actors (states): as long as the costs of a (nuclear) war are higher than its benefits, an actor (state) will not initiate the war. However, even some rationalists admit that certain actors (such as exceedingly ambitious risk-taking states) do not behave rationally and engage in unexpected military actions or pursue military overexpansion beyond its capacity (Glaser 2010). The state's behaviors are driven by its values, perceptions, and political ambitions as well as its rational calculations of costs and benefits. Especially, national pride, historical memories, and territorial disputes can make states behave emotionally. The possibility of a war between a democratic nation and a nondemocratic regime increases because they do not share the same values and beliefs and, therefore, the level of mistrust between them tends to be very high. China and the United States have enhanced their cooperation to address various global issues like global warming, international terrorism, energy issues, and global economic stability. But these issues are not strong enough to bring them together to overcome their mistrust that stems from their different values, beliefs, and perceptions (Friedberg 2011). What is more important is whether they can set mutually agreeable international rules on traditional security issues including territorial disputes.

#### Pentagon warfare is uniquely escalatory – nuclear war is certain

Talmadge 18 (Caitlin Talmadge is Associate Professor of Security Studies at the Edmund A. Walsh School of Foreign Service at Georgetown University. This essay is adapted from “Would China Go Nuclear? Assessing the Risk of Chinese Nuclear Escalation in a Conventional War with the United States,” International Security, Spring 2017, "Beijing’s Nuclear Option," Foreign Affairs, 10-15-2018, https://www.foreignaffairs.com/articles/china/2018-10-15/beijings-nuclear-option) // ris recut

As China’s power has grown in recent years, so, too, has the risk of war with the United States. Under President Xi Jinping, China has increased its political and economic pressure on Taiwan and built military installations on coral reefs in the South China Sea, fueling Washington’s fears that Chinese expansionism will threaten U.S. allies and influence in the region. U.S. destroyers have transited the Taiwan Strait, to loud protests from Beijing. American policymakers have wondered aloud whether they should send an aircraft carrier through the strait as well. Chinese fighter jets have intercepted U.S. aircraft in the skies above the South China Sea. Meanwhile, U.S. President Donald Trump has brought long-simmering economic disputes to a rolling boil. A war between the two countries remains unlikely, but the prospect of a military confrontation—resulting, for example, from a Chinese campaign against Taiwan—no longer seems as implausible as it once did. And the odds of such a confrontation going nuclear are higher than most policymakers and analysts think. Members of China’s strategic com­munity tend to dismiss such concerns. Likewise, U.S. studies of a potential war with China often exclude nuclear weapons from the analysis entirely, treating them as basically irrelevant to the course of a conflict. Asked about the issue in 2015, Dennis Blair, the former commander of U.S. forces in the Indo-Pacific, estimated the likelihood of a U.S.-Chinese nuclear crisis as “somewhere between nil and zero.” This assurance is misguided. If deployed against China, the Pentagon’s preferred style of conventional warfare would be a potential recipe for nuclear escalation. Since the end of the Cold War, the United States’ signature approach to war has been simple: punch deep into enemy territory in order to rapidly knock out the opponent’s key military assets at minimal cost. But the Pentagon developed this formula in wars against Afghanistan, Iraq, Libya, and Serbia, none of which was a nuclear power. China, by contrast, not only has nuclear weapons; it has also intermingled them with its conventional military forces, making it difficult to attack one without attacking the other. This means that a major U.S. military campaign targeting China’s conventional forces would likely also threaten its nuclear arsenal. Faced with such a threat, Chinese leaders could decide to use their nuclear weapons while they were still able to. As U.S. and Chinese leaders navigate a relationship fraught with mutual suspicion, they must come to grips with the fact that a conventional war could skid into a nuclear confrontation. Although this risk is not high in absolute terms, its consequences for the region and the world would be devastating. As long as the United States and China continue to pursue their current grand strategies, the risk is likely to endure. This means that leaders on both sides should dispense with the illusion that they can easily fight a limited war. They should focus instead on managing or resolving the political, economic, and military tensions that might lead to a conflict in the first place.

#### US pursuit of hegemony makes existential conflict inevitable – only solution is immediate and absolute US dominance

**Latham 21** – Latham, Andrew, 12 August 2021, “Will China-US Great Power Competition Lead to War? A Thomistic Perspective,” E-International Relations, Andrew Latham is a professor of International Relations at Macalester College in Saint Paul, Minnesota, specializing in the politics of international conflict and security. He teaches courses on international security, Chinese foreign policy, war and peace in the Middle East, Regional Security in the Indo-Pacific Region, and the World Wars [Harker KB]

