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#### Innovation high now but aff trades off

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Every once in a while, a confluence of discoveries, events and initiatives results in a breakthrough so significant that it propels the entire world to a higher level, redefining what is possible in so many different fields. This breakthrough is taking centerstage now, as the new era of space exploration — catalyzed by increasing launch access — dawns upon us. The surge of innovation that comes with this will create new opportunities and inspire the next generation of doers. When this happens, boundaries between scientific and social impact are blurred. Innovation leading to scientific discovery can benefit society in the same way that social innovation can diversify and support scientific innovators, who can contribute to global progress. To ride this wave of progress, we must all participate and innovate in the new era of space exploration. The intersection of space exploration, innovation and impact isn’t a new phenomenon. In the past, technology developments and spin-offs from space research have consistently found their way into communities worldwide sometimes with lifesaving benefits. The International Space Station supports experiments that have led to discoveries and inventions in communication, water purification, and remote guidance for health procedures and robotic surgeries. Satellite-enabled Earth observation capabilities that monitor natural disasters, climate and crops often support early warnings for threats and mitigation strategies. Space exploration has always been relevant to everyone no matter the discipline or interest. Commercialization of space has been key in many ways to the current boost in “firsts” over the last few years. It has spurred innovation in launch vehicles and related technologies that led to firsts in vertical-takeoff-vertical landing rocket technology, reusability of rocket boosters and privately developed crewed missions to orbit. Concurrently, NASA has continued to captivate our imagination with the first flight of a helicopter in another world, a mission to return an asteroid sample to Earth and sending a probe to make the closest ever approach to the sun. While we celebrate the scientific progress, there is a vastly important question that we all need to focus on: How can we drive the surge in innovation offered by increased access to space, to benefit humankind? Access to low-Earth orbit, and eventually human exploration of space, is a portal to achieve many impactful outcomes. The numbers and completion rate of microgravity experiments conducted by scientists will be greatly increased as a range of offerings in suborbital flights provide more opportunities to advance critical research in health, agriculture, energy, and more. Lunar, planetary, and even asteroid exploration may lead to discoveries of new materials — busting the limitations now imposed on capabilities for energy, transportation, and infrastructure or creating new sensors and devices that enhance safety on Earth. Space tourism —one can hope — has the power to potentially create an awareness of our oneness that may lead to social change.

#### Commercial space innovation stops extinction

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We find ourselves still at the dawn of a new space century, mindful of the victories and setbacks of our past, eager to pass the torch to the next generation of space visionaries, scientists, engineers, and enthusiasts. We look to the future not just to see how much bigger, faster, or higher we can reach, but also how the United States, and specifically the U.S. space community, can again inspire the nations of the world to align with us, as it did in the 20th century. The SmallSat Alliance is an alliance of companies developing, producing, and operating in all segments of the ‘next generation’ space economy; championing renewed U.S. leadership in the burgeoning commercial space economy, and advocating for the transformation of government-led space capabilities. We are experienced space professionals who have chosen to join with others leveraging our decades of hard-won experience, to develop smarter ways to explore space in the 21st century. A wonderful outgrowth of the legacy space program is the commercial, entrepreneurial, and job-creating commercial space business that it bequeathed. These next-generation enterprises range from multi-million-dollar startups providing rideshare opportunities or components for small satellites to multi-billion-dollar space data-analytic platforms reinventing urban car service and agricultural production. The early returns of this economic revolution are already on our doorstep: space data capabilities are exponentially growing elements of the 21st century world economy. Beginning with the dreams and funding by successful tech entrepreneurs, enormous venture investments are already delivering wondrous benefits to the world. Commercial Space – Profit and Non-Profit There are really two major categories in the commercial sector, the profit driven and the non-profit. The classic for-profit companies include not only those designing, building, launching, and operating satellites but also the tech sector that is turning that raw space data into gold through machine-learning analytics. Since for-profit companies are no longer dependent upon the revenues generated by the Cold War space race culture of a bygone era, this new generation of space companies is able to more efficiently capitalize on Moore’s Law, the nonstop exponential growth in chip density, and the associated networking technology co-evolving with it. This new generation is building profitable businesses helping to clean up our oceans of garbage and debris with satellite surveillance, reconnoitering to assist in enforcing laws that protect our oceans from illegal, unregulated, unlicensed fishing, something that is rapidly depleting the world’s most valuable and essential lifeforms. It’s leading in the innovative use of low-cost satellite constellations to produce ubiquitous remote-sensing data, enabling small business owners to be more profitable and less wasteful. For example, precise timing signals from space are already optimizing transportation of people, goods, and services, with even further gains anticipated with the introduction of artificial intelligence to assist drivers, perhaps even someday replacing them entirely. The non-profit sector is the other side of commercial space, concerned more for the general welfare of society, but every bit as integral to this new space enterprise. Much like every century before it in human history, ours is not without its unique challenges, some of which have been a consequence of the last, and all of which the space data domain can be leveraged to help solve. Examples are endless, but one challenge that this new space community is uniquely well-adapted for is to further inform worldwide resource allocation for the 21st century and beyond. These two primary resources are sustainable water and the materials needed for adequate housing for an ever-increasing human population. As cities and urbanization continue to expand, governmental planning challenges such as transportation design optimization for goods and services are only the beginning. Additionally, through using inexpensive remote sensing technologies, some members are designing space data analytics to mitigate human suffering from plagues, contain outbreaks, and combating illegal poaching. Some are connecting with other non-profits to curtail human trafficking for the sex trade or forced labor for migrant debt repayment. Still others are helping non-governmental organizations in their work to expose the use of children as soldiers. Addressing these challenges has little to do with resuscitating dreams conceived by long deceased science-fiction writers and much more to do with turning “swords back into plowshares” to solve real threats to humanity. Other non-profit initiatives include pursuing an even more foundational understanding of who we are and how to be the best custodians of our environment. Much as exploring and monitoring the world’s oceans has advanced civilization through a better understanding of human life and the planet, so too does exploring and monitoring from space. Low Earth orbit (LEO) provides a unique vantage point to look back on the planet and understand what is happening, anticipate what might happen and prepare for the future. In addition to better understanding Earth, responsible and rapid exploitation of the low Earth orbit domain will enhance the understanding of the solar system and the rest of the universe. Small satellites already offer low-cost platforms to study and explore what lies beyond the Earth. Other members are pioneering the use of zero-carbon, hydrogen-based reusable propulsion systems to ensure we don’t worsen our atmosphere using kerosene-fueled rockets for the coming tsunami of satellite launches. Finally, a mission ensuring the general welfare and planet survival for the next thousand years is finally confronting the existential threat that asteroids and comets pose to humanity. These extra-terrestrial, deep-space threats are passing dangerously close to our planet, and today we have no solar map of them and no defense.

#### Privatized innovation key to increasing data collection

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Data Collection, Processing and SSA Products. Breaking up of the system has enabled each segment to evolve somewhat independently. On the data collection front, there is already an explosion of new sensors through the development of new sites. Countries and companies are also looking for “signals of opportunity” to repurpose existing sensors such as those used for astronomy and atmospheric science research and, for a small investment, utilize them for SSA. Newly added sensors include all types—optical, radar, and radiofrequency (RF). Expecting a growing market for SSA, many private companies have plans to add more radar, RF, and space-based sensors. The fact that the cost of these sensors and their operation is falling, primarily for optical but also potentially for radar, is beneficial for the private sector, which has to raise funds in private markets. However, the trade-off between cost and performance of radar may continue. When properly located, more sensors, even if they are not necessarily exquisite, allow for more persistence— ability to see assets more of the time. Over time, the expansion of sensors would allow data to become more of a commodity (the need for exquisite data for certain applications will always remain) with the value remaining in software systems.

On the processing front, there is growth in the number of systems for creating catalogs and producing more actionable SSA products. Some of the software is open source with the potential to enable faster rates of innovation, although most appears to be proprietary and owned by governments and individual private companies. While most of the development is in the United States, there are pockets of activity in France and Spain, among other countries.

