## 1NC

### 1NC – OFF

#### 1] Interp – Unjust refers to a negative action – it means contrary.

Black Laws No Date "What is Unjust?" <https://thelawdictionary.org/unjust/> //Elmer

Contrary to right and justice, or to the enjoyment of his rights by another, or to the standards of conduct furnished by the laws.

#### The Last line of 1AC Babcock definitively proves the violation – the aff creates things external to the resolution like limited use of private property, tradable property rights, and the creation of a management regime in outer space

Babcock 19 [Hope M. Babcock, Professor Babcock served as general counsel to the National Audubon Society from 1987-91 and as deputy general counsel and Director of Audubon’s Public Lands and Water Program from 1981-87. Previously, she was a partner with Blum, Nash & Railsback, where she focused on energy and environmental issues, and an associate at LeBoeuf, Lamb, Leiby & MacRae where she represented utilities in the nuclear licensing process. From 1977-79, she served as a Deputy Assistant Secretary of Energy and Minerals in the U.S. Department of the Interior. Professor Babcock has taught environmental and natural resources law as a visiting professor at Pace University Law School and as an adjunct at the University of Pennsylvania, Yale, Catholic University, and Antioch law schools. Professor Babcock was a member of the Standing Committee on Environmental Law of the American Bar Association, and served on the Clinton-Gore Transition Team, 2019, Syracuse Law Review, https://scholarship.law.georgetown.edu/facpub/2201] simha

The PTD offers both an approach for managing an open access commons and a gap-filling tool until a regulatory regime is adopted.507 The doctrine is based on the idea that the “sovereign holds certain common properties in trust in perpetuity for the free and unimpeded use of the general public.”508 The public’s right to access and use trust resources is never lost, and neither the government nor private individuals can alienate or otherwise adversely affect those resources unless for a comparable public purpose.509 The resources the doctrine protects “have long been part of a ‘taxonomy of property’ [that recognizes] the division of natural wealth into private and public property.”510 “The doctrine places on governments ‘an affirmative, ongoing duty to safeguard the long-term preservation of those resources for the benefit of the general public,’”511 thus limiting the sovereign’s power on behalf of both present and future individuals.512 It directs the government to manage trust resources for public benefit, not private gain.513 It applies to private as well as public resources and is used to preserve the public’s access to CPRs.514 Government agencies have the non-rescindable power to revoke uses of trust resources that are inconsistent with the doctrine.515 This effectively places a permanent easement over trust resources that burdens their ownership with an overriding public interest in the preservation of those resources.516 However, trust resources can be alienated in favor of private ownership, if the alienation will still serve the public’s interest in those resources and not interfere with trust uses of the remaining land.517 The PTD, therefore, protects the “people’s common heritage,”518 just as Article 11 of the Moon Treaty protects outer space as part of the common heritage of mankind.519 The doctrine also appears to be infinitely malleable. Original uses of the doctrine were restricted to only that “aspect of the public domain below the low-water mark on the margin of the sea and the great lakes, the waters over those lands, and the waters within rivers and streams of any consequence,”520 and covered only traditional uses of those lands, like fishing and navigation.521 Over time, the scope and application of the doctrine broadened to protect more public resources and different uses.522 Thus, the doctrine expanded to protect new trust resources, such as dry sand beaches, inland lakes, groundwater, dry riverbeds, and wildlife,523 and passive uses of those resources, like scientific study.524 The original link to navigable water and tidelands disappeared.525 Supporters of the doctrine successfully advocated that it be applied to “wildlife, parks, cemeteries, and even works of fine art,”526 while arguing more recently its application to the atmosphere.527 A doctrine that imposes a perpetual duty on the sovereign to preserve trust resources, prevents their alienation for private benefit, assures public access to them, and can be invoked by anyone seems particularly useful as a management tool in outer space.528 The fact that public access to trust resources is so central to the doctrine makes it reflective, not contradictory, of international space law’s bar against appropriation of outer space and of the principle of space being the “province of all mankind.”529 It avoids the problems of alienation and exclusion associated with any of the management approaches associated with some form of private property and requires neither the creation of a new administrative authority nor the presence of a close-knit group of like-minded people.530 Members of the public, both rich and poor, can invoke and enforce the doctrine as easily as the sovereign.531 It is cost effective to the extent that no separate apparatus is required to implement it, and the doctrine has shown itself to be highly adaptable and innovative as different needs arise.532 It could also fill the gap in international law with respect to managing celestial property. Therefore, of all the management approaches studied here, the PTD seems the most suited to keep order in space until a regulatory regime is imposed. However, the doctrine provides no incentives for development of trust resources; rather, it might be used to limit or curtail that development, making it an imperfect, perhaps even counter-productive solution by itself to the extent that such development might be beneficial.533 Modifying the doctrine to allow limited use of private property management approaches, like tradable development claims, might buffer that effect—a form of overlapping hybridity between one type of property, a commons, and a management regime from another, private property, enabled by application of the PTD.

#### Here's another recutting of babcock that proves they require a ton of steps external to the plan

Babcock 19 (, H., 2019. THE PUBLIC TRUST DOCTRINE, OUTER SPACE, AND THE GLOBAL COMMONS: TIME TO CALL HOME ET. [online] Lawreview.syr.edu. Available at: <https://lawreview.syr.edu/wp-content/uploads/2019/09/H-Babcock-Article-Final-Document-v2.pdf#page=67> [Accessed 15 December 2021] Professor Babcock served as general counsel to the National Audubon Society from 1987-91 and as deputy general counsel and Director of Audubon’s Public Lands and Water Program from 1981-87. Previously, she was a partner with Blum, Nash & Railsback, where she focused on energy and environmental issues, and an associate at LeBoeuf, Lamb, Leiby & MacRae where she represented utilities in the nuclear licensing process. From 1977-79, she served as a Deputy Assistant Secretary of Energy and Minerals in the U.S. Department of the Interior. Professor Babcock has taught environmental and natural resources law as a visiting professor at Pace University Law School and as an adjunct at the University of Pennsylvania, Yale, Catholic University, and Antioch law schools. Professor Babcock was a member of the Standing Committee on Environmental Law of the American Bar Association, and served on the Clinton-Gore Transition Team.)-rahulpenu

