# 1

#### Interpretation: Debaters must disclose all constructive positions on open source with highlighting on the 2021-22 NDCA LD wiki under their name after the round in which they read them.

#### Violation – they don’t disclose highlighting, screenshots in the doc

#### 1] Debate resource inequities—you’ll say people will steal cards, but that’s good—it’s the only way to truly level the playing field for students such as novices in under-privileged programs. Independent voter for accessibility which outweighs since it’s a prerequisite to debate

Overing 18 – Bob Overing, LD Scholar (“Holiday Disclosure Post #6 – 10 Things Edition” JANUARY 12, 2018. http://www.premierdebate.com/disclosure-post-6/)

**Open source improves on usual disclosure practices** in the obvious way – **you can read their evidence for better prep**aration – and in a number of smaller ways too. **It solves the analytics problem** I discussed above, **so round-altering uncarded arguments are available** (though this doesn’t really apply to Harvard-Westlake), **and it gives access to evidence from paywalled articles**. **Every season I coach debaters who lack access to major databases; for schools without robust online library offerings or teams without college coaches, this matters a lot**.

#### 2] Evidence ethics – with highlighting is the only way to verify pre-round that cards aren’t miscut or highlighted or bracketed unethically. Also key to recuttings and fully understnaind the aff which controls the internal link to clash. That’s a voter – maintaining ethical ev practices is key to being good academics and we should be able to verify you didn’t cheat

#### Drop the debater: DTA is illogical in this instance since there is no argument to drop.

#### Competing interps: a) Reasonability encourages intervention because it is arbitrary and b) devolves to competing interps because we vote on the better briteline through offense/defense

#### No RVIs: It creates a chilling effect- debaters will be infinitely abusive in order to bait theory debates and win off of an RVI.

#### Just because you are fair doesn’t mean you should win. If that were true, both debaters would win rounds without theory, which would be irresolvable, and resolvability comes first since every debate needs a winner.

# 2

CP: The People’s Republic of China should convene a meeting of parties to the Outer Space Treaty and propose an Optional Protocol for review and acceptance by any state that establishes rules for peacetime behavior in space. The People’s Republic of China should ratify and implement the protocol.

#### Multilat avoids backlash.

Meyer ’18 [Paul, Senior Fellow in Space Security at The Simons Foundation Canada, Adjunct Professor of International Studies at Simon Fraser University, Fellow in International Security at Simon Fraser University’s Centre for Dialogue, “Diplomacy: The Missing Ingredient in Space Security”, Simons Papers in Security and Development, Number 67, November, p. 15-17 [Note – ‘GGE’ = Group of Governmental Experts (GGE) on Transparency and Confidence-Building Measures (TCBMs) in Outer Space Activities]

A Way Forward

As the leading space power appears to be bent on unilateral steps regarding space security matters, a challenge is posed to those wishing to uphold the “peaceful purposes” aims of the Outer Space Treaty. Remedial action to promote cooperative security approaches in outer space will require a far more active campaign that is not limited to states, but which also engages all constituencies within the space community. While the three multilateral processes mentioned earlier hold out some prospect of success, they are a thin reed to lean on given their inherent constraints. Any effort to revitalize space security diplomacy will need to feature several, mutually reinforcing measures. Some possible near-term steps that could be taken to avoid a drift into space conflict and which would help to restore a more constructive atmosphere include the following:

1. All states should practice strategic restraint in their military space programs, offer greater transparency as to their nature and mute the escalating threat rhetoric and belligerent posturing.

2. A representative group of states should initiate a process at the UNGA to establish an open-ended working group to elaborate an International Code of Conduct on outer space activities. Despite its problematic diplomatic roll-out by the EU, this initiative has too much useful potential to be simply set aside and abandoned.

3. Whereas through the creation of the GGE, China and Russia have managed finally to escape the moribund CD and empower a UN forum to initiate discussion of their proposed PPWT and legally binding arms control in space generally, this step needs amplification. The closed-door nature of the GGE process and its dependency on an ultimate consensus for results, makes this a risky vehicle for conducting a discussion of legally binding versus politically binding approaches to space security. The GGE could be supplemented by a series of open-ended consultations hosted by concerned states or NGOs to permit discussion of the important factors of definitions, scope and verification that have not had a thorough or transparent airing in a multilateral context.

4. Similarly, a concerted effort is made to revisit and promote the TCBMs recommended by the 2013 GGE. Greater acceptance and implementation of these TCBMs would be a powerful counter-force to those seeking to depict outer space as a battleground in which inter-state conflict is inevitable. While it would be desirable if a group of like-minded states cooperated on convening a conference to focus on TCBMs this work could also benefit from private sector and civil society involvement as well.

5. A deliberate effort is pursued to re-establish common ground concerning the regime governing outer space. As the Outer Space Treaty is the embodiment of this regime, an effort to raise its profile and remind audiences of its core principles and provisions is called for. One step of both symbolic and substantive importance would be to have a champion state or a ginger group of “Friends of the Outer Space Treaty” to convene the first ever meeting of its state’s parties. As an early multilateral accord the Outer Space Treaty was not provided with follow-up mechanisms and hence lacks the attention that annual conferences of states parties provide for most multilateral agreements. After half a century of being in effect it is overdue to bring together its membership. Such a diplomatic gathering in honor of this cornerstone treaty could help consolidate support for its key principles and obligations as well as stimulate new cooperative steps for the future. A suitable gathering of states parties could also provide an incentive for further universalization of the treaty as countries outside the treaty will likely want to attend.

These proposed actions could help revitalize diplomacy, that missing ingredient from current considerations of space security and realign the depiction of outer space as a realm of promising international cooperation rather than one of inevitable confrontation and conflict.

#### Fractionalization kills space law.

Beard ’17 [Jack, Assistant Professor of Law at the University of Nebraska College of Law, Space, Cyber & Telecommunications Law Program, LLM from Georgetown University, JD from the University of Michigan School of Law, and Former Associate Deputy General Counsel (International Affairs) at the Department of Defense, Former Lieutenant Colonel in the Judge Advocate General's Corps in the U.S. Army Reserve, “Soft Law's Failure on the Horizon: The International Code of Conduct for Outer Space Activities”, University of Pennsylvania Journal of International Law, Spring 2017, 38 U. Pa. J. Int'l L. 335, Lexis]

Russia and China thus continue to lie beyond the reach of the Code, defeating efforts by proponents to make the Code a widely subscribed and broadly accepted instrument and greatly diminishing its purported "norm-setting" capabilities. Whatever benefits soft law instruments are asserted to have in addressing security matters, participation by only a fraction of states in the Code, particularly a fraction that fails to include all the major space-faring countries, will not provide a sound basis for establishing new norms or help to identify or isolate aggressors and other non-participating, misbehaving states. Furthermore, states facing perceived security threats in space are not likely to be assured by a fractional version of the Code in which their potential adversaries do not even participate.

In some areas of international cooperation, such as the protection of human rights, persuading only a fraction of states to initially sign multilateral instruments may be viewed as a positive, progressive [\*394] step of achievement (particularly since human rights agreements are not focused on reciprocal obligations). 240 As an arms control initiative for space, however, the Code's failure to include Russia and China and other major space stakeholders is a fundamental flaw. The absence of powerful, potential adversaries makes multilateral conventions addressing arms control or disarmament issues highly problematic for those states contemplating joining such regimes and making potentially dangerous, non-reciprocal commitments. 241 [FOOTNOTE] 241 Richard L. Williamson Jr., Hard Law, Soft Law, and Non-Law in Multilateral Arms Control: Some Compliance Hypotheses, 4 Chi. J. Int'l L 59, 61-62 (2003) ("Other matters can affect a treaty's effectiveness, such as the degree to which essential nations become parties to the treaty. If key parties remain outside the treaty, it increases pressure on the other states to withdraw or cheat"). [END FOOTNOTE] To the extent that soft law arrangements such as the proposed Code seek to promote arms control measures in the face of severe security dilemmas and the threat of arms races, the non-participation of powerful adversaries clearly undermines such efforts.

If the proposed Code is adopted by states in its current state of limited acceptance, a fractional soft law product will emerge which will present its own particular disadvantages and problems (beyond those associated with soft law arrangements generally). Not only would a fractionalized Code fail to identify aggressors and isolate rogue states, it could instead lead to de facto competing legal regimes in space, as subscribing states respect their own "rules of the road" while other non-participating states - especially major, non-participating space powers - seek to advance their own interests through different or less restrictive approaches. Attempts to later successfully persuade non-participating states to accede to the Code will be challenging, if not impossible, and could risk further weakening rather than improving the Code. 242

#### Extinction.

Pelton ’17 [Joseph, PhD in International Relations from Georgetown University, Director Emeritus of the Space and Advanced Communications Research Institute at George Washington University, The New Gold Rush: The Riches of Space Beckon!, p. 1-9]

Are We Humans Doomed to Extinction?