Innovation is not limited just to the counts of sensors or software: there are qualitative changes under way that are likely to improve SSA capabilities. For example, on the sensor front, there are efforts to examine whether optical sensors, which are cheaper, easier to install, and more abundant, can be used to track objects in low Earth orbit (LEO), where most of the growth of space traffic is expected. On the processing front, machine learning and other techniques in the mainstream IT community are increasingly being applied to process data expected to come from the growing number and diverse phenomenologies of sensors (e.g., combining data from optical and radar sensors to create new insights not feasible with just one type of sensor). There is also effort to use large amounts of data to compensate for physics-based models in algorithms (e.g., effect of solar weather), and predict orbits at similar levels of accuracy as with more sophisticated models. As a result, both countries and companies are increasing capabilities.

In the coming years, this innovation—both on the quantity and quality front—would allow for increasingly more (e.g., including covariance information) and better (e.g., smaller error ellipses) SSA information. Given growing capabilities in the private sector, it is also likely that the cost of SSA products could substantially decrease. This innovation could allow other countries to follow different pathways (for example, by leveraging the private sector or developing international partnerships), and leap-frog closer to the expertise level of the United States without the same investment of time and funding. This in turn would allow them to become more equal partners as well as acquire capabilities that are closer to being on par with the United States, with the end result that while the U.S. Government may have the best SSA information in the world, it will not be the only source of SSA information in the world.

#### Satellite advancement and rules of the road stops warming wars from escalating

David Harary 19, Future Tense is a partnership of Slate, New America, and Arizona State University that examines emerging technologies, public policy, and society., 8-13-2019, "If Another Country Blows Up Our Satellites, We’re in Deep Trouble," Slate Magazine, https://slate.com/technology/2019/08/space-militarization-earth-observation-satellites.html

Every corner of our modern lives depends on environmental data from Earth observation satellites. They provide more than 90 percent of the data used by weather prediction models. The availability of much of our most basic resources, especially agriculture and water, now largely relies on meteorological and environmental forecasts made using this information. Today, remote sensing satellites are able to offer scientists data that range from sea surface height to soil moisture content. With this information, farmers can better plan for precipitation and temperature fluctuations, thereby increasing their yield. Businesses and regional planners can mitigate risks of flood zones. Ecologists can monitor the migration of invasive species. Knowing when and how long drought, flooding, extreme weather, or other natural disasters will occur is especially crucial. Timely access to global environmental data and information from satellites help federal, state, and local governments; businesses; nonprofits; and other organizations ensure the security of our property, resources, environment, economy, and lives. The array of instruments onboard the National Oceanic and Atmospheric Administration’s low-Earth orbiting and geostationary orbiting satellites, for example, provide meteorologists with measures of temperature, precipitation, wind speed, and other information they need to predict the strength of hurricanes. Without the dependable downlink and delivery of these data and forecasts, our national security would most certainly be severely hampered. Now, as we enter a new era of space militarization, these environmental satellites are also at risk. They’re clear targets for militaries across the globe. The ramp up for a new satellite arms race started in 2007 when China launched a missile that intentionally obliterated one of its own weather satellites. Since then, Russia and India have also developed, tested, and deployed technologies intended to hack, intercept, sabotage, shoot down, or even physically maneuver out of orbit satellites that provide a wide range of data. The United States and France have already claimed that Russia has spied on their satellites from space. Earth observation is becoming increasingly important as global security threats are more intertwined with deteriorating environmental conditions. So far, there have been no reports of anti-satellite weapons being used against a foreign country. But it seems like a matter of time. As a response to these capabilities, French President Emmanuel Macron recently announced the creation of a French space force that would be able to defend its satellites. It’s not the only one. Today, six countries operate specific military branches for space operations, including Russia’s Aerospace Forces and China’s People’s Liberation Army Strategic Support Force. President Donald Trump’s plan to create a so-called Space Force, which now seems increasingly likely to happen, comes at a period of heightened tension, capability, and risk beyond Earth’s atmosphere. Countries argue they need new military investments to defend assets in space that provide vital economic, environmental, geographic, telecommunications, or intelligence information. The development of these defenses foreshadows the space wars of tomorrow. Imaging satellites, in particular, offer huge advantages to their operators. All-seeing eyes from space are certainly an asset to any military. This makes Earth observation and environmental satellites high-value targets in the context of conflict and war. China’s successful shoot-down of its own weather satellite and attempted hacking of the U.S. weather satellite network in 2014 underscores the strategic importance these satellites have. Worse yet, the 1967 U.N. Outer Space Treaty, which governs the use of space through international law, is out of date. The treaty does not cover modern forms of space weaponization, including ones that threaten satellite infrastructure. Without comprehensive and modern governance and regulations in space, countries are largely free to do as they please without fear of legal repercussions. This is especially worrying when climate-driven insecurity is helping drive conflict and war across the globe. Consistent and timely observation of precipitation, temperature, and vegetation conditions, in particularly volatile and fragile states, can help to proactively manage and mitigate the potential rise of social and political tensions over scarce resources. For example, recent drought has already contributed to significant social and political tension in Central America. The drought has caused more than 2.8 million people in the region to go hungry. Such increased water and food insecurity has helped spark internal territorial conflicts, which have triggered greater migration toward Mexico and the United States. These challenges are only worsened by weak, corrupt, and ineffective governance in the region. The development of such unrest is particularly concerning, as these events can quickly turn deadly and bring about armed conflict. Satellites provide needed data at a scale, resolution, and timeline other data-capturing platforms simply cannot rival. Limiting or knocking out the capabilities these tools have means far worse forecasting abilities. Without this data, countries will be left with the significantly increased risk of improperly handling and managing resource shortages, natural disasters, and possible conflict and migration resulting from insecurity. Fortunately, there are a number of steps Earth observation platforms can take to adequately defend themselves against attacks in space. The most likely and gravest threat to satellite systems is through cyber hacking. Countries that bolster cyber defenses by embedding security in the design, architecture, and production of these systems are therefore best prepared for these risks. However, kinetic, physical and even laser defenses may also be needed as countries develop missiles, robotic arms, and other techniques specifically designed to subvert environmental intelligence gathering. As such, Earth observation satellites that append defensive maneuvering or interception capabilities would be best prepared. Another way to reduce potential physical security risk is to diversify and multiply the quantity of satellite platforms. With the new space race comes significant technological leaps. Most important is perhaps the development of CubesSats, or miniaturized satellites that often pack powerful technology into small cubes. Sensors are getting smaller and propulsion more compact, and with reusable rockets, the overall cost of launching into space is plummeting thanks to startups like Spire, Planet, and SpaceX. The result: exponentially more Earth observation platforms in space. Offensive targeting of many small satellites is much more challenging than targeting one large satellite. Lastly, we need strong multinational governance and greater diplomatic leadership to ensure that, as with the last space race, the international community sets out clear rules and fair practices for the emerging forms of space technology being utilized. Environmental and meteorological forecasting requires a global team effort. International laws and treaties that protect Earth observation assets in space can help provide the assurances they need going forward. In light of Chinese and Russian testing of maneuverable satellites in orbit, the U.S. and Japan have recently sought to develop joint space situational awareness capabilities. Such information-sharing pacts are significant first steps toward building multilateral networks that can defend assets in space. Earth observation is becoming increasingly important as global security threats are more intertwined with deteriorating environmental conditions. Opportunities for mass displacement, civil war, and even greater nuclear proliferation increase as a changing climate fundamentally shifts the geopolitical dynamics that govern countries and their resources. Environmental satellites provide the intelligence and acute warnings needed to mitigate these risks before they occur. Securing these signals in the sky is now more imperative than ever.