Definitions of space sustainability The Secure World Foundation defines **space** **sustainability** as “ensuring that all humanity can continue to use outer space for peaceful purposes and socioeconomic benefit.”39 It is also described as “the ability of all humanity to continue to use outer space for peaceful purposes and socioeconomic benefit over the **long** **term**.” It is proposed that, read together, these broad definitions take as their premise that: (1) all humanity thus far is using space for peaceful purposes and for socioeconomic benefit; (2) this use is threatened; (3) measures must be taken to protect it; and (4) all humanity currently possesses the ability, in the sense of having a skill or the capacity, to ensure space sustainability for peaceful purposes. Under this conceptualization, the negative effect of not using space sustainably is primarily economic.40 Bearing in mind the governmental origins of space exploitation, where market economics did not play a primary role in decision making, the growing focus on the economic perspective in space affairs acknowledges Carolyn Deere’s opinion that problems emerge in the international domain from an absence of powerful economic interests.41 Of course, as more space applications are developed, economic interests become more prevalent in that market protectionism then underlies the rationales for many positions taken. Space sustainability is also conceptualized as defining good behavior, its boundaries, and disincentives for negative behavior in space.42 Space sustainability then becomes a much more limited political concept calling for specific measures to strengthen norms.43 Some notable examples follow: An International Code of Conduct—the European Union proposed a non-binding voluntary code whose purpose is “security, safety, sustainability” for all space activities providing for general measures on space operations and space debris.44 The Scientific and Technical Subcommittee of UNCOPUOS working group objective of establishing guidelines for the long-term sustainability of outer space activities. Proposed International Civil Aviation Organization for Space—the establishment of an international organization focused on space safety and the establishment of binding safety standards similar to the International Civil Aviation Organization.45 Industry efforts for a global space situational awareness database Group of Governmental Experts (GGE) on Transparency and Confidence Building Measures. Depending on the forum for discussion and in line with the previously mentioned initiatives, the concept of space sustainability is also used interchangeably with the following: (1) space security, which entails access to space and freedom from threats;46 (2) space stability addressing space situational awareness;47 (3) space **safety**, which is **protection** **from** all unreasonable levels of **risk** (primarily protection of humans or human activities);48 and (4) responsible uses of space.49 These all reflect the two components of space sustainability as described by the founder of Secure World Foundation: “the first is the physical environment, which includes management of space debris, electromagnetic and physical crowding and congestion, and space weather.... The second component is the political environment, and includes promoting stability and preventing conflict between nations.”50 Bearing this in mind and notwithstanding the potential confusion caused by the interchangeability of terms used, at the core of all proposals conceptualizing space sustainability or related concepts are the notions that: (1) space assets are kept safe and secure, and that the assets are not harmed or interfered with; (2) peaceful space activities continue as free from purposeful/intentional or unintentional harmful interference; (3) the space environment is preserved for peaceful uses; and (4) international cooperative efforts are required. These four points are understood to be the current core conditions for and of space sustainability. It must be acknowledged that space sustainability, in this context, is severed from the ecological roots of sustainable development. Rationale for space sustainability The proposed baseline conditions for the current conception for space sustainability coincide with Gallagher’s analysis of the logic for space cooperation as “Space Governance for Global Security” where all space actors seek “to secure the space domain for peaceful use; to protect space assets from all hazards; and to derive maximum value from space for security, economic, civil, and environmental ends.”51 Based on this understanding, the current conception of and rationale for space sustainability ties more clearly to global security than to sustainable development. This logic emphasizes that “the more different countries, companies, and individuals depend on space for a growing array of purposes, the more they need equitable rules, shared decision-making procedures, and effective compliance mechanisms to **maximize** the **benefits** that they all can gain from space, while minimizing risks from irresponsible space behaviors or deliberate interference with legitimate space activities.”52 While it is acknowledged that such a need exists, the difficulty in reaching agreement on how to bring it about is one reason why some states are more focused on producing a dialogue on long-term sustainability. This is seen in the proliferation of reports outlining best practices and options that enhance sustainability through increased information sharing, as well as a focus on technical issues rather than on the creation of any new legal regimes. To minimize some of the risks of non-sustainable space use, Weeden53 proposes a three-pillar technical approach to space sustainability: (1) debris mitigation; (2) debris removal; and (3) space traffic management. This is conjoined with an immediate need for data in support of conjunction assessment and collision avoidance. This emphasis on data sharing/collection includes enabling research into potential solutions to the problem of space debris, and enhancing transparency and cooperation among states. Weeden also suggests that this narrow approach to space sustainability serves both to educate space actors about the severity of the space debris problem and to provide stability to reduce the likelihood of conflict. A common approach to data also serves as verification for a potential code of conduct in space, setting the stage for future space governance models. These proposals follow the logic of sustainability for global security**.** While this logic is in line with the dominant conceptualization of benefit sharing and freedom of outer space, the position taken in this article is that it does not adequately speak to sustainability from the perspective ofaspirant space states. To do so requires a significantly broader discussion and solutions aimed towards aligning space law and policy with the sustainable development paradigm, if understood as being an inclusive paradigm and not focused on the individualistic/self-interested nature of the current conception of sustainable development. A systemic, sustainable development law approach calls for a conscious engagement with the web of overlapping social, environmental, cultural, and legal frameworks, as well as cultural considerations, economic policies, expectations, players, and interests.54 Bearing in mind current U.S. space policy,55 such a broad overarching objective may not be achievable as part of the dialogue on the “Long Term Sustainability of Outer Space Activities,” but U.S. policy regarding preservation of the space environment nevertheless offers insights because international initiatives congruent with it are likely to garner the most support. Schrogl56 proposed that sustainability is rendered to threats and risks to satellite operations. This approach acknowledges the intersection of multiple issue areas: environment, security, mobility, knowledge, resources, and energy. This intersection of issue areas is more akin to the wider discourse of sustainability development of and on the Earth, and prompts a discussion of value to emerging and aspirant space actors. Otherwise, the dominant conceptualization of space sustainability removes any focus upon providing for the needs of those not among the most advanced space nations. This problem is highlighted in Peter and Rathgeber’s definition of space sustainability: Sustainable space activities can be seen as activities (in space, from space, through space and towards space) that meet the needs of the present space actors without comprising the ability of future generations to meet their own needs of performing space related operations safely.57 Peter and Rathgeber claim that the emergence of new institutional space actors, particularly from the south, is putting a greater pressure on the space environment and that the participation of the south in space sustainability efforts is unsatisfactory.58 Yet, the role of less-advanced nations in sustainability initiatives is more so on the receiving end in that advanced nations seek to engage newcomers to space during the early phase of the development of future directives and codes of conduct for sustainable space activities; that is, not really to seek their input, but to ensure compliance by the less-advanced nations.59 Their space activities are judged as either threats to or consistent with space sustainability, rather than as part of articulating the content of space sustainability.60 This indicates that, for national space programs of established space nations, a truly international focus on space sustainability is not a priority. It is interesting to note, at this juncture in the discussion, a fundamental provision proposed by a group of developing states during the development of the U.N. Space Benefits Declaration.61 (1) All States should pursue their activities in Outer Space with due regard to the need to preserve Outer Space, in such a way as not to hinder its continued utilization and exploration. (2) States should pay attention to all aspects related to the protection and preservation of the Outer Space environment, especially those potentially affecting the Earth’s environment. (3) States with relevant space capabilities and with programs for the utilization and exploration of outer space should share with developing countries on an equitable basis the scientific and technological knowledge necessary for the proper development of programs oriented to the more rational utilization and exploration of Outer Space.62 Paragraph 3 is fundamental and truly revealing when read in the light of the analysis of Schrogl.63 Schrogl claims that the declaration takes up the problem of space debris, which might endanger future space utilization to a significant extent. However, he also states that “the wish [of the Developing countries] to be informed about debris prevention measures voiced. . . is reasonable but actually needs no mentioning since these technological developments are discussions and documented publicly to the greatest extent.”64

#### 2] Violation – a] The Aff is a positive action – it creates a new concept for Space i.e. the treating of Space under the public trust doctrine b] the aff creates a new property rights regime to manage private property claims

#### 3] Standards –

#### a] Limits – making the topic bi-directional explodes predictability – it means that Aff’s can both increase non-exist property regimes in space AND decrease appropriation by private actors – makes the topic untenable.

#### b] Ground – wrecks Neg Generics – we can’t say appropriation good since the 1AC can create new views on Outer Space Property Rights that circumvent our Links since they can say “Public Trust” approach solves.

#### Independently - the Plan is both Extra-T - since it establishes a new property rights regime AND Effects-T - since the creation of new property rights regimes ISNT INTRINSICALLY a reduction on Private Property in Space, it involves actions like creating a governance system AND redistribution/cooperation which is the I/L to their advantages - both of which are voters for Limits and Predictability – independently their plan text allows them to delink out of all core generics like space mining good or bad since you can just shift the way that private property rights works

Fairness is a voting issue because debates a game and needs fair rules to evaluate it and educations a voting issue because it’s the only reason for why this activity is useful in the first place

#### 4] TVA – just defend that space appropriation is bad.

#### a] Topicality is Drop the Debater – it’s a fundamental baseline for debate-ability.

#### b] Use Competing Interps – 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.

#### c] No RVI’s - 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 not being abusive.

### 1NC – OFF

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

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

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

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

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

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

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

Until recently, China’s space activity has been overwhelmingly dominated by two state-owned enterprises: the China Aerospace Science & Industry Corporation Limited (CASIC) and the China Aerospace Science and Technology Corporation (CASC). A few private space firms have been allowed to operate in the country for a while: for example, there’s the China Great Wall Industry Corporation Limited (in reality a subsidiary of CASC), which has provided commercial launches since it was established in 1980. But for the most part, China’s commercial space industry has been nonexistent. Satellites were expensive to build and launch, and they were too heavy and large for anything but the biggest rockets to actually deliver to orbit. The costs involved were too much for anything but national budgets to handle.