What will we do when Earth’s resources are used up by humanity? The world is now hugely over populated, with billions and billions crammed into our overcrowded cities. By 2050, we may be 9 billion strong, and by 2100 well over 11 billion people on Planet Earth. Some at the United Nations say we might even be an amazing 12 billion crawling around this small globe. And over 80 % of us will be living in congested cities. These cities will be ever more vulnerable to terrorist attack, natural disaster, and other plights that come with overcrowding and a dearth of jobs that will be fueled by rapid automation and the rise of artificial intelligence across the global economy. We are already rapidly running out of water and minerals. Climate change is threatening our very existence. Political leaders and even the Pope have cautioned us against inaction. Perhaps the naysayers are right. All humanity is at tremendous risk. Is there no hope for the future? This book is about hope. We think that there is literally heavenly hope for humanity. But we are not talking here about divine intervention. We are envisioning a new space economy that recognizes that there is more water in the skies that all our oceans. Th ere is a new wealth of natural resources and clean energy in the reaches of outer space—more than most of us could ever dream possible. There are those that say why waste money on outer space when we have severe problems here at home? Going into space is not a waste of money. It is our future. It is our hope for new jobs and resources. The great challenge of our times is to reverse public thinking to see space not as a resource drain but as the doorway to opportunity. The new space frontier can literally open up a “gold rush in the skies.” In brief, we think there is new hope for humanity. We see a new a pathway to the future via new ventures in space. For too long, space programs have been seen as a money pit. In the process, we have overlooked the great abundance available to us in the skies above. It is important to recognize there is already the beginning of a new gold rush in space—a pathway to astral abundance. “New Space” is a term increasingly used to describe radical new commercial space initiatives—many of which have come from Silicon Valley and often with backing from the group of entrepreneurs known popularly as the “space billionaires.” New space is revolutionizing the space industry with lower cost space transportation and space systems that represent significant cost savings and new technological breakthroughs. “New Commercial Space” and the “New Space Economy” represent more than a new way of looking at outer space. These new pathways to the stars could prove vital to human survival. If one does not believe in spending money to probe the mysteries of the universe then perhaps we can try what might be called “calibrated greed” on for size. One only needs to go to a cubesat workshop, or to Silicon Valley or one of many conferences like the “Disrupt Space” event in Bremen, Germany, held in April 2016 to recognize that entrepreneurial New Space initiatives are changing everything [ 1 ]. In fact, the very nature and dimensions of what outer space activities are today have changed forever. It is no longer your grandfather’s concept of outer space that was once dominated by the big national space agencies. Th e entrepreneurs are taking over. The hopeful statements in this book and the hard economic and technical data that backs them up are more than a minority opinion. It is a topic of growing interest at the World Economic Forum, where business and political heavyweights meet in Davos, Switzerland, to discuss how to stimulate new patterns of global economic growth. It is even the growing view of a group that call themselves “space ethicists.” Here is how Christopher J. Newman, at the University of Sunderland in the United Kingdom has put it: Space ethicists have offered the view that space exploration is not only desirable; it is a duty that we, as a species, must undertake in order to secure the survival of humanity over the longer term. Expanding both the resource base and, eventually, the habitats available for humanity means that any expenditure on space exploration, far from being viewed as frivolous, can legitimately be rationalized as an ethical investment choice. (Newman) On the other hand there are space ethicists and space exobiologists who argue that humans have created ecological ruin on the planet—and now space debris is starting to pollute space. Th ese countervailing thoughts by the “no growth” camp of space ethicists say we have no right to colonize other planets or to mine the Moon and asteroids—or at least no right to do so until we can prove we can sustain life here on Earth for the longer term. However, for most who are planning for the new space economy the opinion of space philosophers doesn’t really fl oat their boat. Legislators, bankers, and aspiring space entrepreneurs are far more interested in the views of the super-rich capitalists called the space billionaires. A number of these billionaires and space executives have already put some very serious money into enterprises intent on creating a new pathway to the stars. No less than fi ve billionaires with established space ventures—Elon Musk, Paul Allen, Jeff Bezos, Sir Richard Branson, and Robert Bigelow—have invested millions if not billions of dollars into commercializing space. Th ey are developing new technologies and establishing space enterprises that can bring the wealth of outer space down to Earth. Th is is not a pipe dream, but will increasingly be the economic reality of the 2020s. Th ese wealthy space entrepreneurs see major new economic opportunities. To them space represents the last great frontier for enterprising pioneers. Th us they see an ever-expanding space frontier that off ers opportunities in low-cost space transportation, satellite solar power satellites to produce clean energy 24 h a day, space mining, space manufacturing and production, and eventually space habitats and colonies as a trajectory to a better human future. Some even more visionary thinkers envision the possibility of terraforming Mars, or creating new structures in space to protect our planet from cosmic hazards and even raising Earth’s orbit to escape the rising heat levels of the Sun in millennia to come. Some, of course, will say this is sci-fi hogwash. It can’t be done. We say that this is what people would have said in 1900 about airplanes, rocket ships, cell phones and nuclear devices. The skeptics laughed at Columbus and his plan to sail across the oceans to discover new worlds. When Thomas Jefferson bought the Louisiana Purchase from France or Seward bought Alaska, there were plenty of naysayers that said such investment in the unknown was an extravagant waste of money. A healthy skepticism is useful and can play a role in economic and business success. Before one dismisses the idea of an impending major new space economy and a new gold rush, it might useful to see what has already transpired in space development in just the past fi ve decades. Th e world’s fi rst geosynchronous communications satellite had a throughput capability of about 500 kb / s. In contrast, today’s state of the art Viasat 2 —a half century later— has an impressive throughput of some 140 Gb/s. Th is means that the relative throughput is nearly 300,000 greater, while its lifetime is some ten times longer (Figs. 1.1 and 1.2 ). Each new generation of communications satellite has had more power, better antenna systems, improved pointing and stabilization, and an extended lifetime. And the capabilities represented by remote sensing satellites , meteorological satellites , and navigation and timing satellites have also expanded their capabilities and performance in an impressive manner. When satellite applications fi rst started, the market was measured in millions of dollars. Today commercial satellite services exceed a quarter of a billion dollars. Vital services such as the Internet, aircraft traffi c control and management, international banking, search and rescue and much, much more depend on application satellites. Th ose that would doubt the importance of satellites to the global economy might wish to view on You Tube the video “If Th ere Were a Day Without Satellites?” [ 2 ]. Let’s check in on what some of those very rich and smart guys think about the new space economy and its potential. (We are sorry to say that so far there are no female space billionaires, but surely this, too, will come someday soon.) Of course this twenty-fi rst century breakthrough that we call the New Space economy will not come just from new space commerce. It will also come from the amazing new technologies here on Earth. Vital new terrestrial technologies will accompany this cosmic journey into tomorrow. Information technology, robotics, artifi cial intelligence and commercial space travel systems have now set us on a course to allow us humans to harvest the amazing riches in the skies—new natural resources, new energy, and even totally new ways of looking at the purpose of human existence. If we pursue this course steadfastly, it can be the beginning of a New Space renaissance. But if we don’t seek to realize our ultimate destiny in space, Homo sapiens can end up in the dustbin of history—just like literally millions of already failed species. In each and every one of the fi ve mass extinction events that have occurred over the last 1.5 billion years on Earth, some 50–80 % of all species have gone the way of the T. Rex, the woolly mammoth, and the Dodo bird along with extinct ferns, grasses and cacti. On the other hand, the best days of the human race could be just beginning. If we are smart about how we go about discovering and using these riches in the skies and applying the best of our new technologies, it could be the start of a new beginning for humanity. Konstantin Tsiokovsky, the Russian astronautics pioneer, who fi rst conceived of practical designs for spaceships, famously said: “A planet is the cradle of mankind, but one cannot live in a cradle forever.” Well before Tsiokovsky another genius, Leonardo da Vinci, said, quite poetically: “Once you have tasted fl ight, you will forever walk the earth with your eyes turned skyward, for there you have been, and there you will always long to return.” Th e founder of the X-Prize and of Planetary Resources, Inc., Dr. Peter Diamandis, has much more brashly said much the same thing in quite diff erent words when he said: “Th e meek shall inherit the Earth. Th e rest of us will go to Mars.” The New Space Billionaires Peter Diamandis is not alone in his thinking. From the list of “visionaries” quoted earlier, Elon Musk, the founder of SpaceX; Sir Richard Branson, the founder of Virgin Galactic; and Paul Allen, the co-founder of Microsoft and the man who fi nanced SpaceShipOne, the world’s fi rst successful spaceplane have all said the future will include a vibrant new space economy. Th ey, and others, have said that we can, we should and we soon shall go into space and realize the bounty that it can off er to us. Th e New Space enterprise is today indeed being led by those so-called space billionaires , who have an exciting vision of the future. Th ey and others in the commercial space economy believe that the exploitation of outer space may open up a new golden age of astral abundance. Th ey see outer space as a new frontier that can be a great source of new materials, energy and various forms of new wealth that might even save us from excesses of the past. Th is gold rush in the skies represents a new beginning. We are not talking about expensive new space ventures funded by NASA or other space agencies in Europe, Japan, China or India. No, these eff orts which we and others call New Space are today being forged by imaginative and resourceful commercial entrepreneurs. Th ese twenty-fi rst century visionaries have the fortitude and zeal to look to the abundance above. New breakthroughs in technology and New Space enterprises may be able to create an “astral life raft” for humanity. Just as Columbus and the Vikings had the imaginative drive that led them to discover the riches of a new world, we now have a cadre of space billionaires that are now leading us into this New Space era of tomorrow. Th ese bold leaders, such as Paul Allen and Sir Richard Branson, plus other space entrepreneurs including Jeff Bezos of Amazon and Blue Origin, and Robert Bigelow, Chairman of Budget Suites and Bigelow Aerospace, not only dream of their future in the space industry but also have billions of dollars in assets. Th ese are the bright stars of an entirely new industry that are leading us into the age of New Space commerce . Th ese space billionaires, each in their own way, are proponents of a new age of astral abundance. Each of them is launching new commercial space industries. Th ey are literally transforming our vision of tomorrow. Th ese new types of entrepreneurial aerospace companies—the New Space enterprises—give new hope and new promise of transforming our world as we know it today. The New Space Frontier What happens in space in the next few decades, plus corresponding new information technologies and advanced robotics, will change our world forever. Th ese changes will redefi ne wealth, change our views of work and employment and upend almost everything we think we know about economics, wealth, jobs, and politics. Th ese changes are about truly disruptive technologies of the most fundamental kinds. If you thought the Internet, smart phones, and spandex were disruptive technologies, just hang on. You have not seen anything yet. In short, if you want to understand a transition more fundamental than the changes brought to the twentieth century world by computers, communications and the Internet, then read this book. There are truly riches in the skies. Near-Earth asteroids largely composed of platinum and rare earth metals have an incredible value. Helium-3 isotopes accessible in outer space could provide clean and abundant energy. There is far more water in outer space than is in our oceans. In the pages that follow we will explain the potential for a cosmic shift in our global economy, our ecology, and our commercial and legal systems. These can take place by the end of this century. And if these changes do not take place we will be in trouble. Our conventional petro-chemical energy systems will fail us economically and eventually blanket us with a hydrocarbon haze of smog that will threaten our health and our very survival. Our rare precious metals that we need for modern electronic appliances will skyrocket in price, and the struggle between “haves” and “have nots” will grow increasingly ugly. A lack of affordable and readily available water, natural resources, food, health care and medical supplies, plus systematic threats to urban security and systemic warfare are the alternatives to astral abundance. The choices between astral abundance and a downward spiral in global standards of living are stark. Within the next few decades these problems will be increasingly real. By then the world may almost be begging for new, out of- the-box thinking. International peace and security will be an indispensable prerequisite for exploitation of astral abundance, as will good government for all. No one nation can be rich and secure when everyone else is poor and insecure. In short, global space security and strategic space defense, mediated by global space agreements, are part of this new pathway to the future.

#### Cooperation de-escalates the Space Race, solves Sino-Russian axis, and spills-over to broader US-China relations

Marshall and Hadfield 21 Will Marshall and Chris Hadfield 4-15-2021 "Why the U.S. and China Should Collaborate in Space" <https://time.com/5954941/u-s-china-should-collaborate-in-space/> (CEO of Planet which operates 200 satellites that image the entire Earth landmass on a daily basis, and he formerly worked at NASA on lunar missions and space debris. Colonel Chris Hadfield was Commander of the International Space Station and flew both the U.S. Space Shuttle and Russian Soyuz vehicles. Prior to that he served as a fighter/test pilot with the U.S. Air Force, U.S. Navy, and Royal Canadian Air Force.)//Elmer

While much has been made of the tense March 18 exchange between American and Chinese diplomats in Anchorage, Alaska, one area became an unlikely candidate for cooperation: outer space. During a press conference after the meeting, Jake Sullivan, the U.S. National Security Advisor, pointed out that the Perseverance rover that recently landed on Mars “wasn’t just an American project. It had technology from multiple countries from Europe and other parts of the world.” China’s top diplomat, Yang Jiechi, seized the opportunity to say that, “China would welcome it if there is a will to carry out similar cooperation from the United States with us.” Planned or not, Yang’s comment gave voice to one very smart way two geopolitical rivals sharing the same planet could work together despite their growing tensions. Space exploration has long been used to foster deep cooperation, even between adversaries. During the height of the Cold War, the U.S. and U.S.S.R. jointly undertook the 1975 Apollo-Soyuz mission, which both served as a means of political rapprochement and opened the possibility of cooperation in other areas. Those links endured. After the Soviet Union collapsed, Russia was invited to partner in the construction of the International Space Station (ISS). It was a multi-layered act that went beyond simple generosity; the more work former Soviet scientists had to do designing and building the ISS, the less likely they’d be to sell their expertise to other countries. Today, Sino-American space cooperation is similarly desirable. It could improve ties as it did for the U.S. and Russia, de-escalate an emerging Sino-Russian axis in space, and serve as a bargaining chip to help sustain other areas of cooperation. While China and the U.S. seem to clash on virtually every issue, space, by its nature, is different. Orbit isn’t a high-ground that one can seize. Instead, space works like a commons, where for any one state or company to be able to operate safely, all have to act responsibly. We need peaceful cooperation to enjoy its benefits. One reason not to cooperate in space with a geopolitical rival is technology transfer. There are legitimate concerns that collaboration could lead to technology sharing that unfairly advances China. Indeed, in 2011, the U.S. Congress included a passage, known as the Wolf Amendment, in an appropriations bill, forbidding NASA from cooperating in any way with China for fear of technological theft or espionage. The reasoning was straightforward: The U.S. enjoys significant leadership in some space technologies, including satellites, and much of that technology is proprietary, shared with no other countries. In the area of human spaceflight, however, things are different. The U.S. has extensively shared the entire ISS program for decades with the fourteen partner nations, including Russia. If there ever were secrets there, they are secrets no more. In fact, Russia and the U.S. as partners saved the day between 2011, after the space shuttles were grounded, and 2021, when the U.S. regained the ability to transport astronauts to space. During that decade, Russia’s Soyuz spacecraft served as the only way to get crews to and from the station. At the same time, uncrewed American resupply ships similarly helped keep the ISS viable when the Russian Soyuz fleet was grounded following mishaps. China has developed and proven a very successful human spaceflight program; adding their launch and spacecraft capability to the partnership would strengthen the overall mission. In order for China and the U.S. to work together in space, some things would have to change. First, the Wolf Amendment would have to be repealed—nothing meaningful can happen until that goes. Cooperation might then begin in lower profile areas such as sharing remote sensing data and reducing orbital debris. The United States and Europe have led the way with Landsat and Copernicus satellite programs providing free images of Earth that can be used to understand changes to our environment. The Chinese have yet to create a similar data share program for their Earth imaging systems—but they should. The United States and China could also discuss joint efforts to reduce the belt of space junk that circles the planet and threatens everyone’s satellites. Most importantly, cooperation could extend to joint human spaceflight missions; the US could invite China to conduct a crewed visit to the ISS, or to join in the human exploration of the Moon, targeted to happen in this decade and which both nations are now working on separately; the goal would be a joint Moon base rather than a space race. For decades, space travel has provided an opportunity for humans to see our world differently. Apollo 11 astronaut Michael Collins said, “The thing that really surprised me was that the Earth projected an air of fragility.” Chinese astronauts, since Yang Liwei’s first flight 18 years ago, have surely had a similar experience gazing down at our planet. Cooperating in space can give the United States and China the opportunity to change their thinking together. Bold American leadership can be a leveraged move in reducing tensions, as it was in keeping the Cold War cold—a win for all nations and our shared, blue-green planet.