### Off 2

#### Current business sentiment promises a slow and steady recovery.

Dr. Mark Zandi 11/15, PhD from UPenn, economist, and director of economic research at Moody’s Analytics, 11/15/21, “Moody's Analytics Survey of Business Confidence,” <https://www.economy.com/economicview/indicator/usa_dsbc/5C438EAA-8AA1-484E-8931-62208FCACE22>, cc

Abstracting from the weekly ups and downs of responses to the global business survey, business sentiment remains stuck consistent with a slowly recovering global economy. Most encouraging, more than one-third of respondents to the survey say present business conditions are improving and more than half say their sales are strengthening. Hiring and investment intentions aren’t as strong, but they are much improved since the dark days of the pandemic. Demand for office space remains depressed, inventory accumulation is weak, and though financial conditions are good, they aren’t as good as they were prior to the pandemic.

#### **Consistent space regulations are key to business confidence**

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Like most areas of economic activity, space resource utilisation business plans are based upon the ability to access a resource, produce a product, service, or goods based from the resource, and produce revenue from that product based on established market activities. An economic system requires a level of regulation and oversight to ensure it functions. Regulation and governmental oversight is part of an overall market framework that provides stability and confidence in validity for commercial entities and those that invest in them. Just as the commercial companies are in the initial stages of developing and validating hardware, governments have begun to establish regulatory and policy frameworks.

#### Business confidence is tied to economic growth

Sarah Chaney Cambon 21, Reporter on The Wall Street Journal's Economics Team, BA in Business Journalism from the University of North Carolina-Chapel Hill, “Capital-Spending Surge Further Lifts Economic Recovery”, Wall Street Journal, 6/27/2021, https://www.wsj.com/articles/capital-spending-surge-further-lifts-economic-recovery-11624798800

Business investment is emerging as a powerful source of U.S. economic growth that will likely help sustain the recovery.

Companies are ramping up orders for computers, machinery and software as they grow more confident in the outlook.

Nonresidential fixed investment, a proxy for business spending, rose at a seasonally adjusted annual rate of 11.7% in the first quarter, led by growth in software and tech-equipment spending, according to the Commerce Department. Business investment also logged double-digit gains in the third and fourth quarters last year after falling during pandemic-related shutdowns. It is now higher than its pre-pandemic peak.

Orders for nondefense capital goods excluding aircraft, another measure for business investment, are near the highest levels for records tracing back to the 1990s, separate Commerce Department figures show.

“Business investment has really been an important engine powering the U.S. economic recovery,” said Robert Rosener, senior U.S. economist at Morgan Stanley. “In our outlook for the economy, it’s certainly one of the bright spots.”

Consumer spending, which accounts for about two-thirds of economic output, is driving the early stages of the recovery. Americans, flush with savings and government stimulus checks, are spending more on goods and services, which they shunned for much of the pandemic.

Robust capital investment will be key to ensuring that the recovery maintains strength after the spending boost from fiscal stimulus and business reopenings eventually fades, according to some economists.

Rising business investment helps fuel economic output. It also lifts worker productivity, or output per hour. That metric grew at a sluggish pace throughout the last economic expansion but is now showing signs of resurgence.

The recovery in business investment is shaping up to be much stronger than in the years following the 2007-09 recession. “The events especially in late ’08, early ’09 put a lot of businesses really close to the edge,” said Phil Suttle, founder of Suttle Economics. “I think a lot of them said, ‘We’ve just got to be really cautious for a long while.’”

Businesses appear to be less risk-averse now, he said.

After the financial crisis, businesses grew by adding workers, rather than investing in capital. Hiring was more attractive than capital spending because labor was abundant and relatively cheap. Now the supply of workers is tight. Companies are raising pay to lure employees. As a result, many firms have more incentive to grow by investing in capital.

Economists at Morgan Stanley predict that U.S. capital spending will rise to 116% of prerecession levels after three years. By comparison, investment took 10 years to reach those levels once the 2007-09 recession hit.

Company executives are increasingly confident in the economy’s trajectory. The Business Roundtable’s economic-outlook index—a composite of large companies’ plans for hiring and spending, as well as sales projections—increased by nine points in the second quarter to 116, just below 2018’s record high, according to a survey conducted between May 25 and June 9. In the second quarter, the share of companies planning to boost capital investment increased to 59% from 57% in the first.

“We’re seeing really strong reopening demand, and a lot of times capital investment follows that,” said Joe Song, senior U.S. economist at BofA Securities.

Mr. Song added that less uncertainty regarding trade tensions between the U.S. and China should further underpin business confidence and investment. “At the very least, businesses will understand the strategy that the Biden administration is trying to follow and will be able to plan around that,” he said.

#### 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.

### Off 3

#### CP Text: Major spacefaring Nations ought to modernize the Outer Space Treaty.

#### CP solves aff and larger celestial management issues—prefer it.

Rajeswari Pillai Rajagopalan 2021, 2-23-2021, "The Outer Space Treaty," Council on Foreign Relations, <https://www.cfr.org/report/outer-space-treaty> (Dr. Rajeswari (Raji) Pillai Rajagopalan is the Director of the Centre for Security, Strategy & Technology (CSST) at the Observer Research Foundation, New Delhi. ) //ingp