That all changed this past decade as the costs of making satellites and launching rockets plunged. In 2014, a year after Xi Jinping took over as the new leader of China, the Chinese government decided to treat civil space development as a key area of innovation, as it had already begun doing with AI and solar power. It issued a policy directive called [Document 60](https://archive.md/o/bc9l4/www.cpppc.org/en/zy/994006.jhtml) that year to enable large private investment in companies interested in participating in the space industry.

“Xi’s goal was that if China has to become a critical player in technology, including in civil space and aerospace, it was critical to develop a space ecosystem that includes the private sector,” says Namrata Goswami, a geopolitics expert based in Montgomery, Alabama, who’s been studying China’s space program for many years. “He was taking a cue from the American private sector to encourage innovation from a talent pool that extended beyond state-funded organizations.”

As a result, there are now 78 commercial space companies operating in China, according to a[2019 report by the Institute for Defense Analyses](https://archive.md/o/bc9l4/https:/www.ida.org/-/media/feature/publications/e/ev/evaluation-of-chinas-commercial-space-sector/d-10873.ashx). More than half have been founded since 2014, and the vast majority focus on satellite manufacturing and launch services.

For example, Galactic Energy, founded in February 2018, is building its Ceres rocket to offer rapid launch service for single payloads, while its Pallas rocket is being built to deploy entire constellations. Rival company i-Space, formed in 2016, became the first commercial Chinese company to make it to space with its Hyperbola-1 in July 2019. It wants to pursue reusable first-stage boosters that can land vertically, like those from SpaceX. So does LinkSpace (founded in 2014), although it also hopes to use rockets to deliver packages from one terrestrial location to another.

Spacety, founded in 2016, wants to turn around customer orders to build and launch its small satellites in just six months. In December it launched a miniaturized version of a satellite that uses 2D radar images to build 3D reconstructions of terrestrial landscapes. Weeks later, it [released the first images taken by the satellite](https://archive.md/o/bc9l4/https:/spacenews.com/spacety-releases-first-sar-images/), Hisea-1, featuring three-meter resolution. Spacety wants to launch a constellation of these satellites to offer high-quality imaging at low cost.

To a large extent, China is following the same blueprint drawn up by the US: using government contracts and subsidies to give these companies a foot up. US firms like SpaceX benefited greatly from NASA contracts that paid out millions to build and test rockets and space vehicles for delivering cargo to the International Space Station. With that experience under its belt, SpaceX was able to attract more customers with greater confidence.

Venture capital is another tried-and-true route. The IDA report estimates that VC funding for Chinese space companies was up to $516 million in 2018—far shy of the $2.2 billion American companies raised, but nothing to scoff at for an industry that really only began seven years ago. At least 42 companies had no known government funding.

And much of the government support these companies do receive doesn’t have a federal origin, but a provincial one. “[These companies] are drawing high-tech development to these local communities,” says Hines. “And in return, they’re given more autonomy by the local government.” While most have headquarters in Beijing, many keep facilities in Shenzhen, Chongqing, and other areas that might draw talent from local universities.

There’s also one advantage specific to China: manufacturing. “What is the best country to trust for manufacturing needs?” asks James Zheng, the CEO of Spacety’s Luxembourg headquarters. “It’s China. It’s the manufacturing center of the world.” Zheng believes the country is in a better position than any other to take advantage of the space industry’s new need for mass production of satellites and rockets alike.

Making friends

The most critical strategic reason to encourage a private space sector is to create opportunities for international collaboration—particularly to attract customers wary of being seen to mix with the Chinese government. (US agencies and government contractors, for example, are barred from working with any groups the regime funds.) Document 60 and others issued by China’s National Development and Reform Commission were aimed not just at promoting technological innovation, but also at drawing in foreign investment and maximizing a customer base beyond Chinese borders.

“China realizes there are certain things they cannot get on their own,” says Frans von der Dunk, a space policy expert at the University of Nebraska–Lincoln. Chinese companies like LandSpace and MinoSpace have worked to accrue funding through foreign investment, escaping dependence on state subsidies. And by avoiding state funding, a company can also avoid an array of restrictions on what it can and can’t do (such as constraints on talking with the media). Foreign investment also makes it easier to compete on a global scale: you’re taking on clients around the world, launching from other countries, and bringing talent from outside China.

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

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

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

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

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

#### Xi will launch diversionary war to domestic backlash – escalates in multiple hotspots

Norris 17, William J. Geostrategic Implications of China’s Twin Economic Challenges. CFR Discussion Paper, 2017. (Associate professor of Chinese foreign and security policy at Texas A&M University’s Bush School of Government and Public Service)//Elmer

Populist pressures might tempt the **party leadership** to encourage **diversionary nationalism**. The logic of this concern is straightforward: the Communist Party might seek to **distract a restless domestic population** with **adventurism abroad**.19 The **Xi** administration wants to **appear tough** in its **defense of foreign encroachments** against China’s interests. This need stems from a long-running narrative about how a weak Qing dynasty was unable to defend China in the face of European imperial expansion, epitomized by the Opium Wars and the subsequent treaties imposed on China in the nineteenth century. The party is **particularly sensitive** to **perceptions of weakness** because much of its **claim to legitimacy**—manifested in **Xi’s Chinese Dream** campaign today—stems from the party’s claims of leading the **restoration of Chinese greatness**. For example, the May Fourth Movement, a popular protest in 1919 that helped catalyze the CPC, called into question the legitimacy of the Republic of China government running the country at that time because the regime was seen as not having effectively defended China’s territorial and sovereignty interests at the Versailles Peace Conference. **Diversionary nationalist frictions** would likely occur if the Chinese leadership portrayed a foreign adversary as having made the first move, thus forcing Xi to stand up for China’s interests. An example is the 2012 attempt by the nationalist governor of Tokyo, Shintaro Ishihara, to buy the Senkaku/Diaoyu Islands from a private owner.20 Although the Japanese central government sought to avert a crisis by stepping in to purchase the islands—having them bought and administered by Ishihara’s Tokyo metropolitan government would have dragged Japan into a confrontation with China—China saw this move as part of a deliberate orchestration by Japan to nationalize the islands. Xi seemingly had no choice but to defend China’s claims against an attempt by Japan to consolidate its position on the dispute.21 This issue touched off a period of heated tensions between China and Japan, lasting more than two years.22 Such dynamics are not limited to Japan. Other possible areas of conflict include, but are not necessarily limited to, **Taiwan**, **India**, and the **South China Sea** (especially with the **Philippines** and **Vietnam**). The Chinese government will use such tactics if it believes that the costs are relatively low. Ideally, China would like to appear tough while avoiding material repercussions or a serious diplomatic breakdown. Standing up against foreign encroachment—without facing much blowback—could provide Xi’s administration with a tempting source of noneconomic legitimacy. However, over the next few years, Xi will probably not be actively looking to get embroiled abroad. Cushioning the fallout from slower growth while managing a structural economic transition will be difficult enough. Courting potential international crises that distract the central leadership would make this task even more daunting. Even if the top leadership did not wish to provoke conflict, a smaller budgetary allotment for security could cause **military interests** in China to **deliberately instigate trouble** to **justify** their **claims over increasingly scarce resources**. For example, an air force interested in ensuring its funding for a midair tanker program might find the existence of far-flung territorial disputes to be useful in making its case. Such a case would be made even stronger by a pattern of recent frictions that highlights the necessity of greater air power projection. Budgetary pressures may be partly behind a recent People’s Liberation Army reorganization and headcount reduction. A slowing economy might cause a further deceleration in China’s military spending, thus increasing such pressures as budgetary belts tighten. Challenges to Xi’s Leadership Xi Jinping’s efforts to address economic challenges could fail, unleashing consequences that extend well beyond China’s economic health. For example, an **economic collapse** could give rise to a Vladimir **Putin–like redemption figure** in China. Xi’s approach of centralizing authority over a diverse, complex, and massive social, political, and economic system is a **recipe for brittleness**. Rather than designing a resilient, decentralized governance structure that can gracefully cope with localized failures at particular nodes in a network, a highly centralized architecture **risks catastrophic**, **system-level failure**. Although centralized authority offers the tantalizing chimera of stronger control from the center, it also puts all the responsibility squarely on Xi’s shoulders. With China’s ascension to great power status, the consequences of internecine domestic political battles are increasingly playing out on the world stage. The international significance of China’s domestic politics is a new paradigm for the Chinese leadership, and one can expect an adjustment period during which the outcome of what had previously been relatively insulated domestic political frictions will likely generate **unintended international repercussions**. Such dynamics will influence Chinese foreign policy and security behavior. Domestic arguments over ideology, bureaucratic power struggles, and strategic direction could all have **ripple effects abroad**. Many of China’s party heavyweights still employ a narrow and exclusively domestic political calculus. Such behavior increases the possibility of international implications that are not fully anticipated, **raising the risks** of **strategic miscalculation** on the world stage. For example, the factional power struggles that animated the Cultural Revolution were largely driven by domestic concerns, yet manifested themselves in Chinese foreign policy for more than a decade. During this period, China was not the world’s second largest economy and, for much of this time, did not even have formal representation at the United Nations. If today’s globally interconnected China became engulfed in similar domestic chaos, the effects would be felt worldwide.23 Weakened Fetters of Economic Interdependence If China successfully transitioned away from its export-driven growth model toward a consumption-driven economic engine over the next four or five years, it could no longer feel as constrained by economic interdependence. To the extent that such constraints are loosened, the U.S.-China relationship will be more prone to conflict and friction.24 While China has never been the archetypal liberal economic power bent on benign integration with the global economy, its export-driven growth model produced a strong strategic preference for stability. Although past behavior is not necessarily indicative of future strategic calculus, China’s “economic circuit breaker” logic seems to have held its most aggressive nationalism below the threshold of war since 1979. A China that is both comparatively strong and less dependent on the global economy would be a novel development in modern geopolitics. As China changes the composition of its international economic linkages, global integration could place fewer constraints on it. Whereas China has been highly reliant on the import of raw materials and semifinished goods for reexport, a consumption-driven China could have a different international trade profile. China could still rely on imported goods, but their centrality to the country’s overall economic growth would be altered. Imports of luxury goods, consumer products, international brands, and services may not exert a significant constraining influence, since loss of access to such items may not be seen as strategically vital. If these flows were interrupted or jeopardized, the result would be more akin to an inconvenience than a strategic setback for China’s rise. That said, China is likely to continue to highly depend on imported oil even if the economic end to which that energy resource is directed shifts away from industrial and export production toward domestic consumption.