On the contrary, in the same way that “[the rise of Athens and the fear that this instilled in Sparta… made war inevitable](http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0200%3Abook%3D1%3Achapter%3D23),” so too the rise of China will instill fear in the United States, driving great power competition and making war between these two powers inevitable as well. Arguments in Favor of the thesis I answer that, if the current trend-lines concerning the development of Chinese and US comprehensive national power (i.e. power in its economic, diplomatic, institutional, and military forms) are projected out a decade or so, they will intersect. When this happens, history dictates that, absent certain highly atypical mitigating circumstances, an armed conflict is destined to erupt between these two powers. Such mitigating circumstances, history teaches us, include mutual exhaustion as a result of other conflicts (as in the Portuguese/Spanish case), and a disposition on the part of a declining hegemon to accommodate a rising one (on the basis of shared values and interests, as in the UK/US case). Perhaps obviously, none of these mitigating conditions obtains in the contemporary case. Given the prospect that such a conflict has the potential to be catastrophically counter-productive for all involved, it may well be the case that both of the principals will limit the types of weapons employed (use of nuclear weapons, for example, will be eschewed), their targets (large civilian centers will not be attacked), and perhaps even their operating environments (space, it is reasonable to assume, will be off limits). This being said, all other types or weapons (hypersonic cruise missiles and anti-ship ballistic missiles, for example) and operational concepts (hybrid war and cyber-war, to take but two obvious examples) will likely be employed à l’outrance. Thus whatever the limits with respect to means, it is highly unlikely that the stakes of the looming Sino-American war will be limited in any meaningful way: this will be a struggle for mastery of the globe in which only one power (and perhaps, in a worst-case scenario, neither power) will prevail. There is nothing to suggest that once the trend-lines intersect, the US will peacefully accommodate the PRC’s attempt to usurp the mantle of global leadership. I concede the following points to those who assert that the Thucydides Trap is escapable. First, the trap may be avoided if the US acts now with prudence, fortitude and strategic skill it may be able to dissuade the PRC from aggressively seeking to realize its hegemonic aspirations. This might include taking steps to bend either the US or Chinese trend lines in ways favorable to the status quo, containing or rolling back Chinese efforts to position itself favorably for a bid for hegemony, and/or rallying the international community in support of US leadership and in opposition to China’s bid for global hegemony. Second, it is also possible that the Trap may be escaped if there is a change of regime, or a change in regime leadership, in the PRC. Finally, the trap may not spring if China’s economic growth peaks well short of overtaking that of the US. It follows from all this that the recent and accelerating growth in China’s comprehensive national power, increasingly harnessed to the hegemonic aspirations intrinsic to Xi Jinping’s “China Dream”, is likely to result in a systemic war with the US in the foreseeable future. Replies to objections Reply to Objection 1: Economic interdependence was higher in Europe in 1914 than between the US and PRC today, a fact that didn’t prevent the rise of another aspiring hegemon seeking its “place in the sun” from triggering a catastrophic world war. To be sure, the literature dealing with the outbreak of the First World War is vast and varied. No one doubts, however, that whether the war was an accident (the world somehow “slithered over the brink into the boiling cauldron of war” in David Lloyd George’s felicitous phrase) or the result of Germany’s or Russia’s or some other power’s strategic (mis)calculation, it happened despite extensive and multi-dimensional (economic, social, and cultural) integration – indeed, it happened in the context of a degree of integration that was not reached again in Europe until recent decades. Extensive and deep economic integration – with all the associated mutual sensitivity and vulnerability that entails – is thus no prophylactic against systemic or hegemonic war. Reply to Objection 2: Given the degree to which still-raw memories of the recent Great War – coupled with fears of catastrophic destruction at the hands of massive fleets of strategic bombers –permeated popular, political, and military cultures during the interwar period, one might reasonably have expected that the prospect of a second world war would have been rendered simply unthinkable. And yet, just over two decades after the Armistice was signed in 1918 the world was at war again. Thus we must conclude that we cannot count on fear of death to deter or prevent the outbreak of war – even war that might involve the use of nuclear weapons, and even war that has the potential to trigger a planetary extinction event. Reply to Objection 3: The PRC may or may not need to displace the US and assume the mantle of global hegemony, but that is clearly and undeniably what the dominant faction within the CCP desires. Indeed, the CCP ruling clique more than simply desires such an outcome, it sees it as (a) absolutely necessary, (b) unquestionably foreordained, and (c) entirely right and just. In their mind, the necessity is a function of political logic: they need this victory over the Americans as a means of cementing fealty and homage to a regime that otherwise rests on increasingly wobbly foundations. China’s rulers see it as foreordained in that global domination is the natural and inevitable telos of China’s pre- and post-revolutionary history (the former a deeply embedded cultural disposition sometimes referred to as the “Middle Kingdom Syndrome”; the latter a function of Marxist-Leninist ideology and Xi’s revival of Mao Zedong Thought). And, perhaps most importantly, the CCP ruling clerisy believe it to be only right and just that China should reprise its historical role as the Middle Kingdom – that is, as the righteous center of the universe around which all other powers revolve, and the preeminent political power to which all others owe tribute and deference. Consequently, it is reasonable to expect that the PRC will continue, indeed intensify, its current strategic campaign to displace the United States as both the dominant power in the Indo-Pacific region and the hegemonic power on the world stage.

## Framing

#### Reducing existential risks is the top priority in any coherent moral theory

Pummer 15

(Theron, Philosophy @St. Andrews http://blog.practicalethics.ox.ac.uk/2015/05/moral-agreement-on-saving-the-world/)

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people. Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake. Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don’t matter. Even John Rawls wrote, “All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.” Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view. They’d thus imply very strong reasons to reduce existential risk, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk. It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. We should also take into account moral uncertainty. What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I’ve just argued that there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world. Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation). Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, all minimally plausible moral views would converge on the conclusion that we should try to save the world. While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.” (From chapter 36 of On What Matters)