All major spacefaring nations should prioritize revitalizing the Conference on Disarmament (CD). The CD is the multilateral body in Geneva responsible for international arms control negotiations, including for outer space. But the CD has not participated in any significant negotiations for more than two decades largely due to member states’ disagreement on their annual program of work. If this stalemate continues to block new multilateral agreements, countries will be forced to rely on deterrence to protect their assets in outer space. This approach would be inherently destabilizing and would have a cascading effect: if one country relies on deterrence, others will be forced to follow, making further negotiations difficult. Deterrence has not yet become the default policy for any state in outer space. The world can still avoid this path. Before this happens, multilateral negotiations need to resume in the CD. Certain countries have a tendency to suggest other venues, but, to a large number of countries, the CD is the only multilateral institution that can negotiate a space security–related agreement. Many countries attach importance to the CD’s consensus rule for decision-making, which allows smaller, weaker members to veto decisions. On the flip side, this rule also holds agreements susceptible to the whims of any of the member states. Developing consensus among the major powers has remained the biggest stumbling block to creating an effective outer space regime, which means that the CD’s functioning will continue to suffer unless countries, particularly great powers, can sufficiently resolve their differences. Unless states find ways to revitalize the CD’s functioning and start agreeing on a program of work at the minimum, addressing the growing problems of governance in outer space will be difficult. Other venues such as the UN First Committee and the UN Disarmament Commission are too large and unwieldy to negotiate, while venues such as the UN Committee on the Peaceful Uses of Outer Space do not have the mandate to discuss military space issues. All OST signatories should review and modernize the treaty. Although the OST has served as a useful instrument in ensuring safe and secure access to outer space, the development of counter-space capabilities including electronic and cyberwarfare measures is a major threat that needs to be dealt with. Counter-space capabilities are weapons that can destroy space-based objects or disrupt and interfere with space-based services through either kinetic physical attacks or electronic and cyber means. There are currently no effective regulations against them, as the OST only prohibits weapons of mass destruction (WMD) in outer space. Some states are now beginning to dangerously interpret the OST to mean that “non-WMD armaments in space do not violate international law.” Although customary international law could still be used to make the weaponization of outer space illegal, some states will likely exploit the OST loopholes. Therefore, signatories need to review and modernize the OST in two ways. First, Article IV of the OST should be expanded to include conventional weapons and other non-WMD technologies, including land-based anti-satellite weapons and other counter-space systems. Second, the OST needs to refine ambiguous wording to provide greater clarity. Important terms in the OST such as “peaceful uses of outer space” have come to have such expansive interpretations that they are not useful in restricting irresponsible actions in outer space. For instance, some have interpreted “peaceful” to suggest the “nonmilitary” use of space, while others suggest it means “nonaggressive” behavior. Unless such basic concepts are clarified, the effectiveness of the OST, any other treaty, or TCBMs will be in doubt. Formulating new rules of the road in outer space should be more inclusive. Although an inclusive approach to rulemaking is challenging, it critically leads to more buy-in from states, thus ensuring better compliance. Of course, developing an agreement involving all actors could lead to an instrument that is less than ideal because building consensus requires compromises, but ensuring more participation and endorsement is worth the effort. Processes and approaches are as important as the final outcome document. An inclusive process gives states a sense of ownership over drafting a treaty or a TCBM. The voice of emerging powers and developing countries is important in developing rule-based systems for global governance. An inclusive process that brings different stakeholders together should be pursued to ensure wider acceptability, which could lead to increased legitimacy and compliance. It will not help if this is done as an afterthought. States should develop transparency and confidence-building measures. The effort to create a Code of Conduct for Outer Space Activities in the European Union (EU) is illustrative in this respect. The substance of the EU code itself was not a problem. The code, for instance, recommended avoiding actions that create long-lasting space debris and called on states to undertake collision avoidance measures and participate in prelaunch and high-risk reentry notifications. Many countries outside the EU, such as China and India, opposed the code because they were not part of the development process. This prevented it from gaining broad support. To its credit, the EU eventually recognized the problem and reached out to other countries, but the damage was already done. This experience should be considered carefully, especially if efforts at the CD prove fruitless and geopolitical conditions do not improve. This kind of initiative of like-minded countries offers a path forward on space governance, but it needs to be done differently than the EU code. It would be useful to include a larger group of concerned countries at the start of the deliberative process. States should develop TCBMs. Reviewing and modernizing the OST will take time. Developing TCBMs could bridge the gap as an intermediate step to legal instruments, which should remain the ultimate goal. TCBMs should be seen as useful, pragmatic steps in building trust among countries. They can strengthen dialogue among multiple stakeholders and encourage openness, information sharing, and transparency. TCBMs have the flexibility to start with the least common denominator, measures that all parties agree to. These could include norms of responsible behavior, an outer space code of conduct, or GGE activity. Despite the failure of the most recent UNGGE on the Prevention of an Arms Race in Outer Space, such efforts still need to be pursued. TCBMs can be narrowly focused and start with specific measures, such as “no testing/deployment of space weapons in outer space,” before proceeding to broader issues, such as “noninterference with peaceful activities of other states.” Adopting specific TCBMs such as prelaunch notifications can also strengthen efforts to establish norms of responsible behavior and regulate activities and capabilities that are inherently destabilizing. A recent proposal from the United Kingdom (UK) on space security can be a helpful reference. The proposal, “Reducing Space Threats Through Norms, Rules and Principles of Responsible Behaviors,” aims to look at space security challenges with a bottom-up approach. One of the operative clauses in the proposal asks countries to “characterize actions and activities that could be considered responsible, irresponsible or threatening” and share their ideas on how they can be managed. That the UK proposal focuses on a behavior-based approach and does not favor a specific format for its outcome leaves reasonable flexibility for states to discuss and arrive at an advantageous outcome. States should pursue innovative multilateralism. Given the challenges surrounding the CD, states should consider setting up a body akin to the Intergovernmental Panel on Climate Change to address some of the pressing challenges in outer space. Similar to the GGE, the group could be established through a UN General Assembly resolution, but for a period of two or three years. Such a group of international experts could be mandated to review universal challenges confronting every state, including space debris, the outer space arms race, and counter-space capabilities, and produce an outcome document that can be submitted to the UN secretary-general. The group could be an inclusive platform with policy and technical experts from developing and developed countries, thus providing a voice to emerging powers. States could also consider creating an institution modeled after the International Civil Aviation Organization, given the importance of space traffic management in handling outer space affairs. Having a group of technical experts ideating possible resolutions could alleviate some of the political issues that have prevented consensus among major powers. States could also pursue smaller, technical agreements addressing a particular threat rather than attempt all-encompassing treaties, which are difficult to build support for. The United States has taken the lead in lunar exploration. The United States’ Artemis Accords are an innovative attempt at forging international cooperation, but the bilateral approach has limits. The United States has taken the lead in lunar exploration through a series of bilateral agreements, reinforcing many of the norms and principles enshrined in the OST. Although countries including Australia, Canada, Japan, the United Arab Emirates, and the United Kingdom have signed on, space powers such as China, India, and Russia have not. Geopolitical rivalry with the United States will likely prevent China from accepting these arrangements, and India and others have avoided signing on because it is not a multilateral agreement under the UN umbrella. A better approach to promoting OST norms in lunar exploration would be developed under the aegis of a multilateral entity.

### Off 4

#### **Interp: aff’s must only effect the empty regions outside the atmosphere**

New World Encyclopedia ND, "Outer space," No Publication, https://www.newworldencyclopedia.org/entry/outer\_space

Outer space (often called space) consists of the relatively empty regions of the universe outside the atmospheres of celestial bodies. Outer space is used to distinguish it from airspace and terrestrial locations. There is no clear boundary between Earth's atmosphere and space, as the density of the atmosphere gradually decreases as the altitude increases.

#### Violation: they don’t; their XX ev says

#### **Violation – they effect celestial bodies**

1AC Davis 18 Malcolm Davis .16 Jul 2018. Avoiding a free-for-all: the Outer Space Treaty revisited. <https://www.aspistrategist.org.au/avoiding-a-free-for-all-the-outer-space-treaty-revisited/> [Malcolm Davis is a senior analyst at ASPI. Edited image courtesy of the European Space Agency] // CVHS SR

One theme considered at ASPI’s recent annual Building Australia’s Strategy for Space conference was the growing importance of space law as space becomes more contested, congested and competitive. The basis of space law remains the 1967 Outer Space Treaty (OST), but a lot has happened since it was signed. Perhaps it’s time to review and refresh the treaty. Article IV of the OST states that: States Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies or station weapons in outer space in any other manner. The moon and other celestial bodies shall be used … exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden … Article IV doesn’t ban the weaponisation of space outright. Nor has there been any other legal agreement that bans such systems, despite ongoing international efforts in recent decades. US adversaries (including China and Russia) are developing a suite of sophisticated counter-space capabilities, including direct ascent and co-orbital ‘hard kill’ and ‘soft kill’ systems (see here and here). The US and its allies must respond seriously to these challenges and protect their critical space-based infrastructure. A ‘space Pearl Harbor’ could quickly remove the traditional information-based war-fighting advantage of Western liberal democracies, leaving the US and its partners deaf, dumb and blind at the outset of a conflict. Part of the solution is to bolster space deterrence, to dissuade the use of counter-space capabilities by adversaries. The US and its allies, including Australia, need to work together to achieve that objective. Strengthening the 1967 OST’s provision on space weapons is also a must, but it will be difficult to get other major space powers such as China and Russia to agree to new legal constraints on capabilities that they’re already developing and testing. It will also be difficult to get agreement on what a space weapon is and what constitutes a counter-space attack. Earth-based soft-kill systems—such as cyberattacks that could create scalable, reversible effects—offer deniability to the aggressor. Article IV bans the militarisation of the moon and other celestial bodies by states, but it has a weakness: it allows ‘use of military personnel for scientific research or for other peaceful purposes’ and includes a vague statement that ‘use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited’. Defining ‘peaceful purpose’ activities isn’t easy either, particularly when states such as China have space programs run by the military. As China looks towards crewed lunar missions by the 2030s, there’s a risk that it may exploit ‘grey zone’ phenomena on the high frontier in support of its national strategic ambitions, which include contesting the US advantage in space. The OST was signed at a time when commercial space actors simply didn’t exist. However, Article VI implies the possibility of such actors: States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by government agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. Yet that doesn’t address activities by commercial space corporations that are acting alone and independently of national guidance—or at least those that declare that they’re doing so. For example, the potential resource wealth of the moon and near-Earth asteroids opens up the prospect for private space corporations to make vast profits from those resources. Article II of the OST says, ‘Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by other means.’ But what about the actions of private corporations, perhaps supported by private security contractors, that seek to safeguard a valuable resource claim? The OST does nothing to regulate the actions of such entities. The US’s 2015 Space Act created opportunities for future lunar and asteroid mining by US commercial space companies, and US competitors aren’t likely to sit back and passively watch US companies gain an advantage. That implies a challenge to Article II of the OST, because acquiring a resource and then selling it for profit implies ownership. If Article II is weakened indirectly through commercial activity, competitors may see an opportunity to claim territory on the moon and other celestial bodies. The rationale might be control of a valuable resource or exploitation of high ground in astrostrategic terrain for military advantage. That would undermine the OST at its most fundamental level. This isn’t a justification for imposing draconian governmental or international regulation on the rapidly growing commercial space sector. Such a step would smother innovation and reduce incentives for commercial space activities, slowing the growth of a future off-Earth space industry. Going back to Space 1.0 is entirely the wrong path. The OST needs to be updated to address some of the potential risks in a more contested, congested and competitive space domain extending from low-Earth orbit out to cislunar space and beyond. That would make the treaty more relevant to the future Space 2.0 paradigm in which the fastest progress is led by the commercial sector, a significant portion of which is untethered by government direction. In particular, managing the impact of new commercial space actors that will seek access to and profit from space resources should be a high priority if the OST is to remain relevant. The 1979 Moon Treaty sought to expand on the OST and address some of its shortcomings. It wasn’t ratified by the US, the Russian Federation or China, and so isn’t binding. Alongside an updated OST, a new Moon Treaty that facilitates peaceful commercial activities on the moon and other celestial bodies would be a good step forward. But the updates need to address the shortcomings of both treaties. They should clearly delineate the boundaries between normal commercial activities in what should be a global commons and state or state-owned actors that could compete for national gain. The alternative is a free-for-all on the high frontier, with dangerous risks for major-power competition in a contested space environment.