#### **US–China war goes nuclear – crisis mis-management ensures conventional escalation - extinction**

Kulacki 20 [Dr. Gregory Kulacki focuses on cross-cultural communication between the United States and China on nuclear and space arms control and is the China Project Manager for the Global Security Program at the Union of Concerned Scientists, 2020. Would China Use Nuclear Weapons First In A War With The United States?, Thediplomat.com, https://thediplomat.com/2020/04/would-china-use-nuclear-weapons-first-in-a-war-with-the-united-states/] srey

Admiral Charles A. Richard, the head of the U.S. Strategic Command, recently told the Senate Armed Service Committee he “could drive a truck” through the holes in China’s no first use policy. But when Senator John Hawley (R-MO) asked him why he said that, Commander Richard backtracked, described China’s policy as “very opaque” and said his assessment was based on “very little” information. That’s surprising. **China** has been exceptionally **clear** **about** its **intentions** **on** the possible **first** **use** **of** **nuclear** **weapons**. On the day of its first nuclear test on October 16, 1964, China declared it “will never at any time or under any circumstances be the first to use nuclear weapons.” That **unambiguous** **statement** **has** **been** a **cornerstone** **of** **Chinese** **nuclear** **weapons** policy for 56 years and has been repeated frequently in authoritative Chinese publications for domestic and international audiences, including a highly classified training manual for the operators of China’s nuclear forces. Richard should know about those publications, particularly the training manual. A U.S. Department of Defense translation has been circulating within the U.S. nuclear weapons policy community for more than a decade. The commander’s comments to the committee indicate a familiarity with the most controversial section of the manual, which, in the eyes of some U.S. analysts, indicates there may be some circumstances where **China** **would** **use** **nuclear** **weapons** **first** **in** a **war** **with** **the** **U**nited **S**tates. This U.S. misperception is understandable, especially given the difficulties the Defense Department encountered translating the text into English. The language, carefully considered in the context of the entire book, articulates a strong reaffirmation of China’s no first use policy. But it also reveals **Chinese** military planners are **struggling** **with** **crisis** **management** **and** **considering** **steps** **that** could **create** **ambiguity** **with** **disastrous** **consequences**. Towards the end of the 405-page text on the operations of China’s strategic rocket forces, in a chapter entitled, “Second Artillery Deterrence Operations,” the authors explain what China’s nuclear forces train to do if **“**a strong military power possessing nuclear‐armed missiles and an absolute advantage in high‐tech conventional weapons is carrying out intense and continuous attacks against our major strategic targets and we have no good military strategy to resist the enemy.**”** The military power they’re talking about is the United States. The authors indicate China’s nuclear missile forces train to take specific steps, including increasing readiness and conducting launch exercises, to “dissuade the continuation of the strong enemy’s conventional attacks.” The manual refers to these steps as an “adjustment” to China’s nuclear policy and a “lowering” of China’s threshold for brandishing its nuclear forces. Chinese leaders would only take these steps in extreme circumstances. The text highlights several triggers such as U.S. conventional bombing of China’s nuclear and hydroelectric power plants, heavy conventional bombing of large cities like Beijing and Shanghai, or other acts of **conventional** **warfare** **that** “**seriously** **threatened**” the “safety and **survival**” of the nation. U.S. Misunderstanding Richard seems to believe this planned adjustment in China’s nuclear posture means China is **preparing** **to** **use** **nuclear** **weapons** first under these circumstances. He told Hawley that there are a “number of situations where they may conclude that first use has occurred that do not meet our definition of first use.” The head of the U.S. Strategic Command appears to assume, as do other U.S. analysts, that the **Chinese** would **interpret** **these** types of U.S. conventional **attacks** **as** **equivalent** **to** a **U.S. first use** **of** **nuclear** **weapons** against China. But that’s not what the text says. “Lowering the threshold” refers to China putting its nuclear weapons on alert — it does not indicate Chinese leaders might lower their threshold for deciding to use nuclear weapons in a crisis. Nor does the text indicate Chinese nuclear forces are training to launch nuclear weapons first in a war with the United States. China, unlike the United States, keeps its nuclear forces off-alert. Its warheads are not mated to its missiles. China’s nuclear-armed submarines are not continuously at sea on armed patrols. The manual describes how China’s nuclear warheads and the missiles that deliver them are controlled by two separate chains of command. Chinese missileers train to bring them together and launch them after China has been attacked with nuclear weapons. All of these behaviors are consistent with a no first use policy. The “adjustment” Chinese nuclear forces are preparing to make if the United States is bombing China with impunity is to place China’s nuclear forces in a state of readiness similar to the state the nuclear forces of the United States are in all the time. This step is intended not only to end the bombing, but also to convince U.S. decision-makers they cannot expect to destroy China’s nuclear retaliatory capability if the crisis escalates. Chinese Miscalculation Unfortunately, alerting Chinese nuclear forces at such a moment could have terrifying consequences. Given the relatively small size of China’s nuclear force, a U.S. president might be tempted to try to limit the possible damage from a Chinese nuclear attack by destroying as many of China’s nuclear weapons as possible before they’re launched, especially if the head of the U.S. Strategic Command told the president China was preparing to strike first. One study concluded that if the United States used nuclear weapons to attempt to knock out a small fraction of the Chinese ICBMs that could reach the United States it may kill tens of millions of Chinese civilians. The authors of the text assume alerting China’s nuclear forces would “create a great shock in the enemy’s psyche.” That’s a fair assumption. But they also assume this shock could “dissuade the continuation of the strong enemy’s conventional attacks against our major strategic targets.” That’s highly questionable. There is a **substantial** **risk** **the** **U**nited **S**tates **would** **respond** **to** this implicit **Chinese** **threat** **to** **use** **nuclear** **weapons** **by** **escalating**, rather than halting, its **conventional** **attacks**. If China’s nuclear forces were targeted, it would put even greater strain on the operators of China’s nuclear forces. A **slippery** **slope** **to** **nuclear** **war** Chinese military planners are aware that attempting to coerce the United States into halting conventional bombardment by alerting their nuclear forces could fail. They also know it might trigger a nuclear war. But if it does, they are equally clear China won’t be the one to start it. Nuclear attack is often preceded by nuclear coercion. Because of this, in the midst of the process of a high, strong degree of nuclear coercion we should prepare well for a nuclear retaliatory attack. The more complete the preparation, the higher the credibility of nuclear coercion, the easier it is to accomplish the objective of nuclear coercion, and the lower the possibility that the nuclear missile forces will be used in actual fighting. They assume if China demonstrates it is well prepared to retaliate the United States would not risk a damage limitation strike using nuclear weapons. And even if the United States were to attack China’s nuclear forces with conventional weapons, China still would not strike first. In the opening section of the next chapter on “nuclear retaliatory attack operations” the manual instructs, as it does on numerous occasions throughout the entire text: According to our country’s principle, its stand of no first use of nuclear weapons, the Second Artillery will carry out a nuclear missile attack against the enemy’s important strategic targets, according to the combat orders of the Supreme Command, only after the enemy has carried out a nuclear attack against our country. Richard is wrong. There are no holes in China’s no first use policy. But the worse-case planning articulated in this highly classified military text is a significant and deeply troubling departure from China’s traditional thinking about the role of nuclear weapons. Mao Zedong famously called nuclear weapons “a paper tiger.” Many assumed he was being cavalier about the consequences of nuclear war. But what he meant is that they would not be used to fight and win wars. U.S. nuclear threats during the Korean War and the Taiwan Strait Crisis in the 1950s – threats not followed by an actual nuclear attack – validated Mao’s intuition that nuclear weapons were primarily psychological weapons. Chinese leaders decided to acquire nuclear weapons to free their minds from what Mao’s generation called “**nuclear** **blackmail**.” A former director of China’s nuclear weapons laboratories told me China developed them so its leaders could “sit up with a straight spine.” Countering nuclear blackmail – along with compelling other nuclear weapons states to negotiate their elimination – were the only two purposes Chinese nuclear weapons were meant to serve. Contemporary Chinese military planners appear to have added a new purpose: compelling the United States to halt a conventional attack. Even though it only applies in extreme circumstances, it **increases** the **risk** **that** a **war** between the United States and China **will** **end** **in** a nuclear exchange with unpredictable and **catastrophic** **consequences**. Adding this new purpose could also be the first step on a slippery slope to an incremental broadening the role of nuclear weapons in Chinese national security policy. Americans would be a lot safer if we could avoid that. The United States government should applaud China’s no first use policy instead of repeatedly calling it into question. And it would be wise to adopt the same policy for the United States. If both countries declared they would never use nuclear weapons first it may not guarantee they can avoid a nuclear exchange during a military crisis, but it would make one far less likely.