#### US-China Relations solves laundry list of existential threats.

Paulson 15, H. M. "Dealing with China: An insider unmasks the new economic superpower. Hachette Book Group." Inc.: All Books (2015). (Former US Treasury Secretary)//Elmer

One crisp day in early March 2014, I found myself sitting in a sleek conference room high above Boston Harbor taking questions from a group of financial executives. These men and women worked for a range of institutions that managed well over $3 trillion of financial assets, including the personal savings and pension funds of millions of Americans. They were keen to learn as much as they could about the Chinese economy. Was it about to hit the wall? Was I worried about a real estate bubble? How fragile was the country's financial system? Was the government serious about dealing with China's environmental problems? One fellow had a more personal question for me. "Hank," he said. "You're a real patriot. Why are you helping China?" The question pulled me up short. Three years before, when I first 'c began planning to write this book, I don't think I would have been asked anything like that at a meeting of sophisticated financiers. They would J have accepted that helping China to reform its economy, open its markets, protect its environment, and improve the quality of life of its people-all things I have been working on-would bring economic and strategic benefits to the U.S. as well. But that viewpoint has been changing as China has emerged as our biggest, most formidable economic competitor since the end of World War II and has started flexing its newfound military muscle in unsettling ways. As a result, many Americans, from all walks of life, have begun to view China with growing apprehension and resentment. Some would now prefer confrontation to cooperation. I understand these sentiments. Partly they are a function of China's choices and actions, and partly they are born of frustration with the recent economic troubles of the United States. I've spent a fair number of pages explaining how China must carry out meaningful economic reforms if it expects to continue its amazing success story. These arguments make sense for China and its people. But why should an American care? Why should we root for China to succeed? Shouldn't we instead be hoping that this ungainly giant stumbles, if only to slow down its daunting economic and military growth? In coming years China's weight and influence in the world, already substantial, is likely to begin to rival our own. Why take the chance now of helping the Chinese deal with so many of their problems and challenges? Why aid a competitor? The answer is simple: we should do so because it is more than ever in America's own self-interest that we do. To begin with, just about every major global challenge we face-from economic and environmental issues to food and energy security to nuclear proliferation and terrorism-will be easier to solve if the world's two most important economic powers can act in complementary ways. But these challenges will be almost impossible to address if the U.S. and China work at cross-purposes. If we want to benefit from an expanding global economy, we need the most dynamic growth engines, like China's, to thrive. If we want to prevent the worst climate change outcomes and to preserve our fragile global ecosystems, we need China to solve its massive environmental problems at home and adopt better practices abroad. If we want to keep diseases from our shores, we need Chinaand other countries to use the very best methods to prevent and halt epidemics. If we want to stem the spread of dangerous weapons to those who might harm our citizens, we need nations, including China, to work together to end illicit trafficking. If we want all these things to happen, we must be proactive, frank, and at times forceful with the Chinese while seeking ways to cooperate, to develop complementary policies, and to work to more fully integrate them into a rules-based global order. If we attempt to exclude, ignore, or weaken China, we limit our ability to influence choices made by its leaders and risk turning the worst-case scenarios of China skeptics into a self-fulfilling reality.

Don’t give them 1AR theory

1. It’s a bad norm because we have less speeches to have the theory debate – only three speeches
2. Leads to intervention since any counter interps or responses to the counter interps are new in the 2
3. Unfair since we only get one speech to respond so the 2ar can spin the shell and we can’t do anything about it

# 3

#### Xi’s regime is stable now, but its success depends on strong growth and private sector development.

**Mitter and Johnson 21** [Rana Mitter and Elsbeth Johnson, [Rana Mitter](https://hbr.org/search?term=rana%20mitter&search_type=search-all) is a professor of the history and politics of modern China at Oxford. [Elsbeth Johnson](https://hbr.org/search?term=elsbeth%20johnson&search_type=search-all), formerly the strategy director for Prudential PLC’s Asian business, is a senior lecturer at MIT’s Sloan School of Management and the founder of SystemShift, a consulting firm. May-June 2021, "What the West Gets Wrong About China," Harvard Business Review, [https://hbr.org/2021/05/what-the-west-gets-wrong-about-china accessed 12/14/21](https://hbr.org/2021/05/what-the-west-gets-wrong-about-china%20accessed%2012/14/21)] Adam

In China, however, growth has come in the context of stable communist rule, suggesting that democracy and growth are not inevitably mutually dependent. In fact, many Chinese believe that the country’s recent economic achievements—large-scale poverty reduction, huge infrastructure investment, and development as a world-class tech innovator—have come about because of, not despite, China’s authoritarian form of government. Its aggressive handling of Covid-19—in sharp contrast to that of many Western countries with higher death rates and later, less-stringent lockdowns—has, if anything, reinforced that view.

China has also defied predictions that its authoritarianism would inhibit its capacity to [innovate](https://hbr.org/2011/06/what-the-west-doesnt-get-about-china). It is a global leader in AI, biotech, and space exploration. Some of its technological successes have been driven by market forces: People wanted to buy goods or communicate more easily, and the likes of Alibaba and Tencent have helped them do just that. But much of the technological progress has come from a highly innovative and well-funded military that has invested heavily in China’s burgeoning new industries. This, of course, mirrors the role of U.S. defense and intelligence spending in the development of Silicon Valley. But in China the consumer applications have come faster, making more obvious the link between government investment and products and services that benefit individuals. That’s why ordinary Chinese people see Chinese companies such as Alibaba, Huawei, and TikTok as sources of national pride—international vanguards of Chinese success—rather than simply sources of jobs or GDP, as they might be viewed in the West.

Thus July 2020 polling data from the Ash Center at Harvard’s Kennedy School of Government revealed 95% satisfaction with the Beijing government among Chinese citizens. Our own experiences on the ground in China confirm this. Most ordinary people we meet don’t feel that the authoritarian state is solely oppressive, although it can be that; for them it also provides opportunity. A cleaner in Chongqing now owns several apartments because the CCP reformed property laws. A Shanghai journalist is paid by her state-controlled magazine to fly around the world for stories on global lifestyle trends. A young student in Nanjing can study propulsion physics at Beijing’s Tsinghua University thanks to social mobility and the party’s significant investment in scientific research.

#### Xi has committed to the commercial space industry as the linchpin of China’s rise – the plan is seen as a complete 180

**Patel 21** [Neel V. Patel, Neel is a space reporter for MIT Technology Review. 1-21-2021, "China’s surging private space industry is out to challenge the US," MIT Technology Review, <https://www.technologyreview.com/2021/01/21/1016513/china-private-commercial-space-industry-dominance/> accessed 12/14/21] Adam

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](https://archive.md/o/bc9l4/www.cpppc.org/en/zy/994006.jhtml) 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](https://archive.md/o/bc9l4/https:/www.ida.org/-/media/feature/publications/e/ev/evaluation-of-chinas-commercial-space-sector/d-10873.ashx). 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](https://archive.md/o/bc9l4/https:/spacenews.com/spacety-releases-first-sar-images/), 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.

Although China is taking inspiration from the US in building out its private industry, the nature of the Chinese state also means these new companies face obstacles that their rivals in the West don’t have to worry about. While Chinese companies may look private on paper, they must still submit to government guidance and control, and accept some level of interference. It may be difficult for them to make a case to potential overseas customers that they are independent. The distinction between companies that are truly private and those that are more or less state actors is still quite fuzzy, especially if the government is a frequent customer. “That could still lead to a lack of trust from other partners,” says Goswami. It doesn’t help that the government itself is often [very cagey about what its national program is even up to](https://archive.md/o/bc9l4/https:/www.bbc.com/news/science-environment-54076895).

And Hines adds that it’s not always clear exactly how separate these companies are from, say, the People’s Liberation Army, given the historical ties between the space and defense sectors. “Some of these things will pose significant hurdles for the commercial space sector as it tries to expand,” he says.

#### Shifts in regime perception threatens CCP’s legitimacy from nationalist hardliners

Weiss 19 Jessica Weiss 1-29-2019 “Authoritarian Audiences, Rhetoric, and Propaganda in International Crises: Evidence from China” <http://www.jessicachenweiss.com/uploads/3/0/6/3/30636001/19-01-24-elite-statements-isq-ca.pdf> (Associate Professor of Government at Cornell University)//Elmer

Public support—or the appearance of it—matters to many autocracies. As Ithiel de Sola Pool writes, modern dictatorships are “highly conscious of public opinion and make major efforts to affect it.”6 Mao Zedong told his comrades: “When you make revolution, you must first manage public opinion.”7 Because autocracies often rely on **nationalist mythmaking**,8 success or failure in defending the national honor in international crises could burnish the leadership’s patriotic credentials or spark opposition. **Shared outrage at the regime’s foreign policy failures could galvanize street protests or elite fissures, creating intraparty upheaval** or inviting military officers to step in to restore order. Fearing a domestic backlash, authoritarian leaders may feel compelled to take a tough international stance. Although authoritarian leaders are rarely held accountable to public opinion through free and fair elections, fears of popular unrest and irregular ouster often weigh heavily on autocrats seeking to maximize their tenure in office. Considering the harsh consequences that authoritarian elites face if pushed out of office, even a small increase in the probability of ouster could alter authoritarian incentives in international crises.9 A history of nationalist uprisings make Chinese citizens and leaders especially aware of the linkage between international disputes and domestic unrest. The weakness of the PRC’s predecessor in defending Chinese sovereignty at the Paris Peace Conference in 1919 galvanized protests and a general strike, forcing the government to sack three officials and reject the Treaty of Versailles, which awarded territories in China to Japan. These precedents have made Chinese officials particularly sensitive to the appearance of hewing to public opinion. As the People’s Daily chief editor wrote: “History and reality have shown us that public opinion and regime safety are inseparable.”10 One Chinese scholar even claimed: “the Chinese government probably knows the public’s opinion better and reacts to it more directly than even the U.S. government.”11

#### Lash-out causes SCS, Philippines war, Vietnam war, India border conflicts, ECS, Japan War, Taiwan invasion, and US-China War.