#### Extra T is a voter:

#### Limits: Allowing celestial bodies creates an unpredictable research burden – the neg not only has to familiarize themselves with the privatization of outer space but also every planet ever – this kills limits on an already large topic

#### Ground: they kill neg ground allowing aff’s that effect planets kills neg ground through allowing aff’s to no link out of satellite and other specific DA’s – OST modernization is neg ground not aff ground

#### Predictability: literature base concludes neg – most people define outer space as in between athmospheres– including earth guts predictability for topic lit

#### Reject plan text in a vaccum it’s a terrible standard for debate:

#### 1---Allows aff teams to spike out of all T offense – even if the mechanism of the plan is not topical

#### 3--- It’s illogical. Otherwise, teams will contravene their explanation of the plan in the 2AC with no strategic consequences.

#### 4--- To preserve limits. It deletes topicality as a strategic option if they paste the resolutional wording in.

#### T is Drop the Debater – 1] it’s a fundamental baseline for debatability and 2] DTA illogical on T

#### CI – 1] Topicality is a yes/no question, you can’t be reasonably topical and 2] Reasonability invites arbitrary judge intervention and a race to the bottom of questionable argumentation.

#### No RVIs - 1] Forces the 1NC to go all-in on Theory which kills substance education, 2] Encourages Baiting since the 1AC will purposely be abusive, and 3] Illogical – you shouldn’t win for defending the topic

## Case

### Overveiw

#### REJECT all AC spikes, three reasons⁃               1.) I don’t know the implication of the spikes until the 1AR happens because they can read things like permissibility triggers, if I don’t know the implication I should be able to contest the link and implication⁃               2.) Is clash, obviously this incentivizes them to put a bunch of arguments into the 1AC that I have to respond to, the technicality of drops which means you should reject their theory spikes⁃               3.) At worst I have new 2NR responses because their application would be new, thats like reading a new impact or a link if I read like 30 disads with links and no impacts and the 1AR said you need impacts and the 2NR read a new impact to that disad it would be ridiculous⁃              1AR theory is not drop the debater its obviously context dependent things like 9 condo could be drop the debater, things like font size theory obviously aren’t — fairness does not outweigh everything categorically, just cause fairness is an impact doesn’t mean that we shouldn’t have discussions and those discussions can be weighed and those educations can be weighed on a theory level and on a procedural flawed level⁃               Don’t vote on presumption or permissibility triggers even If they affirm/ negate because that would decrease clash, it would allow them to incentivize the arguments that trigger these things instead of actual engagement with material args — killing fairness and education when answering the neg

### Proper

#### They cant solve for nuke war – their ev cites loopholes like not defining what wmd’s are --- proves that clarification doesn’t do anything

#### No space war and terrestrial conflict turns it

Luke Penn-Hall 15, Analyst at The Cipher Brief, M.A. from the Johns Hopkins School for Advanced International Studies, B.A. in International Relations and Religious Studies from Claremont McKenna College, “5 Reasons “Space War” Isn’t As Scary As It Sounds”, The Cipher Brief, 8/18/2015, https://www.thecipherbrief.com/article/5-reasons-%E2%80%9Cspace-war%E2%80%9D-isn%E2%80%99t-scary-it-sounds

The U.S. depends heavily on military and commercial satellites. If a less satellite-dependent opponent launched an anti-satellite (ASAT) attack, it would have far greater impact on the U.S. than the attacker. However, it’s not as simple as that – for the following reasons:

1. An ASAT attack would likely be part of a larger, terrestrial attack. An attack on space assets would be no different than an attack on territory or other assets on earth. This means that no space war would stay limited to space. An ASAT campaign would be part of a larger conventional military conflict that would play out on earth.

2. Every country with ASAT capabilities also needs satellites. While the United States is the most dependent on military satellites, most other countries need satellites to participate in the global economy. All countries that have the technical ability to play in this space – the U.S., Russia, China and India - also have a vested interest in preventing the militarization of space and protecting their own satellites. If any of those countries were to attack U.S. satellites, it would likely hurt them far more than it would hurt the United States.

3. Destruction of satellites could create a damaging chain reaction. Scientists warn that the violent destruction of satellites could result in an effect called an ablation cascade. High-velocity debris from a destroyed satellite could crash into other satellites and create more high-velocity debris. If an ablation cascade were to occur, it could render certain orbital levels completely unusable for centuries.

4. Any country that threatened access to space would threaten the global economy. Even if a full-blown ablation cascade didn’t occur, an ASAT campaign would cause debris, making operating in space more hazardous. The global economy relies on satellites and any disruption of operations would be met with worldwide disapproval and severe economic ramifications.

5. International Prohibits the Use of ASAT Weapons. Several international treaties expressly prohibit signatory nations from attacking other countries’ space assets. It is generally accepted that space should be treated as a global common area, rather than a military domain.

While it remains necessary for military planners to create contingency plans for a, space war it is a highly unlikely scenario. All involved parties are incentivized against attacking. However, if a space war did occur, it would be part of a larger conflict on Earth. Those concerned about the potential for war in space should be more concerned about the potential for war, period.

#### Offensive capabilities are weak, there are lots of defenses---their ev is hype

Dr. Joan Johnson-Freese 16, Ph.D. in Political Science and International Relations from Kent State University, Chair of the Department of National Security Studies at the Naval War College, and Theresa Hitchens, Senior Research Scholar at the Center for International and Security Studies and Former Director of the United Nations Institute for Disarmament Research (UNIDIR), “Stop The Fearmongering Over War In Space: The Sky’s Not Falling, Part 1”, Breaking Defense, 12/27/2016, https://breakingdefense.com/2016/12/stop-the-fearmongering-over-war-in-space-the-skys-not-falling-part-1/

Star Wars it ain’t, but the Pentagon is increasingly anxious over threats to its satellites, as we’ve reported frequently in recent years. But in this op-ed, scholars Joan Johnson-Freese and Theresa Hitchens argue that war in space is dangerously overhyped. — the editors

In the last two years, we’ve seen rising hysteria over a future war in space. Fanning the flames are not only dire assessments from the US military, but also breathless coverage from a cooperative and credulous press. This reporting doesn’t only muddy public debate over whether we really need expensive systems. It could also become a self-fulfilling prophecy. The irony is that nothing makes the currently slim possibility of war in space more likely than fearmongering over the threat of war in space.

Two television programs in the past two years show how egregious this fearmongering can get. In April 2015, the CBS show 60 Minutes ran a segment called “The Battle Above.” In an interview with General John Hyten, the then-chief of U.S. Air Force Space Command, it came across loud and clear that the United States was being forced to prepare for a battle in space — specifically against China — that it really didn’t want.