## Case

### 1NC – AT: Advantage 1

#### No Extinction from Warming – new studies prove over-hype and tech solves.

* Extinction Tipping Point is implausible – we’re on track for 3 degrees, not 4-5 degrees
* Tech and Energy Modernization Solve – Renewable Energy is replacing Fossil Fuels which reduces Climate Mortality by a rate of 5.

Nordhaus 20 Ted Nordhaus 1-23-2020 “Ignore the Fake Climate Debate” <https://www.wsj.com/articles/ignore-the-fake-climate-debate-11579795816>, found by BPS, (American author, environmental policy expert, and the director of research at The Breakthrough Institute, citing new climate change forecasts)//Re-cut by Elmer

Beyond the headlines and social media, where Greta Thunberg, Donald Trump and the online armies of climate “alarmists” and “deniers” do battle, there is a real climate debate bubbling along in scientific journals, conferences and, occasionally, even in the halls of Congress. It gets a lot less attention than the boisterous and fake debate that dominates our public discourse, but it is much more relevant to how the world might actually address the problem. In the real climate debate, no one denies the relationship between human emissions of greenhouse gases and a warming climate. Instead, the disagreement comes down to different views of climate risk in the face of multiple, cascading uncertainties. On one side of the debate are optimists, who believe that, with improving technology and greater affluence, our societies will prove quite adaptable to a changing climate. On the other side are pessimists, who are more concerned about the risks associated with rapid, large-scale and poorly understood transformations of the climate system. But most pessimists do not believe that runaway climate change or a hothouse earth **are plausible** scenarios, much less that human extinction is imminent. And most optimists recognize a need for policies to address climate change, even if they don’t support the radical measures that Ms. Thunberg and others have demanded. In the fake climate debate, both sides agree that economic growth and reduced emissions vary inversely; it’s a zero-sum game. In the real debate, the relationship is much more complicated. Long-term economic growth is associated with both rising per capita energy consumption and slower population growth. For this reason, as the world continues to get richer, higher per capita energy consumption is likely to be offset by a lower population. A richer world will also likely be more technologically advanced, which means that energy consumption should be less carbon-intensive than it would be in a poorer, less technologically advanced future. In fact, a number of the high-emissions scenarios produced by the United Nations Intergovernmental Panel on Climate Change involve futures in which the world is relatively poor and populous and less technologically advanced. Affluent, developed societies are also much better equipped to respond to climate extremes and natural disasters. That’s why natural disasters kill and displace many more people in poor societies than in rich ones. It’s not just seawalls and flood channels that make us resilient; it’s air conditioning and refrigeration, modern transportation and communications networks, early warning systems, first responders and public health bureaucracies. New research published in the journal Global Environmental Change finds that global economic growth over the last decade has reduced climate mortality by a factor of five, with the **greatest benefits documented in the poorest nations.** In low-lying Bangladesh, 300,000 people died in Cyclone Bhola in 1970, when 80% of the population lived in extreme poverty. In 2019, with less than 20% of the population living in extreme poverty, Cyclone Fani killed just five people. “Poor nations are most vulnerable to a changing climate. The fastest way to reduce that vulnerability is through economic development.” So while it is true that poor nations are most vulnerable to a changing climate, it is also true that the fastest way to reduce that vulnerability is through economic development, which requires infrastructure and industrialization. Those activities, in turn, require cement, steel, process heat and chemical inputs, all of which are impossible to produce today without fossil fuels. For this and other reasons, the world is unlikely to cut emissions fast enough to stabilize global temperatures at less than 2 degrees above pre-industrial levels, the long-standing international target, much less 1.5 degrees, as many activists now demand. But recent forecasts also suggest that many of the worst-case climate scenarios produced in the last decade, which assumed unbounded economic growth and fossil-fuel development, are also very unlikely. There is still substantial uncertainty about how sensitive global temperatures will be to higher emissions over the long-term. But the best estimates now suggest that the world is on track for 3 degrees of warming by the end of this century, not 4 or 5 degrees as was once feared. That is due in part to slower economic growth in the wake of the global financial crisis, but also to decades of technology policy and energy-modernization efforts. “We have better and cleaner technologies available today because policy-makers in the U.S. and elsewhere set out to develop those technologies.” The energy intensity of the global economy continues to fall. **Lower-carbon natural gas has displaced coal as the primary source of new fossil energy**. The **falling cost of wind and solar energy** has begun to have an effect on the growth of fossil fuels. Even **nuclear energy** has made a modest comeback in Asia.