Cole 14 J. Michael Cole 7-10-2014 “Where Would Beijing Use External Distractions?” <http://thediplomat.com/2014/07/where-would-beijing-use-external-distractions/> (former analyst at the Canadian Security Intelligence Service, columnist for The Diplomat and a contributor for The National Interest)//Elmer

Throughout history, embattled governments have often resorted to external distractions to tap into a restive population’s nationalist sentiment and thereby release, or redirect, pressures that otherwise could have been turned against those in power. Authoritarian regimes in particular, which deny their citizens the right to punish the authorities through retributive democracy — that is, elections — have used this device to ensure their survival during periods of domestic upheaval or financial crisis. Would the Chinese Communist Party (CCP), whose legitimacy is so contingent on social stability and economic growth, go down the same path if it felt that its hold on power were threatened by domestic instability? Building on the premise that the many contradictions that are inherent to the extraordinarily complex Chinese experiment, and rampant corruption that undermines stability, will eventually catch up with the CCP, we can legitimately ask how, and where, Beijing could manufacture external crises with opponents against whom nationalist fervor, a major characteristic of contemporary China, can be channeled. In past decades, the CCP has on several occasions tapped into public outrage to distract a disgruntled population, often by encouraging (and when necessary containing) protests against external opponents, namely Japan and the United States. While serving as a convenient outlet, domestic protests, even when they turned violent (e.g., attacks on Japanese manufacturers), were about as far as the CCP would allow. This self-imposed restraint, which was prevalent during the 1980s, 1990s and 2000s, was a function both of China’s focus on building its economy (contingent on stable relations with its neighbors) and perceived military weakness. Since then, China has established itself as the world’s second-largest economy and now deploys, thanks to more than a decade of double-digit defense budget growth, a first-rate modern military. Those impressive achievements have, however, fueled Chinese nationalism, which has increasingly approached the dangerous zone of hubris. For many, China is now a rightful regional hegemon demanding respect, which if denied can — and should — be met with threats, if not the application of force. While it might be tempting to attribute China’s recent assertiveness in the South and East China Seas to the emergence of Xi Jinping, Xi alone cannot make all the decisions; nationalism is a component that cannot be dissociated from this new phase in Chinese expressions of its power. As then-Chinese foreign minister Yang Jiechi is said to have told his counterparts at a tense regional forum in Hanoi in 2010, “There is one basic difference among us. China is a big state and you are smaller countries.” This newfound assertiveness within its backyard thus makes it more feasible that, in times of serious trouble at home, the Chinese leadership could seek to deflect potentially destabilizing anger by exploiting some external distraction. Doing so is always a calculated risk, and sometimes the gambit fails, as Slobodan Milosevic learned the hard way when he tapped into the furies of nationalism to appease mounting public discontent with his bungled economic policies. For an external distraction to achieve its objective (that is, taking attention away from domestic issues by redirecting anger at an outside actor), it must not result in failure or military defeat. In other words, except for the most extreme circumstances, such as the imminent collapse of a regime, the decision to externalize a domestic crisis is a rational one: adventurism must be certain to achieve success, which in turn will translate into political gains for the embattled regime. Risk-taking is therefore proportional to the seriousness of the destabilizing forces within. Rule No. 1 for External Distractions: The greater the domestic instability, the more risks a regime will be willing to take, given that the scope and, above all, the symbolism of the victory in an external scenario must also be greater. With this in mind, we can then ask which external distraction scenarios would Beijing be the most likely to turn to should domestic disturbances compel it to do so. That is not to say that anything like this will happen anytime soon. It is nevertheless not unreasonable to imagine such a possibility. The intensifying crackdown on critics of the CCP, the detention of lawyers, journalists and activists, unrest in Xinjiang, random acts of terrorism, accrued censorship — all point to growing instability. What follows is a very succinct (and by no means exhaustive) list of disputes, in descending order of likelihood, which Beijing could use for external distraction. 1. South China Sea The South China Sea, an area where China is embroiled in several territorial disputes with smaller claimants, is ripe for exploitation as an external distraction. Nationalist sentiment, along with the sense that the entire body of water is part of China’s indivisible territory and therefore a “core interest,” are sufficient enough to foster a will to fight should some “incident,” timed to counter unrest back home, force China to react. Barring a U.S. intervention, which for the time being seems unlikely, the People’s Liberation Army (PLA) has both the numerical and qualitative advantage against any would be opponent or combination thereof. The Philippines and Vietnam, two countries which have skirmished with China in recent years, are the likeliest candidates for external distractions, as the costs of a brief conflict would be low and the likelihood of military success fairly high. For a quick popularity boost and low-risk distraction, these opponents would best serve Beijing’s interests. 2. Jammu and Kashmir, Arunachal Pradesh Although Beijing claims that it is ready for a settlement of its longstanding territorial disputes with India, the areas remain ripe for the re-ignition of conflict. New Delhi accuses China of occupying 38,000 square kilometers in Jammu and Kashmir, and Beijing lays claim to more than 90,000 square kilometers of territory inside the Indian state of Arunachal Pradesh. A few factors militate against the suitability of those territories for an external distraction, chief among them the difficult access in winter, and the strength of the Indian military, which would pose a greater risk to PLA troops than those of Vietnam or the Philippines in the previous scenario. Nevertheless, memories of China’s routing of the Indian military in the Sino-Indian War of 1962 could embolden Beijing. Though challenging, the PLA would be expected to prevail in a limited conflict with Indian forces, and China would have taken on a greater regional power than Vietnam or the Philippines, with everything that this entails in terms of political benefits back home. 3. East China Sea and Japan Sparking a war with Japan, presumably over the disputed Senkaku/Diaoyu islets, would represent a major escalation on Beijing’s part. Assuming that rational actors are in control in Beijing, a decision to begin hostilities with the modern and skilled Japan Self-Defense Forces would only be made if domestic instability were serious enough. Still, high resentment of the Japanese stemming from Japanese aggression before and during World War II and the competitive nature of the bilateral relationship make Japan the perfect candidate for an external distraction. More than any other conflict, hostilities with Japan would rally ordinary Chinese to the flag and tap into hatred that the leadership knows it could exploit if necessary. Although the chances of prevailing would be much smaller than in the South China Sea or Indian scenarios (especially if the U.S. became involved), the dividends of victory against Japan — anything from teaching Tokyo a lesson to redressing historical injustices — could be such as to become a major factor in appeasing major domestic unrest in China. Unless the CCP were on the brink of collapse, it is unlikely that the leadership in Beijing would escalate tensions with Japan beyond the disputed islets. In other words, military action probably would not extend to other parts of Japan’s territory, unless, of course, the conflict widened. Containing the conflict by limiting it to the Senkaku/Diaoyus would therefore be part of Beijing’s strategy. 4. Taiwan The “reunification” of Taiwan remains a so-called “core interest” of China and a major component of the CCP’s legitimacy with the public. Despite rapprochement in recent years, a substantial component of the PLA remains committed to a Taiwan contingency. Although the risks of war in the Taiwan Strait are low at the moment, China never shelved its plans to annex the island by force if necessary, and has vowed to do so should Taipei seek to unilaterally change the status quo by declaring de jure independence. Under Xi, Beijing has also signaled that while it is willing to be patient with Taiwanese and would prefer to use financial incentives to gradually consolidate its grip on Taiwan, it does not intend to be patient forever. In other words, foot-dragging on Taiwan’s part, or the election of a political party that is less amenable to rapprochement than the ruling Kuomintang (KMT), could prompt Beijing to choose a more aggressive course of action. Serious unrest on the island could also provide Beijing with the “justification” it needs to involve the PLA, which would be deployed to “protect” Taiwanese “compatriots.” Given that definitions of progress on “reunification” are very much Beijing’s to decide, any incident could theoretically warrant the use of force against Taiwan, especially if major domestic unrest compelled the CCP to seek an external distraction. Militating against such a decision is the fact that anything short of a full invasion of the island would probably forever kill any chance of “peaceful unification” with Taiwan, as the 1995-1996 Taiwan Strait missile crisis demonstrated. A limited military campaign against Taiwan is therefore probably not a good option for an external distraction, as the backlash against aggression would undo years of calibrated Taiwan policy and destroy hopes of unification, which would greatly discredit the CCP with the Chinese public, not to mention the PLA. A full invasion of Taiwan would then provide greater chances of success, at least if we measure success by its impact on public opinion amid serious unrest in China. However, the growing power imbalance in the Taiwan Strait notwithstanding, invading the island would be an extraordinarily difficult — and costly — task; talk of a “quick, clear war” remains just that, and pacifying the island would be a formidable challenge. Should the conflict drag on, as it most certainly would, whatever advantage the CCP may have accumulated by tapping into nationalist sentiment could dwindle and further contribute to resentment against the party. Consequently, unless the CCP were on the brink of collapse, Taiwan would be an extremely poor candidate for external distraction, worse even than Japan, where the chances of success in a limited campaign are higher. 5. United States The last, and least likely, candidate for external distraction would be for the PLA to turn its sights on U.S. forces in the Pacific. For obvious reasons, such a course of action would be a last resort, a last-ditch effort to prevent the complete collapse of the CCP due to domestic factors. The chances of prevailing in a direct military confrontation with U.S. forces in the region would be next to nil. A decision to attack the U.S. would qualify as irrational, a departure from the realm of calculations that would buttress decisions in any of the alternative scenarios discussed above. Still there are examples of countries that embarked on what, in hindsight, can only be described as suicidal adventures by attacking a much more powerful enemy. Japan demonstrated that this is possible during World War II. A likelier source of conflict between the PLA and U.S. forces would be indirect, such as U.S. involvement in limited hostilities between China and any of the countries mentioned above (with Japan and Taiwan as the likeliest). As the PLA is configured not to take on the U.S. military directly but rather asymmetrically, China would increase its chances of scoring domestic points by playing to its strengths — by inflicting damage on U.S. forces with its anti-access/area-denial, or A2/AD. Sinking an aircraft carrier on its way to the East China Sea or towards the Taiwan Strait, for example, could do wonders in terms of public opinion and provide temporary cover for an embattled CCP. Ultimately, however, the costs of taking on the U.S. military, added to the extremely low likelihood that Chinese troops could secure the kind of victory that would be necessary to rescue the CCP from internal strife, mean that the U.S. is an especially bad candidate for external distraction.

# 4

#### China’s economy is on the brink.

Lopez 21 Linette Lopez 10-24-2021 "If China's economy keeps stumbling, it won't just take down Beijing - the whoel world will collapse with it" <https://archive.md/M4qjY#selection-2241.0-2250.1> (Linette is the senior finance correspondent at Business Insider, writing a combination of opinions and analysis. She joined BI in the summer of 2011 after graduating from Columbia University's School of Journalism.)//Elmer

**China's economy** — the 2nd-largest in the world — **is teetering on the brink of disaster**. Since this spring, Beijing has **canceled** initial **public offerings**, **fined tech companies** billions for antitrust violations, forcibly **shut down** China's entire for-profit **education industry**, and **sent CEOs running** for the exits to avoid the government's ire. Even more dire, the Chinese megadeveloper Evergrande recently started missing payments on its more than $300 billion in debt, shaking global markets. The convulsions have woken the world up to a startling new possibility — that Beijing may be willing to allow some of its private corporate behemoths to collapse in a bid to reshape the economic model that made China a superpower. The **upheaval**, spanning multiple industries and vast swaths of the country, **is** the result of one giant issue: **China's inability to** **borrow or buy** its **way out of its current economic crisis**. **For decades**, the country **relied on cheap labor** and eye-popping amounts of debt, handed out by government-owned banks, to fuel economic growth — pouring money into massive apartment developments, factories, bridges, and other projects at lightning speed. **Now** the **country** **needs people to actually use**, **and pay for**, **everything that's been built**. But the **bulk of China's population lacks** the **income needed to shift the economy** from one driven by state investments to one sustained by consumer spending.

#### Robust Chinese Space Industry key to Economic rejuvenation.

Goswami 19 Namrata Goswami 2019 "What China Wants in Outer Space" <https://www.thecairoreview.com/wp-content/uploads/2019/05/cr33-global-forum.pdf> (Dr. Namrata Goswami is an independent scholar on space policy, great power politics, and ethnic conflicts. She was subject matter expert in international affairs with the Futures Laboratory, Alabama, U.S., and guest lecturer, India Today Class, Emory University. After earning her Ph.D. in international relations from Jawaharlal Nehru University, New Delhi, she worked as research fellow at the Institute for Defence Studies and Analyses, New Delhi. She has been a visiting fellow at Peace Research Institute, Oslo, Norway; La Trobe University, Melbourne, Australia; and University of Heidelberg, Germany.)//Elmer

Beijing has made it clear that its ambitions for China’s space program are an integral part of its long-term vision for national rejuvenation. In his 2017 address to the Chinese Communist Party’s nineteenth National Congress, President Xi Jinping said that the Chinese space program will play a critical role in elevating the country to a “fully developed, rich, and powerful nation” by 2049—the year the People’s Republic of China celebrates its one-hundredth anniversary. For China, investing in outer space goes beyond simply achieving prestige and reputation—as opposed to the “flags and footprints”-based moon race between the United States and the Soviet Union during the Cold War. Instead, China aims to establish a permanent space presence, which would offer long-term economic benefits. The global space economy today is worth $350 billion, but is predicted to grow to $2.7 trillion by 2040. The economic returns from future mining of space-based resources like titanium, platinum, water-ice, thorium, and iron-ore far exceed the trillion-dollar mark. Consequently, the Chinese are working to establish a base on the moon with the industrial capacity to build spacecrafts using lunar resources. This would drastically reduce the cost of interplanetary travel. A lunar base would serve the distinctive purpose of providing a testing ground for human space settlement, and building capacity for China’s long-term space ambitions. Beijing’s Lunar Dreams Following the landing of Chang’e 4 (China’s fourth lunar exploration mission) on the far side of the moon on January 3, the China National Space Administration (CNSA) announced follow-on missions to augment the state’s space capacity. By this year’s end, China will launch Chang’e 5 to bring lunar samples back to Earth, followed by Chang’e 6 (2024) to bring samples specifically from the moon’s south pole. Chang’e 7 (2030) will survey the south pole’s composition and Chang’e 8 (2035) will test key technologies like 3D printing to lay the groundwork for the construction of a research station. The moon not only strengthens China’s space-faring capacities but also has resources like iron-ore and water that can be utilized for space-based manufacturing. Meanwhile, a lunar base offers some short-term strategic dominance in cislunar space (the area between the Earth and the moon). Another of China’s major space ambitions is its investment in SpaceBased Solar Power (SBSP) to build a space solar station thirty-six thousand kilometers above Earth. Some Chinese leaders stress that dwindling fossil fuel resources on Earth will make solar energy the most important future energy source. China started construction on the world’s first SBSP experimental plant in Chongqing earlier this year. If successful, the technology would allow China to fully power its lunar base and augment space mining operations. Space mining involves developing technologies to harvest resources from asteroids and the moon—a highly lucrative prospect. For instance, a single asteroid called 2011 UW158, which passed by Earth in 2015, was estimated to contain 5 trillion dollars’ worth of platinum. While still roughly a decade off, space mining is fast becoming a reality. Countries like the United States and Luxembourg have already passed legislation enabling private companies to begin exploration and operations.