Gen. John Hyten: It’s a competition that I wish wasn’t occurring, but it is. And if we’re threatened in space, we have the right of self-defense, and we’ll make sure we can execute that right.

David Martin: And use force if necessary.

Gen. John Hyten: That’s why we have a military. You know, I’m not NASA.

It was explained by Hyten and other guests that China is building a considerable amount of hardware and accumulating significant know-how regarding space, all threatening to space assets Americans depend on every day. If viewers weren’t frightened after watching the segment, it wasn’t for lack of trying on the part of CBS.

Using terms like “offensive counterspace” as a 1984 NewSpeak euphemism for “weapons,” it was made clear that the United States had no choice but to spend billions of dollars on offensive counterspace technology to not just thwart the Chinese threat, but control and dominate space. While it didn’t actually distort facts — just omit facts about current U.S. space capabilities — the segment was basically a cost-free commercial for the military-industrial complex.

In retrospect though, “The Battle Above” was pretty good compared to CNN’s recent special, War in Space: The Next Battlefield. The latter might as well have been called Sharknado in Space – because the only far-out weapons technology our potential adversaries don’t have, according to the broadcast, seems to be “sharks with frickin’ laser beams attached to their heads!”

First, CNN needs to hire some fact checkers. Saying “unlike its adversaries, the U.S. has not yet weaponized space” is deeply misleading, like saying “unlike his political opponents, President-Elect Donald Trump has not sprouted wings and flown away”: A few (admittedly alarming) weapons tests aside, no country in the world has yet weaponized space. Contrary to CNN, stock market transactions are not timed nor synchronized through GPS, but a closed system. Cruise missiles can find their targets even without GPS, because they have both GPS and precision inertial measurement units onboard, and IMUs don’t rely on satellite data. Oh, and the British rock group Pink Floyd holds the only claim to the Dark Side of the Moon: There is a “far side” of the Moon — the side always turned away from the Earth — but not a “dark side” — which would be a side always turned away from the Sun.

More nefariously, the segment sensationalized nuggets of truth within a barrage of half-truths, backed by a heavy bass, dramatic soundtrack (and gravelly-voiced reporter Jim Sciutto) and accompanied by sexy and scary visuals.

Make no mistake there are dangers in space, and the United States has the most to lose if space assets are lost. The question is how best to protect them. Here are a few facts CNN omitted.

The Reality

The U.S. has all of the technologies described on the CNN segment and deemed potentially offensive: maneuverable satellites, nano-satellites, lasers, jamming capabilities, robotic arms, ballistic missiles that can be used as anti-satellite weapons, etc. In fact, the United States is more technologically advanced than other countries in both military and commercial space.

That technological superiority scares other countries; just as the U.S. military space community is scared of other countries obtaining those technologies in the future. The U.S. military space budget is more than 10 times greater than that of all the countries in the world combined. That also causes other countries concern.

More unsettling still, the United States has long been leery of treaty-based efforts to constrain a potential arms race in outer space, as supported by nearly every other country in the world for decades. Indeed, under the administration of George W. Bush, the U.S. talking points centered on the mantra “there is no arms race in outer space,” so there is no need for diplomat instruments to constrain one. Now, a decade later, the U.S. military – backed by the Intelligence Community which operates the nation’s spy satellites – seems to be shouting to the rooftops that the United States is in danger of losing the space arms race already begun by its potential adversaries. The underlying assumption — a convenient one for advocates of more military spending — is that now there is nothing that diplomacy can do.

However, it must be remembered that most space-related technologies – with the exception of ballistic missiles and dedicated jammers – have both military and civil/commercial uses; both benign — indeed, helpful — and nefarious uses. For example, giving satellites the ability to maneuver on orbit can allow useful inspections of ailing satellites and possibly even repairs.

Further, the United States is not unable to protect its satellites, as repeated during the CNN broadcast by various interviewees and the host. Many U.S. government-owned satellites, including precious spy satellites, have capabilities to maneuver. Many are hardened against electro-magnetic pulse, sport “shutters” to protect optical “eyes” from solar flares and lasers, and use radio frequency hopping to resist jamming.

Offensive weapons, deployed on the ground to attack satellites, or in space, are not a silver bullet. To the contrary, U.S. deployment of such weapons may actually be detrimental to U.S. and international security in space (as we argued in a recent Atlantic Council publication, Towards a New National Security Space Strategy). Further, there are benefits to efforts started by the Obama Administration to find diplomatic tools to restrain and constrain dangerous military activities in space.

These diplomatic efforts, however, would be undercut by a full-out U.S. pursuit of “space dominance.” This includes dialogue with China, the lack of which Gen. William Shelton, retired commander of Air Force Space Command, lamented in the CNN report.

Given CNN’s “cast,” the spin was not surprising. Starting with Ghost Fleet author Peter Singer set the sensationalist tone, which never altered. The apocalyptic opening, inspired by Ghost Fleet, posited a scenario where all U.S. satellites are taken off-line in nearly one fell swoop. Unless we are talking about an alien invasion, that scenario is nigh on impossible. No potential adversary has such capabilities, nor will they ever likely do so. There is just too much redundancy in the system.

#### Deterrence and interdependence check

Kyle L. Evanoff 19, Research Associate for International Institutions and Global Governance at the Council on Foreign Relations, “Big Bangs, Red Herrings, and the Dilemmas of Space Security”, Council on Foreign Relations, 6/27/2019, https://www.cfr.org/blog/big-bangs-red-herrings-and-dilemmas-space-security

Analysts pointed to Mission Shakti as a vivid example of growing contestation in the outer space domain. Traditional U.S. dominance in space has eroded as a litany of foreign actors (collaborator and competitor alike) have increased their spacefaring prowess, including through the development and use of ASAT weapons and dual-use uncrewed orbiters capable of space rendezvous and proximity operations [PDF]. Pundits fear that such space technologies could alter the calculus of deterrence to inauspicious effect or, worse, become instruments in an adversary’s enactment of a “space Pearl Harbor.” These fears are valid in some senses, overblown and misleading in others. Developments in space pose significant challenges for strategic stability. Obsessive concern with the remote contingency of kinetic warfare in orbit, however, detracts from efforts to address more pressing space security issues and makes catastrophic outcomes more, not less, probable.

Missiles and Lasers and Viruses, Oh My

Recent years have witnessed burgeoning democratization in the outer space domain as plummeting costs—both for manufacturing satellites and placing them in orbit—and proliferating technologies have enabled new spacefaring actors to deploy assets in Earth orbit. The number of active satellites has ballooned to more than two thousand, and their integration into military operations and civil life has deepened in tandem. Recognition of the indispensability of these orbital assets to numerous areas of strategic competition, and defense planners’ emphasis on offensive capabilities as a deterrence measure, has led states to invest large sums in the development of ASAT weapons of various stripes.

In their April Space Threat Assessment 2019 [PDF] report, Todd Harrison, Kaitlyn Johnson, and Thomas G. Roberts of the Center for Strategic and International Studies outline four categories of counterspace operations: kinetic physical attacks, non-kinetic physical attacks, electronic attacks, and cyberattacks. This litany of potential threats, which vary in their severity, reversibility, ease of attribution, and other aspects, makes U.S. policymakers uneasy. After over half a century of spacefaring pre-eminence, the United States has come to depend on the remote-sensing, telecommunications, and positioning, navigation, and timing capabilities that satellites provide. The resounding defeat of the Iraqi military by American and coalition forces during the Gulf War of the early 1990s underscored the substantial battlefield advantages that orbital capabilities confer, and numerous subsequent conflicts have affirmed the U.S. military’s tactical and strategic reliance on space assets. Proliferating counterspace systems heighten the potential for adversaries to disrupt American command, control, and communications networks, as well as surveillance and reconnaissance operations. In attacking these critical space systems, U.S. adversaries could compromise large segments of the national defense enterprise.