#### [Aff] studies about CO2 impact are exaggerated

* peer-reviewed journal shows IPCC exaggeration
* history proves resilience
* no extinction- warming under Paris goals
* rock breaking strategy could offset warming

IBD 18 Investors Business Daily 4-25-2018 “Here's One Global Warming Study Nobody Wants You To See” <https://www.investors.com/politics/editorials/global-warming-computer-models-co2-emissions/> (Citing Study from Peer reviewed journal by Lewis and Curry)//Re-cut by Elmer

Settled Science: A new study published in a peer-reviewed journal finds that climate models exaggerate the global **warming from CO2** emissions by as much as 45%. If these findings hold true, it's huge news. No wonder the mainstream press is ignoring it. In the study, authors Nic Lewis and Judith Curry looked at actual temperature records and compared them with climate change computer models. What they found is that the planet has shown itself to be far less sensitive to increases in CO2 than the climate models say. As a result, they say, the planet will warm less than the models predict, even if we continue pumping CO2 into the atmosphere. As Lewis explains: "Our results imply that, for any future emissions scenario, future warming is likely to be substantially lower than the central computer model-simulated level projected by the (United Nations Intergovernmental Panel on Climate Change), and highly unlikely to exceed that level. How much lower? Lewis and Curry say that their findings show temperature increases will be 30%-45% lower than the climate models say. If they are right, then there's little to worry about, even if we don't drastically reduce CO2 emissions. The planet will warm from human activity, but not nearly enough to cause the sort of end-of-the-world calamities we keep hearing about. In fact, the resulting warming would be below the target set at the Paris agreement. This would be tremendously good news. The fact that the Lewis and Curry study appears in the peer-reviewed American Meteorological Society's Journal of Climate lends credibility to their findings. This is the same journal, after all, that recently published widely covered studies saying the Sahara has been growing and the climate boundary in central U.S. has shifted 140 miles to the east because of global warming. The Lewis and Curry findings come after another study, published in the prestigious journal Nature, that found the long-held view that a doubling of CO2 would boost global temperatures as much as 4.5 degrees Celsius was wrong**.** The most temperatures would likely climb is 3.4 degrees. It also follows a study published in Science, which found that **rocks** contain vast amounts of nitrogen that plants could use to grow and absorb more CO2, potentially **offsetting** at least some of the effects of CO2 emissions and reducing future temperature increases.

#### Variations natural and CO2 effects are overstated.

* 10,000 years prove natural range of warming
* No Co2 effect on Warming – No Net Warming despite 8 Percent increase of Co2
* Solar Radiation has net greater effect – close correlation over past 150 years

Carter et al. 15 Robert M Carter 4-12-2015 “Why Scientists Disagree About Global Warming The NIPCC Report on Scientific Consensus” (Craig D. Idso, Ph.D. Robert M. Carter, Ph.D. S. Fred Singer, Ph. D. Chairman Emeritus Fellow Chairman Center for the Study Institute of Public Affairs Science and of Carbon Dioxide Australia) Environmental Policy and Global Change Project (USA) (USA))//Elmer

Modern Warming Is Not Unprecedented IPCC’s second false postulate is that the late twentieth century warm peak was of greater magnitude than previous natural peaks. Comparison of modern and ancient rates of natural temperature change is difficult because of the lack of direct measurements available prior to 1850. However, high-quality proxy temperature records from the Greenland ice core for the past 10,000 years demonstrate a **natural range of warming** and cooling rates between +2.5 and -2.5 °C/century (Alley, 2000; Carter, 2010, p. 46, figure7), significantly greater than rates measured for Greenland or the globe during the twentieth century. Glaciological and recent geological records contain numerous examples of ancient temperatures up to 3°C or more warmer than the peak reported at the end of the twentieth century. During the Holocene, such warmer peaks included the Egyptian, Minoan, Roman, and Medieval warm periods (Alley, 2000). During the Pleistocene, warmer peaks were associated with interglacial oxygen isotope stages 5, 9, 11, and 31 (Lisiecki and Raymo, 2005). During the Late Miocene and Early Pliocene (6–3 million years ago) temperature consistently attained values 2–3°C above twentieth century values (Zachos et al., 2001). Figure 10 summarizes these and other findings about surface temperatures that appear in Chapter 4 of Climate Change Reconsidered-II: Physical Science. Figure 10 Key Facts about Surface Temperature # Whether today’s global surface temperature is seen to be part of a warming trend depends upon the time period considered. # Over (climatic) time scales of many thousand years, temperature is cooling; over the historical (meteorological) time scale of the past century temperature has warmed. Over the past 18 years, there has been no net warming despite an increase in atmospheric CO2 of 8 percent – which represents 34 percent of all human-related CO2 emissions released to the atmosphere since the industrial revolution. # Given an atmospheric mixing time of ~1 year, the facts just related represent a test of the dangerous warming hypothesis, which test it fails. # Based upon the HadCRUT dataset favored by IPCC, two phases of warming occurred during the twentieth century, between 1910–1940 and 1979–2000, at similar rates of a little over 1.5°C/century. The early twentieth century warming preceded major industrial carbon dioxide emissions and must be natural; warming during the second (prima facie, similar) period might incorporate a small human-related carbon dioxide effect, but warming might also be inflated by urban heat island effects. # Other temperature datasets fail to record the late twentieth century warming seen in the HadCRUT dataset. # There was nothing unusual about either the magnitude or rate of the late twentieth century warming pulses represented on the HadCRUT record, both falling well within the envelope of known, previous natural variations. # No empirical evidence exists to support the assertion that a planetary warming of 2°C would be net ecologically or economically damaging. Source: “Chapter 4. Observations: Temperatures,” Climate Change Reconsidered II: Physical Science (Chicago, IL: The Heartland Institute, 2013). **CO2 Does Not Lead Temperature** IPCC’s third false postulate is that increases in atmospheric CO2 precede, and then force, parallel increases in temperature. The remarkable (and at first blush, synchronous) parallelism that exists between rhythmic fluctuations in ancient atmospheric temperature and atmospheric CO2 levels was first detected in polar ice core samples analyzed during the 1970s. From the early 1990s onward, however, higher-resolution sampling has repeatedly shown these historic temperature changes precede the parallel changes in CO2 by several hundred years or more (Mudelsee, 2001; Monnin et al., 2001; Caillon et al., 2003; Siegenthaler et al., 2005). A similar relationship of temperature change leading CO2 change (in this case by several months) also characterizes the much shorter seasonal cyclicity manifest in Hawaiian and other meteorological measurements (Kuo et al., 1990). In such circumstances, changing levels of CO2 cannot be driving changes in temperature, but must either be themselves stimulated by temperature change, or be co-varying with temperature in response to changes in another (at this stage unknown) variable. Solar Influence Is Not Minimal IPCC’s fourth false postulate is that solar forcings are too small to explain twentieth century warming. Having concluded solar forcing alone is inadequate to account for twentieth century warming, IPCC authors infer CO2 must be responsible for the remainder. Nonetheless, observations indicate variations occur in total ocean–atmospheric meridional heat transport and that these variations are driven by changes in solar radiation rooted in the intrinsic variability of the Sun’s magnetic activity (Soon and Legates, 2013). Incoming solar radiation is most often expressed as Total Solar Insolation (TSI), a measure derived from multi-proxy measures of solar activity (Hoyt and Schatten, 1993; extended and re-scaled by Willson, 2011; Scafetta and Willson, 2013). The newest estimates, from satellite-borne ACRIM-3 measurements, indicate TSI ranged between 1360 and 1363 Wm-2 between 1979 and 2011, the variability of ~3 Wm-2 occurring in parallel with the 11-year sunspot cycle. Larger changes in TSI are also known to occur in parallel with climatic change over longer time scales. For instance, Shapiro et al. (2011) estimated the TSI change between the Maunder Minimum and current conditions may have been as large as 6 Wm-2. Temperature records from circum-Arctic regions of the Northern Hemisphere show a close correlation with TSI over the past 150 years, with both measures conforming to the ~60–70 year multidecadal cycle. In contrast, the measured steady rise of CO2 emissions over the same period shows little correlation with the strong multidecadal (and shorter) ups and downs of surface temperature around the world. Finally, **IPCC ignores x-ray, ultraviolet, and magnetic flux variation, the latter having particularly important implications for the modulation of galactic cosmic ray influx and low cloud formation** (Svensmark, 1998; Kirkby, et al., 2011). Figure 11 summarizes these and other findings about solar forcings from Chapter 3 of Climate Change Reconsidered II: Physical Science.Figure 11 Key Facts about Solar Forcing # Evidence is accruing that changes in Earth’s surface temperature are largely driven by variations in solar activity. Examples of solar-controlled climate change epochs include the Medieval Warm Period, Little Ice Age, and Early Twentieth Century (1910–1940) Warm Period. # The Sun may have contributed as much as 66 percent of the observed twentieth century warming, and perhaps more. # Strong empirical correlations have been reported from around the world between solar variability and climate indices including temperature, precipitation, droughts, floods, streamflow, and monsoons. # IPCC models do not incorporate important solar factors such as fluctuations in magnetic intensity and overestimate the role of human-related CO2 forcing. # IPCC fails to consider the importance of the demonstrated empirical relationship between solar activity, the ingress of galactic cosmic rays, and the formation of low clouds. # The respective importance of the Sun and CO2 in forcing Earth’s climate remains unresolved; current climate models fail to account for a plethora of known Sun-climate connections. # The recently quiet Sun and extrapolation of solar cycle patterns into the future suggest a planetary cooling may occur over the next few decades. Source: “Chapter 3. Solar Forcing of Climate,” Climate Change Reconsidered II: Physical Science (Chicago, IL: The Heartland Institute, 2013). Warming Would Not Be Harmful IPCC’s fifth false postulate is that warming of 2°C above today’s temperature would be harmful. The suggestion that 2°C of warming would be harmful was coined at a conference organized by the British Meteorological Office in 2005 (DEFRA, 2005). The particular value of 2°C is entirely arbitrary and was proposed by the World Wildlife Fund, an environmental advocacy group, as a political expediency rather than as an informed scientific opinion. The target was set in response to concern that politicians would not initiate policy actions to reduce CO2 emissions unless they were given a specific (and low) quantitative temperature target to aim for. Multiple lines of evidence suggest a 2°C rise in temperature would not be harmful to the biosphere. The period termed the Holocene Climatic Optimum (c. 8,000 ybp) was 2–3°C warmer than today (Alley, 2000), and the planet attained similar temperatures for several million years during the Miocene and Pliocene (Zachos et al., 2001). Biodiversity is encouraged by warmer rather than colder temperatures (Idso and Idso, 2009), and higher temperatures and elevated CO2 greatly stimulate the growth of most plants (Idso and Idso, 2011). Despite its widespread adoption by environmental NGOs, lobbyists, and governments, no empirical evidence exists to substantiate the claim that 2°C of warming presents a threat to planetary ecologies or human well-being. Nor can any convincing case be made that a warming will be more economically costly than an equivalent cooling (either of which could occur for natural reasons), since any planetary change of 2°C magnitude in temperature would result in complex local and regional changes, some being of economic or environmental benefit and others being harmful. \* \* \* We conclude neither the rate nor the magnitude of the reported late twentieth century surface warming (1979–2000) lay outside normal natural variability, nor was it in any way unusual compared to earlier episodes in Earth’s climatic history. Furthermore, solar forcings of temperature change are likely more important than is currently recognized, and evidence is lacking that a 2°C increase in temperature (of whatever cause) would be globally harmful.