#### Chinese Economic Decline spills-over globally.

Rogoff 18 Kennetth Rogoff 11-7-2018 "The Global Impact of a Chinese Recession" <https://www.project-syndicate.org/commentary/global-impact-of-chinese-recession-by-kenneth-rogoff-2018-11?barrier=accesspaylog> (Professor of Economics and Public Policy at Harvard University and recipient of the 2011 Deutsche Bank Prize in Financial Economics, was the chief economist of the International Monetary Fund from 2001 to 2003.)//Elmer

Most economic forecasts suggest that a recession in China will hurt everyone, but that the pain would be more regionally confined than would be the case for a deep recession in the United States. Unfortunately, that may be wishful thinking. CAMBRIDGE – When China finally has its inevitable growth recession – which will almost surely be amplified by a financial crisis, given the economy’s massive leverage – how will the rest of world be affected? With US President Donald Trump’s trade war hitting China just as growth was already slowing, this is no idle question. Typical estimates, for example those embodied in the International Monetary Fund’s assessments of country risk, suggest that an economic slowdown in China will hurt everyone. But the acute pain, according to the IMF, will be more regionally concentrated and confined than would be the case for a deep recession in the United States. Unfortunately, this might be wishful thinking. First, the effect on international capital markets could be vastly greater than Chinese capital market linkages would suggest. However jittery global investors may be about prospects for profit growth, a hit to Chinese growth would make things a lot worse. Although it is true that the US is still by far the biggest importer of final consumption goods (a large share of Chinese manufacturing imports are intermediate goods that end up being embodied in exports to the US and Europe), foreign firms nonetheless still enjoy huge profits on sales in China. Investors today are also concerned about rising interest rates, which not only put a damper on consumption and investment, but also reduce the market value of companies (particularly tech firms) whose valuations depend heavily on profit growth far in the future. A Chinese recession could again make the situation worse. I appreciate the usual Keynesian thinking that if any economy anywhere slows, this lowers world aggregate demand, and therefore puts downward pressure on global interest rates. But modern thinking is more nuanced. High Asian saving rates over the past two decades have been a significant factor in the low overall level of real (inflation-adjusted) interest rates in both the United States and Europe, thanks to the fact that underdeveloped Asian capital markets simply cannot constructively absorb the surplus savings. Former US Federal Reserve chair Ben Bernanke famously characterized this much-studied phenomenon as a key component of the “global savings glut.” Thus, instead of leading to lower global real interest rates, a Chinese slowdown that spreads across Asia could paradoxically lead to higher interest rates elsewhere – especially if a second Asian financial crisis leads to a sharp draw-down of central bank reserves. Thus, for global capital markets, a Chinese recession could easily prove to be a double whammy. As bad as a slowdown in exports to China would be for many countries, a significant rise in global interest rates would be much worse. Eurozone leaders, particularly German Chancellor Angela Merkel, get less credit than they deserve for holding together the politically and economically fragile single currency against steep economic and political odds. But their task would have been well-nigh impossible but for the ultra-low global interest rates that have allowed politically paralyzed eurozone officials to skirt needed debt write-downs and restructurings in the periphery. When the advanced countries had their financial crisis a decade ago, emerging markets recovered relatively quickly, thanks to low debt levels and strong commodity prices. Today, however, debt levels have risen significantly, and a sharp rise in global real interest rates would almost certainly extend today’s brewing crises beyond the handful of countries (including Argentina and Turkey) that have already been hit. Nor is the US immune. For the moment, the US can finance its trillion-dollar deficits at relatively low cost. But the relatively short-term duration of its borrowing – under four years if one integrates the Treasury and Federal Reserve balance sheets – means that a rise in interest rates would soon cause debt service to crowd out needed expenditures in other areas. At the same time, Trump’s trade war also threatens to undermine the US economy’s dynamism. Its somewhat arbitrary and politically driven nature makes it at least as harmful to US growth as the regulations Trump has so proudly eliminated. Those who assumed that Trump’s stance on trade was mostly campaign bluster should be worried. The good news is that trade negotiations often seem intractable until the eleventh hour. The US and China could reach an agreement before Trump’s punitive tariffs go into effect on January 1. Such an agreement, one hopes, would reflect a maturing of China’s attitude toward intellectual property rights – akin to what occurred in the US during the late nineteenth century. (In America’s high growth years, US entrepreneurs often thought little of pilfering patented inventions from the United Kingdom.) A recession in China, amplified by a financial crisis, would constitute the third leg of the debt supercycle that began in the US in 2008 and moved to Europe in 2010. Up to this point, the Chinese authorities have done a remarkable job in postponing the inevitable slowdown. Unfortunately, when the downturn arrives, the world is likely to discover that China’s economy matters even more than most people thought.