Indeed, an insecure orbital environment poses significant challenges for broader strategic stability. Actors in possession of counterspace capabilities can threaten or attack vital elements of ballistic missile launch detection architectures and other systems integral to national and international security, which opens new avenues for intentional, inadvertent, or accidental dispute or conflict escalation. In this sense, novel satellite vulnerabilities add layers of technical and psychological complexity to already labyrinthine deterrence calculations. The effect compounds in light of the deep integration of satellites into information and communications networks: cyber intrusions into space systems are a tantalizing option for state and nonstate actors, and such operations carry their own elaborate deterrence considerations, not least the difficulty of attribution. The net result is a convoluted deterrence landscape, rife with uncertainty and in constant motion thanks to the rapid clip and often competitive character of technological innovation.

Swords of Many Edges

For staunch deterrence advocates, this uncertainty justifies expanding counterspace arsenals. In their view, preventing a space Pearl Harbor in which a U.S. adversary launches a crippling surprise attack against American orbital assets requires evincing the certainty of a devastating counterattack. One way of accomplishing this is through the unambiguous demonstration of effective counterspace capabilities. The clearer the demonstration, the better. In this sense, ASAT missile tests, which are easy to attribute and spectacular in nature, hold great allure as a means of signaling orbital strike capabilities.

Such tests, however, come with significant drawbacks. The most obvious of these is that they generate large amounts of dangerous space debris, which pose serious hazards to spacecraft. Each new fragment requires monitoring and, in cases of potential collisions, risk assessment and avoidance maneuvers. Debris-generating military operations, in this sense, are a self-defeating proposition. ASAT missile tests also come with nebulous reputational costs, as the corpus of international space law, including the 1967 Outer Space Treaty, emphasizes that uses of space should be peaceful in nature. Likewise, UN Debris Mitigation Guidelines [PDF] affirm the importance of minimizing space junk, a dictum inconsistent with kinetic weapons testing. Western media heaped scorn on India for its violation of the important, if incipient, norm against debris generation, even after the country took pains to destroy a low-altitude satellite in order to minimize the lifespan of the bulk of the fragments.

Another important consideration for would-be ASAT testers lies in the potential for space militarization to ignite or exacerbate international arms races. Although military activities have been a persistent feature of the Space Age, those activities have often furthered peaceful as much as warlike pursuits, as has been the case with many remote-sensing operations and the opening of the U.S. Global Positioning System to civilian use. Militarization is a process rather than a state of affairs, and one that takes various forms at that. Deterrence implications notwithstanding, the development and deployment of counterspace capabilities can drive potential adversaries to develop and deploy similar capabilities, contributing to the erosion of norms of peaceful use.

Some military planners and policymakers’ assertions to the contrary, space is at present less a domain of warfighting than a domain of deep interdependence. The value of combat support functions performed from space, as important as they are to battlefield success, pales in comparison to that of other satellite-facilitated services, which are vital to myriad aspects of contemporary global society. Common space security interests include minimizing debris-generation, coordinating on satellite placement and radio-frequency spectrum use, monitoring terrestrial and space weather and the global environment, ensuring the integrity of global navigation satellite systems, tracking licit and illicit ground, air, and maritime movements, scanning for hazardous comets and asteroids, and conducting scientific observations and experiments. Many of these require states to work together to maximize benefits and minimize risks. Perceptions that one or more countries are attempting in systematic fashion to exert dominance and preclude other actors’ access to the domain and its benefits, then, carry significant dangers. They bend state behavior toward aggression and actual warfighting.

Security in the Heavens and on Earth

National governments, including that of the United States, should be careful not to make active contributions to such perceptions. Although low-level grey zone aggression has become commonplace for space-linked systems due to the relative ease and reversibility of many cyber and electronic attacks, space remains free of kinetic combat at present, as a recent Secure World Foundation report [PDF] emphasizes. Rather than responding to limited attacks by expanding counterspace arsenals, which carries the risk of contributing to arms race dynamics, U.S. and allied policymakers should accept some amount of limited aggression as more or less inevitable. They should place more emphasis on diplomacy—not weaponry—as a tool in mitigating these sorts of attacks. The United States should work with other spacefaring powers to reach consensus on non-binding rules of the road for space, using the International Code of Conduct for Outer Space Activities [PDF] that the European Union proposed in 2008 as a rough starting point. While new international law could be a greater boon still, formal UN discussions on the Prevention of an Arms Race in Outer Space have yielded little progress since the mid-1980s. A joint Chinese-Russian proposal for a Treaty on the Prevention of the Placement of Weapons in Outer Space, for instance, has significant shortcomings and has drawn open condemnation from the United States. Such paralysis, in tandem with the Trump administration’s and U.S. Senate Republicans’ disdain of multilateral treaties, makes a formal agreement a farfetched proposition for now.

More important, U.S. policymakers should avoid making decisions on the basis of a possible, though highly improbable, space Pearl Harbor. They should recognize that latent counterspace capabilities—as exemplified in 2008’s Operation Burnt Frost, which saw the United States repurpose a ballistic missile interceptor to destroy a satellite—are more than sufficient to deter adversaries from launching a major surprise attack in almost all scenarios, especially in light of the aforementioned deep interdependence in the space domain. Adding to the deterrence effect are uncertain offensive cyber capabilities. The United States continues to launch incursions into geopolitical competitors’ critical systems, such as the Russian power grid, and has demonstrated a willingness to employ cyberattacks in the wake of offline incidents, as it did after Iran shot down a U.S. drone last week. Unlike in the nuclear arena, where anything short of the prospect of nuclear retaliation holds limited dissuasive power, space deterrence can stem from military capabilities in various domains. For this reason, an attack on a U.S. satellite could elicit any number of responses. The potential for cross-domain retaliation, combined with the high strategic value of space assets, means that any adversary risks extreme escalation in launching a major assault on American space architectures. Again, well-conceived diplomatic efforts are useful in averting such scenarios altogether.

#### No miscalc or escalation

James Pavur 19, DPhil Researcher at the Cybersecurity Centre for Doctoral Training at Oxford University, and Ivan Martinovic, Professor of Computer Science in the Department of Computer Science at Oxford University, “The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space”, 2019 11th International Conference on Cyber Conflict: Silent Battle, https://ccdcoe.org/uploads/2019/06/Art\_12\_The-Cyber-ASAT.pdf

A. Limited Accessibility

Space is difficult. Over 60 years have passed since the first Sputnik launch and only nine countries (ten including the EU) have orbital launch capabilities. Moreover, a launch programme alone does not guarantee the resources and precision required to operate a meaningful ASAT capability. Given this, one possible reason why space wars have not broken out is simply because only the US has ever had the ability to fight one [21, p. 402], [22, pp. 419–420].

Although launch technology may become cheaper and easier, it is unclear to what extent these advances will be distributed among presently non-spacefaring nations. Limited access to orbit necessarily reduces the scenarios which could plausibly escalate to ASAT usage. Only major conflicts between the handful of states with ‘space club’ membership could be considered possible flashpoints. Even then, the fragility of an attacker’s own space assets creates de-escalatory pressures due to the deterrent effect of retaliation. Since the earliest days of the space race, dominant powers

#### No internal link to climate- the notion that space laynches are te only thing is not true

Alt causes

#### No climate impact

Amber Kerr et al. 19 (Amber Kerr is an agroecologist with a PhD from UC Berkeley, and was the coordinator of the USDA California Climate Hub, based at the University of California, Davis, Daniel Swain is a Climate Scientist at UCLA, Andrew King is a lecturer in Climate Science and ARC DECRA fellow at the School of Earth Sciences and ARC Centre of Excellence for Climate Extremes, University of Melbourne, Peter Kalmus is an American climate scientist and data scientist at NASA's Jet Propulsion Laboratory, Richard Bettis is Chair in Climate Impacts at the University of Exeter and Head of Climate Impacts in the Met Office Hadley Centre, 6/4/19, accessed 11/17/21, “Claim that human civilization could end in 30 years is speculative, not supported with evidence”, https://climatefeedback.org/evaluation/iflscience-story-on-speculative-report-provides-little-scientific-context-james-felton/)AGabay