#### CO2 is key to agriculture – stops extinction

Ferrera 14 Peter Ferrera 2-24-2014 “The Period Of No Global Warming Will Soon Be Longer Than the Period of Actual Global Warming” <http://www.forbes.com/sites/peterferrara/2014/02/24/the-period-of-no-global-warming-will-soon-be-longer-than-the-period-of-actual-global-warming/#42cc9ebf8bf0> (J.D. Harvard Law, contributor to Forbes on climate and public policy, Director of Entitlement and Budget Policy for the Heartland Institute, Senior Advisor for Entitlement Reform and Budget Policy at the National Tax Limitation Foundation, General Counsel for the American Civil Rights Union, and Senior Fellow at the National Center for Policy Analysis, served in the White House Office of Policy Development under President Reagan, and as Associate Deputy Attorney General of the United States under President George H.W. Bush)//Elmer

In addition, CO2 is actually essential to all life on the planet. Plants need CO2 to grow and conduct photosynthesis, which is the natural process that creates **food for animals and fish** at the bottom of the food chain. The increase of CO2 in the atmosphere that has occurred due to human emissions has actually increased agricultural growth and output as a result, causing actually an increased greening of the planet. So has any warming caused by such human emissions, as minor warming increases agricultural growth. The report states, “CO2 is a vital nutrient used by plants in photosynthesis. Increasing CO2 in the atmosphere ‘greens’ the planet and helps feed the growing human population.”

#### Best studies prove

Ballonoff 14, Paul. "A fresh look at climate change." Cato J. 34 (2014): 113. (consultant, international energy development)//Elmer

While in fact heating has not occurred as the IPCC forecasted, greatly increased global biomass is indeed demonstrated. Well documented evidence shows that concurrently with the **increased CO2** levels, extensive, large, and continuing increase in **biomass is taking place globally**—reducing deserts, turning grasslands to savannas, savannas to forests, and expanding existing forests (Idso 2012). That survey covered 400 peer-reviewed empirical studies, many of which included surveys of dozens to hundreds of sources. Comprehensive study of global and regional relative greening and browning using NOAA data showed that shorter-term trends in specific locations may reflect either greening or browning, and also noted that the rapid pace of greening of the Sahel is due in part to the end of the drought in that region. Nevertheless, in nearly all regions and globally, the overall effect in recent decades is **decidedly toward greening** (de Jong et al. 2012). This result is also the opposite of what the IPCC expected.

#### Food Shortages cause Extinction and outweigh

Cribb 10, Julian. The coming famine. University of California Press, 2010. (principal of JCA, fellow of the Australian Academy of Technological Sciences and Engineering)//Elmer

The character of human conflict has also changed: since the early 1990S, **more wars have been triggered by disputes over food,** land, and water than over mere political or ethnic differences. This should not surprise US: people have fought over the means of survival for most of history. But in the abbreviated reports on the nightly media, and even in the rarefied realms of government policy, the focus is almost invariably on the players—the warring national, ethnic, or religious factions—rather than on the play, the deeper subplots building the tensions that ignite conflict. Caught up in these are groups of ordinary, desperate people fearful that there is no longer sufficient food, land, and water to feed their children—and believing that they must fight ‘the others” to secure them. At the same time, the number of refugees in the world doubled, many of them escaping from conflicts and famines precipitated by food and resource shortages. Governments in troubled regions tottered and fell. The coming famine is **planetary** because it involves both the immediate effects of hunger on directly affected populations in heavily populated regions of the world in the next forty years—and also the impacts of war, government failure, refugee crises, shortages, and food price spikes that will affect all human beings, no matter who they are or where they live. It is an emergency because unless it is solved, **billions will experience great hardship**, and not only in the poorer regions. Mike Murphy, one of the world’s most progressive dairy farmers, with operations in Ireland, New Zealand, and North and South America, succinctly summed it all up: “Global warming gets all the publicity but the real imminent threat to the human race **is starvation** on a massive scale. Taking a 10—30 year view, I believe that food shortages, famine and huge social unrest are probably the greatest threat the human race has ever faced. I believe future food shortages are a far bigger world threat than global warming.”2° The coming famine is also complex, because it is driven not by one or two, or even a half dozen, **factors but rather by the confluence of many large and profoundly intractable causes that tend to amplify one another**. This means that it cannot easily be **remedied by “silver bullets”** **in the form of technology, subsidies, or single-country policy changes**, because of the synergetic character of the things that power it.