#### Decline cascades – nuclear war

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Various scholars and institutions regard global social instability as the greatest threat facing this decade. The catalyst has been postulated to be a Second Great Depression which, in turn, will have profound implications for global security and national integrity. This paper, written from a broad systems perspective, illustrates how emerging risks are getting more complex and intertwined; blurring boundaries between the economic, environmental, geopolitical, societal and technological taxonomy used by the World Economic Forum for its annual global risk forecasts. Tight couplings in our global systems have also enabled risks accrued in one area to snowball into a full-blown crisis elsewhere. The COVID-19 pandemic and its socioeconomic fallouts exemplify this systemic chain-reaction. Onceinexorable forces of globalization are rupturing as the current global system can no longer be sustained due to poor governance and runaway wealth fractionation. The coronavirus pandemic is also enabling Big Tech to expropriate the levers of governments and mass communications worldwide. This paper concludes by highlighting how this development poses a dilemma for security professionals. Key Words: Global Systems, Emergence, VUCA, COVID-9, Social Instability, Big Tech, Great Reset INTRODUCTION The new decade is witnessing rising volatility across global systems. Pick any random “system” today and chart out its trajectory: Are our education systems becoming more robust and affordable? What about food security? Are our healthcare systems improving? Are our pension systems sound? Wherever one looks, there are dark clouds gathering on a global horizon marked by volatility, uncertainty, complexity and ambiguity (VUCA). But what exactly is a global system? Our planet itself is an autonomous and selfsustaining mega-system, marked by periodic cycles and elemental vagaries. Human activities within however are not system isolates as our banking, utility, farming, healthcare and retail sectors etc. are increasingly entwined. Risks accrued in one system may cascade into an unforeseen crisis within and/or without (Choo, Smith & McCusker, 2007). Scholars call this phenomenon “emergence”; one where the behaviour of intersecting systems is determined by complex and largely invisible interactions at the substratum (Goldstein, 1999; Holland, 1998). The ongoing COVID-19 pandemic is a case in point. While experts remain divided over the source and morphology of the virus, the contagion has ramified into a global health crisis and supply chain nightmare. It is also tilting the geopolitical balance. China is the largest exporter of intermediate products, and had generated nearly 20% of global imports in 2015 alone (Cousin, 2020). The pharmaceutical sector is particularly vulnerable. Nearly “85% of medicines in the U.S. strategic national stockpile” sources components from China (Owens, 2020). An initial run on respiratory masks has now been eclipsed by rowdy queues at supermarkets and the bankruptcy of small businesses. The entire global population – save for major pockets such as Sweden, Belarus, Taiwan and Japan – have been subjected to cyclical lockdowns and quarantines. Never before in history have humans faced such a systemic, borderless calamity. COVID-19 represents a classic emergent crisis that necessitates real-time response and adaptivity in a real-time world, particularly since the global Just-in-Time (JIT) production and delivery system serves as both an enabler and vector for transboundary risks. From a systems thinking perspective, emerging risk management should therefore address a whole spectrum of activity across the economic, environmental, geopolitical, societal and technological (EEGST) taxonomy. Every emerging threat can be slotted into this taxonomy – a reason why it is used by the World Economic Forum (WEF) for its annual global risk exercises (Maavak, 2019a). As traditional forces of globalization unravel, security professionals should take cognizance of emerging threats through a systems thinking approach. METHODOLOGY An EEGST sectional breakdown was adopted to illustrate a sampling of extreme risks facing the world for the 2020-2030 decade. The transcendental quality of emerging risks, as outlined on Figure 1, below, was primarily informed by the following pillars of systems thinking (Rickards, 2020): • Diminishing diversity (or increasing homogeneity) of actors in the global system (Boli & Thomas, 1997; Meyer, 2000; Young et al, 2006); • Interconnections in the global system (Homer-Dixon et al, 2015; Lee & Preston, 2012); • Interactions of actors, events and components in the global system (Buldyrev et al, 2010; Bashan et al, 2013; Homer-Dixon et al, 2015); and • Adaptive qualities in particular systems (Bodin & Norberg, 2005; Scheffer et al, 2012) Since scholastic material on this topic remains somewhat inchoate, this paper buttresses many of its contentions through secondary (i.e. news/institutional) sources. ECONOMY According to Professor Stanislaw Drozdz (2018) of the Polish Academy of Sciences, “a global financial crash of a previously unprecedented scale is highly probable” by the mid- 2020s. This will lead to a trickle-down meltdown, impacting all areas of human activity. The economist John Mauldin (2018) similarly warns that the “2020s might be the worst decade in US history” and may lead to a Second Great Depression. Other forecasts are equally alarming. According to the International Institute of Finance, global debt may have surpassed $255 trillion by 2020 (IIF, 2019). Yet another study revealed that global debts and liabilities amounted to a staggering $2.5 quadrillion (Ausman, 2018). The reader should note that these figures were tabulated before the COVID-19 outbreak. The IMF singles out widening income inequality as the trigger for the next Great Depression (Georgieva, 2020). The wealthiest 1% now own more than twice as much wealth as 6.9 billion people (Coffey et al, 2020) and this chasm is widening with each passing month. COVID-19 had, in fact, boosted global billionaire wealth to an unprecedented $10.2 trillion by July 2020 (UBS-PWC, 2020). Global GDP, worth $88 trillion in 2019, may have contracted by 5.2% in 2020 (World Bank, 2020). As the Greek historian Plutarch warned in the 1st century AD: “An imbalance between rich and poor is the oldest and most fatal ailment of all republics” (Mauldin, 2014). The stability of a society, as Aristotle argued even earlier, depends on a robust middle element or middle class. At the rate the global middle class is facing catastrophic debt and unemployment levels, widespread social disaffection may morph into outright anarchy (Maavak, 2012; DCDC, 2007). Economic stressors, in transcendent VUCA fashion, may also induce radical geopolitical realignments. Bullions now carry more weight than NATO’s security guarantees in Eastern Europe. After Poland repatriated 100 tons of gold from the Bank of England in 2019, Slovakia, Serbia and Hungary quickly followed suit. According to former Slovak Premier Robert Fico, this erosion in regional trust was based on historical precedents – in particular the 1938 Munich Agreement which ceded Czechoslovakia’s Sudetenland to Nazi Germany. As Fico reiterated (Dudik & Tomek, 2019): “You can hardly trust even the closest allies after the Munich Agreement… I guarantee that if something happens, we won’t see a single gram of this (offshore-held) gold. Let’s do it (repatriation) as quickly as possible.” (Parenthesis added by author). President Aleksandar Vucic of Serbia (a non-NATO nation) justified his central bank’s gold-repatriation program by hinting at economic headwinds ahead: “We see in which direction the crisis in the world is moving” (Dudik & Tomek, 2019). Indeed, with two global Titanics – the United States and China – set on a collision course with a quadrillions-denominated iceberg in the middle, and a viral outbreak on its tip, the seismic ripples will be felt far, wide and for a considerable period. A reality check is nonetheless needed here: Can additional bullions realistically circumvallate the economies of 80 million plus peoples in these Eastern European nations, worth a collective $1.8 trillion by purchasing power parity? Gold however is a potent psychological symbol as it represents national sovereignty and economic reassurance in a potentially hyperinflationary world. The portents are clear: The current global economic system will be weakened by rising nationalism and autarkic demands. Much uncertainty remains ahead. Mauldin (2018) proposes the introduction of Old Testament-style debt jubilees to facilitate gradual national recoveries. The World Economic Forum, on the other hand, has long proposed a “Great Reset” by 2030; a socialist utopia where “you’ll own nothing and you’ll be happy” (WEF, 2016). In the final analysis, COVID-19 is not the root cause of the current global economic turmoil; it is merely an accelerant to a burning house of cards that was left smouldering since the 2008 Great Recession (Maavak, 2020a). We also see how the four main pillars of systems thinking (diversity, interconnectivity, interactivity and “adaptivity”) form the mise en scene in a VUCA decade. ENVIRONMENTAL What happens to the environment when our economies implode? Think of a debt-laden workforce at sensitive nuclear and chemical plants, along with a concomitant surge in industrial accidents? Economic stressors, workforce demoralization and rampant profiteering – rather than manmade climate change – arguably pose the biggest threats to the environment. In a WEF report, Buehler et al (2017) made the following pre-COVID-19 observation: The ILO estimates that the annual cost to the global economy from accidents and work-related diseases alone is a staggering $3 trillion. Moreover, a recent report suggests the world’s 3.2 billion workers are increasingly unwell, with the vast majority facing significant economic insecurity: 77% work in part-time, temporary, “vulnerable” or unpaid jobs. Shouldn’t this phenomenon be better categorized as a societal or economic risk rather than an environmental one? In line with the systems thinking approach, however, global risks can no longer be boxed into a taxonomical silo. Frazzled workforces may precipitate another Bhopal (1984), Chernobyl (1986), Deepwater Horizon (2010) or Flint water crisis (2014). These disasters were notably not the result of manmade climate change. Neither was the Fukushima nuclear disaster (2011) nor the Indian Ocean tsunami (2004). Indeed, the combustion of a long-overlooked cargo of 2,750 tonnes of ammonium nitrate had nearly levelled the city of Beirut, Lebanon, on Aug 4 2020. The explosion left 204 dead; 7,500 injured; US$15 billion in property damages; and an estimated 300,000 people homeless (Urbina, 2020). The environmental costs have yet to be adequately tabulated. Environmental disasters are more attributable to Black Swan events, systems breakdowns and corporate greed rather than to mundane human activity. Our JIT world aggravates the cascading potential of risks (Korowicz, 2012). Production and delivery delays, caused by the COVID-19 outbreak, will eventually require industrial overcompensation. This will further stress senior executives, workers, machines and a variety of computerized systems. The trickle-down effects will likely include substandard products, contaminated food and a general lowering in health and safety standards (Maavak, 2019a). Unpaid or demoralized sanitation workers may also resort to indiscriminate waste dumping. Many cities across the United States (and elsewhere in the world) are no longer recycling wastes due to prohibitive costs in the global corona-economy (Liacko, 2021). Even in good times, strict protocols on waste disposals were routinely ignored. While Sweden championed the global climate change narrative, its clothing flagship H&M was busy covering up toxic effluences disgorged by vendors along the Citarum River in Java, Indonesia. As a result, countless children among 14 million Indonesians straddling the “world’s most polluted river” began to suffer from dermatitis, intestinal problems, developmental disorders, renal failure, chronic bronchitis and cancer (DW, 2020). It is also in cauldrons like the Citarum River where pathogens may mutate with emergent ramifications. On an equally alarming note, depressed economic conditions have traditionally provided a waste disposal boon for organized crime elements. Throughout 1980s, the Calabriabased ‘Ndrangheta mafia – in collusion with governments in Europe and North America – began to dump radioactive wastes along the coast of Somalia. Reeling from pollution and revenue loss, Somali fisherman eventually resorted to mass piracy (Knaup, 2008). The coast of Somalia is now a maritime hotspot, and exemplifies an entwined form of economic-environmental-geopolitical-societal emergence. In a VUCA world, indiscriminate waste dumping can unexpectedly morph into a Black Hawk Down incident. The laws of unintended consequences are governed by actors, interconnections, interactions and adaptations in a system under study – as outlined in the methodology section. Environmentally-devastating industrial sabotages – whether by disgruntled workers, industrial competitors, ideological maniacs or terrorist groups – cannot be discounted in a VUCA world. Immiserated societies, in stark defiance of climate change diktats, may resort to dirty coal plants and wood stoves for survival. Interlinked ecosystems, particularly water resources, may be hijacked by nationalist sentiments. The environmental fallouts of critical infrastructure (CI) breakdowns loom like a Sword of Damocles over this decade. GEOPOLITICAL The primary catalyst behind WWII was the Great Depression. Since history often repeats itself, expect familiar bogeymen to reappear in societies roiling with impoverishment and ideological clefts. Anti-Semitism – a societal risk on its own – may reach alarming proportions in the West (Reuters, 2019), possibly forcing Israel to undertake reprisal operations inside allied nations. If that happens, how will affected nations react? Will security resources be reallocated to protect certain minorities (or the Top 1%) while larger segments of society are exposed to restive forces? Balloon effects like these present a classic VUCA problematic. Contemporary geopolitical risks include a possible Iran-Israel war; US-China military confrontation over Taiwan or the South China Sea; North Korean proliferation of nuclear and missile technologies; an India-Pakistan nuclear war; an Iranian closure of the Straits of Hormuz; fundamentalist-driven implosion in the Islamic world; or a nuclear confrontation between NATO and Russia. Fears that the Jan 3 2020 assassination of Iranian Maj. Gen. Qasem Soleimani might lead to WWIII were grossly overblown. From a systems perspective, the killing of Soleimani did not fundamentally change the actor-interconnection-interaction adaptivity equation in the Middle East. Soleimani was simply a cog who got replaced.

# case

#### Overview – the aff has no solvency – at best, even if they solve for China private sector they a) can’t boost US space industry which their autry card says is necessary and b) can’t account for china public sector. No solvency for the second advantage – misperception can still happen with other countries – their bowman evidence is literally about Russia

DAs happen before heg stuff

### Advantage

#### China has already leapfrogged the U.S in outer space influence

**Jennings 21** [Ralph Jennings, Ralph Jennings has covered news in China, Taiwan, and Southeast Asia for the past 14 years. 10-25-2021, "In China-US Space Race, Beijing Uses Space Diplomacy," VOA, [https://www.voanews.com/a/in-china-us-space-race-beijing-uses-space-diplomacy/6284826.html accessed 12/10/21](https://www.voanews.com/a/in-china-us-space-race-beijing-uses-space-diplomacy/6284826.html%20accessed%2012/10/21)] Adam

SAN FRANCISCO, CALIF. — China’s is extending its space program to other countries in ways that its superpower rival, the United States, finds hard to match and that stand to isolate the U.S. on earth, experts say. The vehicle propelling Beijing’s international plans for space diplomacy, the Shenzhou-13, blasted off Friday with a crew of three onboard. The spacecraft is the core module of China's space station and will stay in space for six months. State-run Xinhua News Agency said this journey begins the longest spaceflight ever for China. The crew will check all space station systems and help complete its construction by the end of next year. The space station will become a “platform for deeper international cooperation” and “welcome” foreign astronauts, the Beijing-based China Daily news website said. “My sense is that this is good PR for China,” said Marco Cáceres, director of space studies at the Teal Group market analysis firm. “Already, you see that there is a space race developing between the U.S. and China.” China launched its first satellite in 1970 and put its first astronaut in space in 2003, becoming the world’s third nation, after Russia and the United States, to do so. U.S. officials, among others, worry that China is looking to space for military use and would need to get congressional approval for any Sino-American space cooperation. Sino-foreign space cooperation Experts say China’s outreach to other countries goes beyond PR. China builds high-end satellites for developing countries and shares satellite data to help with relief work after natural disasters. In the 1990s, China and Brazil jointly developed remote sensing satellites, as Brazil was willing to share its technology then with China, said Yun Sun, co-director of the East Asia program at the Stimson Center in Washington. As of 2008, China has signed space-related cooperation agreements with Argentina, Brazil, Canada, France, Malaysia, Pakistan, Russia, Ukraine and the European Commission, [NASA](https://www.nasa.gov/pdf/214655main_SpeceEx08-Slides_Jin_final.pdf) said. Last year, Chinese ally Pakistan became the first full military partner eligible to use Beijing’s BeiDou navigation satellite. China offered remote sensing data to Japan after its 2011 tsunami and has given images to Australia for wildfire damage surveys, Sun said. Chinese satellites have provided free earth imagery to developing countries, she added. “It sounds like the data collected by these satellites are quite a popular or needed data for many countries,” Sun said. “So, for developing countries who don’t have the access to commercial satellites or information to be shared by Western countries, then China provides a useful alternative.” Russia and China tentatively agreed in September to open a joint lunar research base, making both sides more influential. China also sells launch services abroad, said Richard Bitzinger, a U.S.-based visiting senior fellow at the S. Rajaratnam School of International Studies in Singapore. China is reliable, open to sharing technology and positioned to “undercut the competition,” he said. Bitzinger said partner nations might see joint space exploitation as a “logical next step.” “I think more than anything, what they’re trying to say is, ‘We’re the low-budget provider. We’re the no-questions-asked guy. We’re happy to treat you more as equals than maybe the United States might’,” Bitzinger said. “For a lot of countries, there just isn’t really a political or strategic downside in dealing with the Chinese in these areas.” Cooperation has already begun between China and “some other countries” for selection and training of astronauts, China Daily said October 16. The newspaper said the China Manned Space Agency is working with the U.N. Office for Outer Space Affairs to invite certain U.N. members for scientific experiments at the Tianhe space station module. The Chinese space station is likely to do “thousands of experiments” in micro-gravity and could accept countries unable to reach the international space station, Cáceres said. “When China invites other countries to its own space station, then of course China will be the leader. So, it demonstrates China’s leadership willingness, as well as leadership capability and high-tech capabilities, to show that China can rival even the United States and Russia and the European Union — all of the most advanced industrial countries,” said Alexander Vuving, professor at the Daniel K. Inouye Asia-Pacific Center for Security Studies, in Hawaii. Chance to exceed the United States U.S. space programs are less “active” than China in helping poorer countries, Cáceres said, and its inactivity could be “hurt” as China shares outer space with other governments. Developing countries normally want the cheapest launch and satellite services, Bitzinger said. While they might prefer the quality of an American product, they could more likely afford one from China. That means the United Stated could “lose an advantage.” A 2011 U.S. law bars NASA from using its funds to engage the Chinese government and affiliated organizations without congressional and FBI approval. Washington believes Beijing to be “extremely aggressive in space,” Cáceres said. Washington’s role in the International Space Station has put its 60-year-old space program in contact with agencies from Russia, Europe, Japan and Canada. In 2013, the government removed satellite technology from a list of export-controlled items to help manufacturers compete overseas. But the United States prioritizes space competition less now than during the Cold War, Vuving said.