There is no scientific basis to suggest that climate **breakdown will** “annihilate intelligent **life**” (by which I assume the report authors mean **human** **extinction**) by 2050. However, climate breakdown does pose a grave threat to civilization as we know it, and the potential for mass suffering on a scale perhaps never before encountered by humankind. This should be enough reason for action without any need for exaggeration or misrepresentation! A “Hothouse Earth” scenario plays out that sees Earth’s temperatures doomed to rise by a further 1°C (1.8°F) even if we stopped emissions immediately. Peter Kalmus, Data Scientist, Jet Propulsion Laboratory This word choice perhaps reveals a bias on the part of the author of the article. A temperature can’t be doomed. And while I certainly do not encourage false optimism, assuming that humanity is doomed is **lazy** and counterproductive. Fifty-five percent of the global population are subject to more than 20 days a year of lethal heat conditions beyond that which humans can **survive** Richard Betts, Professor, Met Office Hadley Centre & University of Exeter: This is clearly from Mora et al (2017) although the report does not include a citation of the paper as the source of that statement. The way it is written here (and in the report) is misleading because it gives the impression that everyone dies in those conditions. That is not actually how Mora et al define “deadly heat” – they merely looked for heatwaves when somebody died (not everybody) and then used that as the definition of a “deadly” heatwave. North America suffers extreme weather events including wildfires, drought, and heatwaves. Monsoons in China fail, the great rivers of Asia virtually dry up, and rainfall in central America falls by half. Andrew King, Research fellow, University of Melbourne: Projections of extreme events such as these are very difficult to make and **vary greatly** between differentclimate **models**. Deadly heat conditions across West Africa persist for over **100 days a year** Peter Kalmus, Data Scientist, Jet Propulsion Laboratory: The deadly heat projections (this, and the one from the previous paragraph) come from Mora et al (2017)1. It should be clarified that “deadly heat” here means heat and humidity beyond a two-dimension threshold where at least one person in the region subject to that heat and humidity dies (i.e., not everyone instantly dies). That said, in my opinion, the projections in Mora et al are conservative and the methods of Mora et al are sound. I did not check the claims in this report against Mora et al but I have no reason to think they are in error. 1- Mora et al (2017) Global risk of deadly heat, Nature Climate Change The knock-on consequences affect national security, as the scale of the challenges involved, such as pandemic disease outbreaks, are overwhelming. Armed conflicts over resources may become a reality, and have the potential to escalate into nuclear war. In the worst case scenario, a scale of destruction the authors say is beyond their capacity to model, there is a ‘high likelihood of human civilization coming to an end’. Willem Huiskamp, Postdoctoral research fellow, Potsdam Institute for Climate Impact Research: This is a highly questionable conclusion. The reference provided in the report is for the “Global Catastrophic Risks 2018” report from the “Global Challenges Foundation” and not peer-reviewed literature. (It is worth noting that this latter report also provides no peer-reviewed evidence to support this claim). Furthermore, if it is apparently beyond our capability to model these impacts, how can they assign a ‘high likelihood’ to this outcome? While it is true that warming of this magnitude would be catastrophic, making claims such as this without evidence serves only to undermine the trust the public will have in the science. Daniel Swain, Climate Scientist, University of California, Los Angeles: It seems that the eye-catching headline-level claims in the report stem almost entirely from these **knock-on effects**, which the authors themselves admit are “beyond their **capacity** to **model**.” Thus, from a scientific perspective, the purported “high likelihood of civilization coming to an end by 2050” is essentially personal **speculation** on the part of the report’s authors, rather than a clear conclusion drawn from **rigorous assessment** of the available **evidence**.

**Models are wrong AND are exaggerated**

Vijay Jayaraj 21 (Vijay Jayaraj has a M.Sc., Environmental Science, University of East Anglia, England), Research Contributor for the Cornwall Alliance for the Stewardship of Creation, 3/11/21, accessed 10/17/21, “Why I Am a Climate Realist”, https://cornwallalliance.org/2021/03/why-i-am-a-climate-realist/)AGabay

The answer to my question trickled in slowly over a number of years. Evidence began to emerge that **scientists** **acknowledged** a large **gap** between the **actual** **observed** real-world temperature datasets (from satellites) and those temperature predictions from **computer climate models**. While these differences may not prove the allegations against the Climategate scientists, they do confirm one thing: the computer climate models exaggerate the future warming rate due to their high sensitivity to carbon dioxide emissions. As a result, the models continue to show an excessive and unreal warming rate for future decades. Despite plenty of evidence, the IPCC continues to use these **faulty model predictions** to inform the **public** and **policymakers** about future changes in temperature. A steady stream of scientific studies has documented the **evidence for lack of dangerous warming**—IPCC’s level of warming based on fifth- and sixth-generation (CMIP5 and CMIP6) models and the apparent absence of climate-induced ecological collapse. In 2020 alone, over 400 peer**-reviewed scientific papers** took up a **skeptical position** on **climate** **alarmism**. These papers—and hundreds from previous years—address various issues related to climate change, including problems with climate change observation, climate reconstructions, lack of anthropogenic/CO2 signal in sea-level rise, natural mechanisms that drive climate change (solar influence on climate, ocean circulations, cloud climate influence, ice sheet melting in high geothermal heat flux areas), hydrological trends that do not follow modeled expectations, the fact that corals thrive in warm, high-CO2 environments, elevated CO2 and higher crop yields, no increasing trends in intense hurricanes and drought frequency, the myth of mass extinctions due to global cooling, etc. Academia is filled with scientific literature that **contradicts** the position of those who believe climate change is **unprecedented**. Also, during the course of the last decade, it became apparent that most of Al Gore’s claims in his 2006 documentary were false. Contrary to his claims, polar bear populations remained steady, the Arctic did not become ice free during the summer of 2014, and storms did not get stronger due to global warming. In simple words, Gore misled the world and promoted falsehood as science, and he continues to do so while profiting from a renewable industry that is sold as the cure for global warming. Yet, he himself generates carbon dioxide emissions many times higher than an average family’s. So, not only are the predictions of models wrong, but also the interpretations of climate data and the propaganda of a climate doomsday were also wrong. Today, we know the modern warming rate is not **unprecedented**. Warming of such magnitude has **happened twice** within the past **2000** **years**. Further, ice at both poles is at historic highs, even compared with the Little Ice Age of the 17th century. Besides, there has been no increase in extreme weather events due to climate change and the loss of lives due to environmental disasters has drastically reduced during the last 100 years. So, I am a climate realist. I acknowledge that there has been a gradual increase in global average temperature since the end of the Little Ice Age in the 17th century. I acknowledge that climate change can happen in both ways—warming and cooling. I do understand that anthropogenic CO2 emissions and other greenhouse gases could have positively contributed to the warming from mid-20th century onwards. I also acknowledge that warming and the increased atmospheric carbon dioxide that has contributed to it have actually helped society. The current atmospheric carbon dioxide concentration, nearly 50 percent higher than in the 17th century, and the warming—which has occurred chiefly in winter, in higher latitudes and altitudes, and at night, thus raising cold temperatures but with little effect on hot temperatures—have actually resulted in optimal conditions for global plant growth, thus aiding in the flourishing of the agricultural sector. The Bengal tiger populations have bounced back, and polar bear populations are steady, thanks to conservation efforts. Forest area in Europe is increasing every year, and countries are planting tree saplings at a record rate. Life expectancy has reached all-time highs in many countries, and more people are constantly pulled out of extreme poverty every year (although business lockdowns to fight COVID-19 threaten to reverse that trend). Access to freshwater has improved and human productivity has increased drastically. So, there is no actual **climate emergency**. Instead, what we have are celebrities, activists, un-elected political bodies like the UN, and even some climate scientists religiously promoting a popular doomsday belief. The models do not know the future, and neither do the Climategate scientists. But an exaggerated view of **future** warming provides the ideal background for anti-carbon-based fuels policies that will undermine the **economic well-being** of every society in the world. We must not allow that.