#### Space dominance pursuit fails, and destroys US SoPo

Mr. Chad M. Keller and Antulio J. Echevarria 18, PhD, Editor of The U.S. Army War College Quarterly, graduate of the U.S. Military Academy, the U.S. Army Command and General Staff College, the U.S. Army War College, and was a Visiting Research Fellow at Oxford University. He holds M.A. and Ph.D. degrees in history from Princeton University, and is currently working on a book on the American way of thinking about war for Cambridge University Press, “The Crumbling Sanctuary: Why America Must Restore Space Security,” https://publications.armywarcollege.edu/pubs/3606.pdf

Another assumption, which has been accepted by an increasing number of U.S. strategists, is that the weaponization of space is inevitable. 26 This assumption, based on comparisons to other domains which have all been weaponized, is unfounded and dangerous. Following the logic of this misguided supposition, game theory postulates there is a lasting military advantage to being the first to deploy space-based weapons.27 If America were first to weaponize space, any advantage would be fleeting. China and Russia already have the technology available to rapidly follow U.S. weaponization of space, and it would be in their interest to do so in order to ensure their continued access and to check possible U.S. space dominance.28 Furthermore, the weaponization of space is not inevitable.29 Weaponizing space is not in U.S. interests because it would destabilize the tenuous balance between militarization and peaceful use of space. Weaponization would also gravely reduce U.S. soft-power by harming relations with international partners and hindering America’s ability to lead in space. It would ultimately reduce space security while draining the treasury, since these weapons might never be able to deliver on their theoretical capabilities.30 Another assumption is that technology will one day make space-based weapons viable, rendering practical their theoretical capability to gain control over the Earth.31 However, technology cannot overcome the physical and financial realities of space, including the harsh operating environment, limited defense options, the number of space weapons required to achieve existing terrestrial capabilities, and the exorbitant costs of maintenance and resupply systems.

#### No China space war – the only scenario for conflict is Earthbound – Chinese military plans prove

Cheng 17 [Dean Cheng, Senior Research Fellow, Asian Studies Center, Davis Institute for National Security and Foreign Policy Heritage. The U.S.-Japan Alliance and Deterring Gray Zone Coercion in the Maritime, Cyber, and Space Domains. Chapter 6. Space Deterrence, the U.S.-Japan Alliance, and Asian Security: A U.S. Perspective. Rand Corporation. 2017]

But while there may be clashes in space, the actual source of any Sino-American conflict will remain earthbound, most likely stemming from tensions associated with the situation in the East China Sea, the Taiwan Strait, or the South China Sea. This suggests that U.S. and allied decisionmakers (both in Asia and Europe) should be focusing on deterring aggression in general, rather than concentrating primarily on trying to forestall actions in space. Indeed, there is little evidence that Chinese military planners are contemplating a conflict limited to space. While there may be actions against space systems, Chinese writings suggest that they would either be limited in nature, as part of a signaling and coercive effort, or else would be integrated with broader terrestrial military operations.

#### Heg is ineffective

Fettweis 17 – Associate Professor of Political Science at Tulane University (Christopher, “Unipolarity, Hegemony, and the New Peace,” *Security Studies*, 26:3, 423-451, 5-8-2017, http://dx.doi.org/10.1080/09636412.2017.1306394)//Elmer

Conflict and Hegemony by Region Even the most ardent supporters of the hegemonic-stability explanation do not contend that US influence extends equally to all corners of the globe. The United States has concentrated its policing in what George Kennan used to call “strong points,” or the most important parts of the world: Western Europe, the Pacific Rim, and Persian Gulf.64 By doing so, Washington may well have contributed more to great power peace than the overall global decline in warfare. If the former phenomenon contributed to the latter, by essentially providing a behavioral model for weaker states to emulate, then perhaps this lends some support to the hegemonic-stability case.65 During the Cold War, the United States played referee to a few intra-West squabbles, especially between Greece and Turkey, and provided Hobbesian reassurance to Germany’s nervous neighbors. Other, equally plausible explanations exist for stability in the first world, including the presence of a common enemy, democracy, economic interdependence, general war aversion, etc. The looming presence of the leviathan is certainly among these plausible explanations, but only inside the US sphere of influence. Bipolarity was bad for the nonaligned world, where Soviet and Western intervention routinely exacerbated local conflicts. Unipolarity has generally been much better, but whether or not this was due to US action is again unclear. Overall US interest in the affairs of the Global South has dropped markedly since the end of the Cold War, as has the level of violence in almost all regions. There is less US intervention in the political and military affairs of Latin America compared to any time in the twentieth century, for instance, and also less conflict. Warfare in Africa is at an all-time low, as is relative US interest outside of counterterrorism and security assistance.66 Regional peace and stability exist where there is US active intervention, as well as where there is not. No direct relationship seems to exist across regions. If intervention can be considered a function of direct and indirect activity, of both political and military action, a regional picture might look like what is outlined in Table 1. These assessments of conflict are by necessity relative, because there has not been a “high” level of conflict in any region outside the Middle East during the period of the New Peace. Putting aside for the moment that important caveat, some points become clear. The great powers of the world are clustered in the upper right quadrant, where US intervention has been high, but conflict levels low. US intervention is imperfectly correlated with stability, however. Indeed, it is conceivable that the relatively high level of US interest and activity has made the security situation in the Persian Gulf and broader Middle East worse. In recent years, substantial hard power investments (Somalia, Afghanistan, Iraq), moderate intervention (Libya), and reliance on diplomacy (Syria) have been equally ineffective in stabilizing states torn by conflict. While it is possible that the region is essentially unpacifiable and no amount of police work would bring peace to its people, it remains hard to make the case that the US presence has improved matters. In this “strong point,” at least, US hegemony has failed to bring peace. In much of the rest of the world, the United States has not been especially eager to enforce any particular rules. Even rather incontrovertible evidence of genocide has not been enough to inspire action. Washington’s intervention choices have at best been erratic; Libya and Kosovo brought about action, but much more blood flowed uninterrupted in Rwanda, Darfur, Congo, Sri Lanka, and Syria. The US record of peacemaking is not exactly a long uninterrupted string of successes. During the turn-of-the-century conventional war between Ethiopia and Eritrea, a highlevel US delegation containing former and future National Security Advisors (Anthony Lake and Susan Rice) made a half-dozen trips to the region, but was unable to prevent either the outbreak or recurrence of the conflict. Lake and his team shuttled back and forth between the capitals with some frequency, and President Clinton made repeated phone calls to the leaders of the respective countries, offering to hold peace talks in the United States, all to no avail.67 The war ended in late 2000 when Ethiopia essentially won, and it controls the disputed territory to this day. The Horn of Africa is hardly the only region where states are free to fight one another today without fear of serious US involvement. Since they are choosing not to do so with increasing frequency, something else is probably affecting their calculations. Stability exists even in those places where the potential for intervention by the sheriff is minimal. Hegemonic stability can only take credit for influencing those decisions that would have ended in war without the presence, whether physical or psychological, of the United States. It seems hard to make the case that the relative peace that has descended on so many regions is primarily due to the kind of heavy hand of the neoconservative leviathan, or its lighter, more liberal cousin. Something else appears to be at work.

#### No ‘space war.’ Insurmountable barriers and everyone has an interest in keeping space peaceful.

Bohumil Doboš 19, Scholar at the Institute of Political Studies, Faculty of Social Sciences, Charles University in Prague, Czech Republic, and Coordinator of the Geopolitical Studies Research Centre, Geopolitics of the Outer Space, Chapter 3: Outer Space as a Military-Diplomatic Field, p. 48-49

Despite the theorized potential for the achievement of the terrestrial dominance throughout the utilization of the ultimate high ground and the ease of destruction of space-based assets by the potential space weaponry, the utilization of space weapons is with current technology and no effective means to protect them far from fulfilling this potential (Steinberg 2012, p. 255). In current global international political and technological setting, the utility of space weapons isvery limited, even if we accept that the ultimate high ground presents the potential to get a decisive tangible military advantage (which is unclear). This stands among the reasons for the lack of their utilization so far. Last but not the least, it must be pointed out that the states also develop passive defense systems designed to protect the satellites on orbit or critical capabilities they provide. These further decrease the utility of space weapons. These systems include larger maneuvering capacities, launching of decoys, preparation of spare satellites that are ready for launch in case of ASAT attack on its twin on orbit, or attempts to decrease the visibility of satellites using paint or materials less visible from radars (Moltz 2014, p. 31).

Finally, we must look at the main obstacles of connection of the outer space and warfare. The first set of barriers is comprised of physical obstructions. As has been presented in the previous chapter, the outer space is very challenging domain to operate in. Environmental factors still present the largest threat to any space military capabilities if compared to any man-made threats (Rendleman 2013, p. 79). A following issue that hinders military operations in the outer space is the predictability of orbital movement. If the reconnaissance satellite's orbit is known, the terrestrial actor might attempt to hide some critical capabilities-an option that is countered by new surveillance techniques (spectrometers, etc.) (Norris 2010, p. 196)-but the hide-and-seek game is on. This same principle is, however, in place for any other space asset-any nation with basic tracking capabilities may quickly detect whether the military asset or weapon is located above its territory or on the other side of the planet and thus mitigate the possible strategic impact of space weapons not aiming at mass destruction. Another possibility is to attempt to destroy the weapon in orbit. Given the level of development for the ASAT technology, it seems that they will prevail over any possible weapon system for the time to come. Next issue, directly connected to the first one, is the utilization of weak physical protection of space objects that need to be as light as possible to reach the orbit and to be able to withstand harsh conditions of the domain. This means that their protection against ASAT weapons is very limited, and, whereas some avoidance techniques are being discussed, they are of limited use in case of ASAT attack. We can thus add to the issue of predictability also the issue of easy destructibility of space weapons and other military hardware (Dolman 2005, p. 40; Anantatmula 2013, p. 137; Steinberg 2012, p. 255). Even if the high ground was effectively achieved and other nations could not attack the space assets directly, there is still a need for communication with those assets from Earth. There are also ground facilities that support and control such weapons located on the surface. Electromagnetic communication with satellites might be jammed or hacked and the ground facilities infiltrated or destroyed thus rendering the possible space weapons useless (Klein 2006, p. 105; Rendleman 2013, p. 81). This issue might be overcome by the establishment of a base controlling these assets outside the Earth-on Moon or lunar orbit, at lunar L-points, etc.-but this perspective remains, for now, unrealistic. Furthermore, no contemporary actor will risk full space weaponization in the face of possible competition and the possibility of rendering the outer space useless. No actor is dominant enough to prevent others to challenge any possible attempts to dominate the domain by military means. To quote 2016 Stratfor analysis, "(a) war in space would be devastating to all, and preventing it, rather than finding ways to fight it, will likely remain the goal" (Larnrani 20 16). This stands true unless some space actor finds a utility in disrupting the arena for others.

#### No space war, and no impact if it does happen

Handberg 17 Roger Handberg 17, Professor in the School of Politics, Security, and International Affairs at the University of Central Florida, 2017, “Is space war imminent? Exploring the possibility,” Comparative Strategy, Vol. 36, No. 5, p. 413-425

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

#### China’s Asteroid Mining efforts are light-years ahead of everyone else – now is key for Asteroid Mining. Successful Mining solves Warming through Green Transition.

Cohen 21 Ariel Cohen 10-26-2021 "China’s Space Mining Industry Is Prepping For Launch – But What About The US?" <https://www.forbes.com/sites/arielcohen/2021/10/26/chinas-space-mining-industry-is-prepping-for-launch--but-what-about-the-us/?sh=6b8bea862ae0> (I am a Senior Fellow at the Atlantic Council and the Founding Principal of International Market Analysis, a Washington, D.C.-based global risk advisory boutique.)//Elmer

Exploration of space-based natural resources are on the Chinese policy makers’ mind. The question is, what Joe Biden thinks? In April of this year, China’s Shenzen Origin Space Technology Co. Ltd. launched the NEO-1, the first commercial spacecraft dedicated to the mining of space resources – from asteroids to the lunar surface. Falling costs of space launches and spacecraft technology alongside existing infrastructure provides a unique opportunity to explore extraterrestrial resource extraction. Current technologies are equipped to analyze and categorize asteroids within our solar system with a limited degree of certainty. One of the accompanying payloads to the NEO-1 was the Yuanwang-1, or “little hubble” satellite, which searches the stars for possible asteroid mining targets. The NEO-1 launch marks another milestone in private satellite development, adding a new player to space based companies which include Japan’s Astroscale. Private asteroid identification via the Sentinel Space Telescope was supported by NASA until 2015. As private investment in space grows, the end goal is to be capable of harvesting resources to bring to Earth. “Through the development and launch of the spacecraft, Origin Space is able to carry out low-Earth orbit space junk cleanup and prototype technology verification for space resource acquisition, and at the same time demonstrate future asteroid defense related technologies.” In the end, it will come down to progressively lowering the cost of launched unit of weight and booster rocket reliability – before fundamentally new engines may drive the launch costs even further down. The April launch demonstrates that China is already succeeding while the West is spinning its wheels. The much touted Planetary Resources and Deep Space Industries (DSI) DSI -1% were supposed to be the vanguard of extra-terrestrial resource acquisition with major backers including Google’s GOOG -1.4% Larry Page. But both have since been acquired, the former by block chain company ConsenSys and the latter by Bradford Space, neither of which are prioritizing asteroid mining. This is too bad, given that that supply chain crunches here on Earth – coupled with the global green energy transition – are spiking demand for strategic minerals that are increasingly hard to come by on our environmentally stressed planet. And here China currently holds a monopoly on rare earth element (REE) extraction and processing to the tune of 90%. REE’s 17 minerals essential for modern computing and manufacturing technologies for everything from solar panels to semi-conductors. Resource-hungry China also has major involvement in global critical mineral supply chains, which include cobalt, tungsten, and lithium. As I’ve written before, the Chinese hold of upstream and downstream markets is staggering. Possessing 30% of the global mined ore, 80% of the global processing facilities, and an ever increasing list of high dollar investments around the world, China boasts over $36 billion invested in mining projects in Africa alone. Beijing’s space program clearly indicates that the Chinese would also like to tighten their grip on space-based resources as well. According to research, it is estimated that a small asteroid roughly 200 meters in length that is rich in platinum could be worth up to $300 million. Merrill Lynch predicts the space industry — including extraterrestrial mining industry – to value $2.7 trillion in the next three decades. REEs are fairly common in the solar system, but to what degree remains unknown. The most sought after are M-type asteroids which are mostly metal and hundreds of cubic meters. While these are not the most common, the 27,115 Near Earth asteroids are bound to contain a few. This – and military applications – are no doubt a driving factor of China’s ever increasing space ambitions.

#### Warming causes Extinction

Kareiva 18, Peter, and Valerie Carranza. "Existential risk due to ecosystem collapse: Nature strikes back." Futures 102 (2018): 39-50. (Ph.D. in ecology and applied mathematics from Cornell University, director of the Institute of the Environment and Sustainability at UCLA, Pritzker Distinguished Professor in Environment & Sustainability at UCLA)//Re-cut by Elmer

In summary, six of the nine proposed planetary boundaries (phosphorous, nitrogen, biodiversity, land use, atmospheric aerosol loading, and chemical pollution) are unlikely to be associated with existential risks. They all correspond to a degraded environment, but in our assessment do not represent existential risks. However, the three remaining boundaries (**climate change**, global **freshwater** cycle, **and** ocean **acidification**) do **pose existential risks**. This is **because of** intrinsic **positive feedback loops**, substantial lag times between system change and experiencing the consequences of that change, and the fact these different boundaries interact with one another in ways that yield surprises. In addition, climate, freshwater, and ocean acidification are all **directly connected to** the provision of **food and water**, and **shortages** of food and water can **create conflict** and social unrest. Climate change has a long history of disrupting civilizations and sometimes precipitating the collapse of cultures or mass emigrations (McMichael, 2017). For example, the 12th century drought in the North American Southwest is held responsible for the collapse of the Anasazi pueblo culture. More recently, the infamous potato famine of 1846–1849 and the large migration of Irish to the U.S. can be traced to a combination of factors, one of which was climate. Specifically, 1846 was an unusually warm and moist year in Ireland, providing the climatic conditions favorable to the fungus that caused the potato blight. As is so often the case, poor government had a role as well—as the British government forbade the import of grains from outside Britain (imports that could have helped to redress the ravaged potato yields). Climate change intersects with freshwater resources because it is expected to exacerbate drought and water scarcity, as well as flooding. Climate change can even impair water quality because it is associated with heavy rains that overwhelm sewage treatment facilities, or because it results in higher concentrations of pollutants in groundwater as a result of enhanced evaporation and reduced groundwater recharge. **Ample clean water** is not a luxury—it **is essential for human survival**. Consequently, cities, regions and nations that lack clean freshwater are vulnerable to social disruption and disease. Finally, ocean acidification is linked to climate change because it is driven by CO2 emissions just as global warming is. With close to 20% of the world’s protein coming from oceans (FAO, 2016), the potential for severe impacts due to acidification is obvious. Less obvious, but perhaps more insidious, is the interaction between climate change and the loss of oyster and coral reefs due to acidification. Acidification is known to interfere with oyster reef building and coral reefs. Climate change also increases storm frequency and severity. Coral reefs and oyster reefs provide protection from storm surge because they reduce wave energy (Spalding et al., 2014). If these reefs are lost due to acidification at the same time as storms become more severe and sea level rises, coastal communities will be exposed to unprecedented storm surge—and may be ravaged by recurrent storms. A key feature of the risk associated with climate change is that mean annual temperature and mean annual rainfall are not the variables of interest. Rather it is extreme episodic events that place nations and entire regions of the world at risk. These extreme events are by definition “rare” (once every hundred years), and changes in their likelihood are challenging to detect because of their rarity, but are exactly the manifestations of climate change that we must get better at anticipating (Diffenbaugh et al., 2017). Society will have a hard time responding to shorter intervals between rare extreme events because in the lifespan of an individual human, a person might experience as few as two or three extreme events. How likely is it that you would notice a change in the interval between events that are separated by decades, especially given that the interval is not regular but varies stochastically? A concrete example of this dilemma can be found in the past and expected future changes in storm-related flooding of New York City. The highly disruptive flooding of New York City associated with Hurricane Sandy represented a flood height that occurred once every 500 years in the 18th century, and that occurs now once every 25 years, but is expected to occur once every 5 years by 2050 (Garner et al., 2017). This change in frequency of extreme floods has profound implications for the measures New York City should take to protect its infrastructure and its population, yet because of the stochastic nature of such events, this shift in flood frequency is an elevated risk that will go unnoticed by most people. 4. The combination of positive feedback loops and societal inertia is fertile ground for global environmental catastrophes **Humans** are remarkably ingenious, and **have adapted** to crises **throughout** their **history**. Our doom has been repeatedly predicted, only to be averted by innovation (Ridley, 2011). **However**, the many **stories** **of** human ingenuity **successfully** **addressing** **existential risks** such as global famine or extreme air pollution **represent** environmental c**hallenges that are** largely **linear**, have immediate consequences, **and operate without positive feedbacks**. For example, the fact that food is in short supply does not increase the rate at which humans consume food—thereby increasing the shortage. Similarly, massive air pollution episodes such as the London fog of 1952 that killed 12,000 people did not make future air pollution events more likely. In fact it was just the opposite—the London fog sent such a clear message that Britain quickly enacted pollution control measures (Stradling, 2016). Food shortages, air pollution, water pollution, etc. send immediate signals to society of harm, which then trigger a negative feedback of society seeking to reduce the harm. In contrast, today’s great environmental crisis of climate change may cause some harm but there are generally long time delays between rising CO2 concentrations and damage to humans. The consequence of these delays are an absence of urgency; thus although 70% of Americans believe global warming is happening, only 40% think it will harm them (http://climatecommunication.yale.edu/visualizations-data/ycom-us-2016/). Secondly, unlike past environmental challenges, **the Earth’s climate system is rife with positive feedback loops**. In particular, as CO2 increases and the climate warms, that **very warming can cause more CO2 release** which further increases global warming, and then more CO2, and so on. Table 2 summarizes the best documented positive feedback loops for the Earth’s climate system. These feedbacks can be neatly categorized into carbon cycle, biogeochemical, biogeophysical, cloud, ice-albedo, and water vapor feedbacks. As important as it is to understand these feedbacks individually, it is even more essential to study the interactive nature of these feedbacks. Modeling studies show that when interactions among feedback loops are included, uncertainty increases dramatically and there is a heightened potential for perturbations to be magnified (e.g., Cox, Betts, Jones, Spall, & Totterdell, 2000; Hajima, Tachiiri, Ito, & Kawamiya, 2014; Knutti & Rugenstein, 2015; Rosenfeld, Sherwood, Wood, & Donner, 2014). This produces a wide range of future scenarios. Positive feedbacks in the carbon cycle involves the enhancement of future carbon contributions to the atmosphere due to some initial increase in atmospheric CO2. This happens because as CO2 accumulates, it reduces the efficiency in which oceans and terrestrial ecosystems sequester carbon, which in return feeds back to exacerbate climate change (Friedlingstein et al., 2001). Warming can also increase the rate at which organic matter decays and carbon is released into the atmosphere, thereby causing more warming (Melillo et al., 2017). Increases in food shortages and lack of water is also of major concern when biogeophysical feedback mechanisms perpetuate drought conditions. The underlying mechanism here is that losses in vegetation increases the surface albedo, which suppresses rainfall, and thus enhances future vegetation loss and more suppression of rainfall—thereby initiating or prolonging a drought (Chamey, Stone, & Quirk, 1975). To top it off, overgrazing depletes the soil, leading to augmented vegetation loss (Anderies, Janssen, & Walker, 2002). Climate change often also increases the risk of forest fires, as a result of higher temperatures and persistent drought conditions. The expectation is that **forest fires will become more frequent** and severe with climate warming and drought (Scholze, Knorr, Arnell, & Prentice, 2006), a trend for which we have already seen evidence (Allen et al., 2010). Tragically, the increased severity and risk of Southern California wildfires recently predicted by climate scientists (Jin et al., 2015), was realized in December 2017, with the largest fire in the history of California (the “Thomas fire” that burned 282,000 acres, https://www.vox.com/2017/12/27/16822180/thomas-fire-california-largest-wildfire). This **catastrophic fire** embodies the sorts of positive feedbacks and interacting factors that **could catch humanity off-guard and produce a** true **apocalyptic event.** Record-breaking rains produced an extraordinary flush of new vegetation, that then dried out as record heat waves and dry conditions took hold, coupled with stronger than normal winds, and ignition. Of course the record-fire released CO2 into the atmosphere, thereby contributing to future warming. Out of all types of feedbacks, water vapor and the ice-albedo feedbacks are the most clearly understood mechanisms. Losses in reflective snow and ice cover drive up surface temperatures, leading to even more melting of snow and ice cover—this is known as the ice-albedo feedback (Curry, Schramm, & Ebert, 1995). As snow and ice continue to melt at a more rapid pace, millions of people may be displaced by flooding risks as a consequence of sea level rise near coastal communities (Biermann & Boas, 2010; Myers, 2002; Nicholls et al., 2011). The water vapor feedback operates when warmer atmospheric conditions strengthen the saturation vapor pressure, which creates a warming effect given water vapor’s strong greenhouse gas properties (Manabe & Wetherald, 1967). Global warming tends to increase cloud formation because warmer temperatures lead to more evaporation of water into the atmosphere, and warmer temperature also allows the atmosphere to hold more water. The key question is whether this increase in clouds associated with global warming will result in a positive feedback loop (more warming) or a negative feedback loop (less warming). For decades, scientists have sought to answer this question and understand the net role clouds play in future climate projections (Schneider et al., 2017). Clouds are complex because they both have a cooling (reflecting incoming solar radiation) and warming (absorbing incoming solar radiation) effect (Lashof, DeAngelo, Saleska, & Harte, 1997). The type of cloud, altitude, and optical properties combine to determine how these countervailing effects balance out. Although still under debate, it appears that in most circumstances the cloud feedback is likely positive (Boucher et al., 2013). For example, models and observations show that increasing greenhouse gas concentrations reduces the low-level cloud fraction in the Northeast Pacific at decadal time scales. This then has a positive feedback effect and enhances climate warming since less solar radiation is reflected by the atmosphere (Clement, Burgman, & Norris, 2009). The key lesson from the long list of potentially positive feedbacks and their interactions is that **runaway climate change,** and runaway perturbations have to be taken as a serious possibility. Table 2 is just a snapshot of the type of feedbacks that have been identified (see Supplementary material for a more thorough explanation of positive feedback loops). However, this list is not exhaustive and the possibility of undiscovered positive feedbacks **portends** even greater **existential risks**. The many environmental crises humankind has previously averted (famine, ozone depletion, London fog, water pollution, etc.) were averted because of political will based on solid scientific understanding. We cannot count on complete scientific understanding when it comes to positive feedback loops and climate change.

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