#### Deaths from cold outweigh heat.

Ridley 13 (Matt, Climate Journalist. “Why Climate Change is Good for the World” October 19th 2013, <http://www.spectator.co.uk/2013/10/carry-on-warming/)>

Climate change has done more good than harm so far and is likely to continue doing so for most of this century. This is not some barmy, right-wing fantasy; it is the consensus of expert opinion. Yet almost nobody seems to know this. Whenever I make the point in public, I am told by those who are paid to insult anybody who departs from climate alarm that I have got it embarrassingly wrong, don’t know what I am talking about, must be referring to Britain only, rather than the world as a whole, and so forth. At first, I thought this was just their usual bluster. But then I realised that they are genuinely unaware. Good news is no news, which is why the mainstream media largely ignores all studies showing net benefits of climate change. And academics have not exactly been keen to push such analysis forward. So here follows, for possibly the first time in history, an entire article in the national press on the net benefits of climate change. There are many likely effects of climate change: positive and negative, economic and ecological, humanitarian and financial. And **if you aggregate them all, the overall effect is positive today — and likely to stay positive until around 2080**. That was the conclusion of Professor Richard Tol of Sussex University **after he reviewed 14 different studies of the effects of future climate trends**. To be precise, Prof Tol calculated that climate change would be beneficial up to 2.2˚C of warming from 2009 (when he wrote his paper). This means approximately 3˚C from pre-industrial levels, since about 0.8˚C of warming has happened in the last 150 years. The latest estimates of climate sensitivity suggest that such temperatures may not be reached till the end of the century — if at all. The Intergovernmental Panel on Climate Change, whose reports define the consensis, is sticking to older assumptions, however, which would mean net benefits till about 2080. Either way, it’s a long way off. Now Prof Tol has a new paper, published as a chapter in a new book, called *How Much have Global Problems Cost the World?*, which is edited by Bjorn Lomborg, director of the Copenhagen Consensus Centre, and was reviewed by a group of leading economists. In this paper he casts his gaze backwards to the last century. He concludes that climate change did indeed raise human and planetary welfare during the 20th century. You can choose not to believe the studies Prof Tol has collated. Or you can say the net benefit is small (which it is), you can argue that the benefits have accrued more to rich countries than poor countries (which is true) or you can emphasise that after 2080 climate change would probably do net harm to the world (which may also be true). You can even say you do not trust the models involved (though they have proved more reliable than the temperature models). But what you cannot do is deny that this is the current consensus. If you wish to accept the consensus on temperature models, then you should accept the consensus on economic benefit. Overall, Prof Tol finds that **climate change in the past century improved human welfar**e. By how much? He calculates **by 1.4 per** cent of global economic output, rising to 1.5 per cent by 2025. For some people, this means the **difference between survival and starvation**. It will still be 1.2 per cent around 2050 and will not turn negative until around 2080. In short, my children will be very old before global warming stops benefiting the world. Note that if the world continues to grow at 3 per cent a year, then the average person will be about nine times as rich in 2080 as she is today. So low-lying Bangladesh will be able to afford the same kind of flood defences that the Dutch have today. The chief benefits of global warming include: **fewer winter deaths**; **lower energy costs**; **better ag**ricultural yields; probably **fewer droughts**; maybe **richer biodiversity**. It is a little-known fact that winter deaths exceed summer deaths — not just in countries like Britain but also those with very warm summers, including Greece. Both Britain and Greece see mortality rates rise by 18 per cent each winter. Especially cold winters cause a rise in heart failures far greater than the rise in deaths during heatwaves. **Cold, not the heat, is the biggest killer**. For the last decade, Brits have been dying from the cold at the average rate of 29,000 excess deaths each winter. Compare this to the heatwave ten years ago, which claimed 15,000 lives in France and just 2,000 in Britain. In the ten years since, there has been no summer death spike at all. Excess winter deaths hit the poor harder than the rich for the obvious reason: they cannot afford heating. And it is not just those at risk who benefit from moderate warming. Global warming has so far cut heating bills more than it has raised cooling bills. If it resumes after its current 17-year hiatus, and if the energy efficiency of our homes improves, then at some point the cost of cooling probably will exceed the cost of heating — probably from about 2035, Prof Tol estimates. The greatest benefit from climate change comes not from temperature change but from carbon dioxide itself. It is not pollution, but the raw material from which plants make carbohydrates and thence proteins and fats. As it is an extremely rare trace gas in the air — less than 0.04 per cent of the air on average — plants struggle to absorb enough of it. On a windless, sunny day, a field of corn can suck half the carbon dioxide out of the air. Commercial greenhouse operators therefore pump carbon dioxide into their greenhouses to raise plant growth rates. The increase in average carbon dioxide levels over the past century, from 0.03 per cent to 0.04 per cent of the air, has had a measurable impact on plant growth rates. It is responsible for a startling change in the amount of greenery on the planet. As Dr Ranga Myneni of Boston University has documented, using three decades of satellite data, 31 per cent of the global vegetated area of the planet has become greener and just 3 per cent has become less green. This translates into a 14 per cent increase in productivity of ecosystems and has been observed in all vegetation types. Dr Randall Donohue and colleagues of the CSIRO Land and Water department in Australia also analysed satellite data and found greening to be clearly attributable in part to the carbon dioxide fertilisation effect. Greening is especially pronounced in dry areas like the Sahel region of Africa, where satellites show a big increase in green vegetation since the 1970s. It is often argued that global warming will hurt the world’s poorest hardest. What is seldom heard is that the decline of famines in the Sahel in recent years is partly due to more rainfall caused by moderate warming and partly due to more carbon dioxide itself: more greenery for goats to eat means more greenery left over for gazelles, so entire ecosystems have benefited. Even polar bears are thriving so far, though this is mainly because of the cessation of hunting. None the less, it’s worth noting that the three years with the lowest polar bear cub survival in the western Hudson Bay (1974, 1984 and 1992) were the years when the sea ice was too thick for ringed seals to appear in good numbers in spring. Bears need broken ice. Well yes, you may argue, but what about all the weather disasters caused by climate change? Entirely mythical — so far. The latest IPCC report is admirably frank about this, reporting ‘no significant observed trends in global tropical cyclone frequency over the past century … lack of evidence and thus low confidence regarding the sign of trend in the magnitude and/or frequency offloads on a global scale … low confidence in observed trends in small-scale severe weather phenomena such as hail and thunderstorms’. In fact, the death rate from droughts, floods and storms has dropped by 98 per cent since the 1920s, according to a careful study by the independent scholar Indur Goklany. Not because weather has become less dangerous but because people have gained better protection as they got richer: witness the remarkable success of cyclone warnings in India last week. That’s the thing about climate change — we will probably pocket the benefits and mitigate at least some of the harm by adapting. For example, experts now agree that malaria will continue its rapid worldwide decline whatever the climate does. Yet cherry-picking the bad news remains rife. A remarkable example of this was the IPCC’s last report in 2007, which said that global warming would cause ‘hundreds of millions of people [to be] exposed to increased water stress’ under four different scenarios of future warming. It cited a study, which had also counted numbers of people at reduced risk of water stress — and in each case that number was higher. The IPCC simply omitted the positive numbers. Why does this matter? Even if climate change does produce slightly more welfare for the next 70 years, why take the risk that it will do great harm thereafter? There is one obvious reason: climate policy is already doing harm. Building wind turbines, growing biofuels and substituting wood for coal in power stations — all policies designed explicitly to fight climate change — have had negligible effects on carbon dioxide emissions. But they have driven people into fuel poverty, made industries uncompetitive, driven up food prices, accelerated the destruction of forests, killed rare birds of prey, and divided communities. To name just some of the effects. Mr Goklany estimates that globally nearly 200,000 people are dying every year, because we are turning 5 per cent of the world’s grain crop into motor fuel instead of food: that pushes people into malnutrition and death. In this country, 65 people a day are dying **because they cannot afford to heat their homes properly**, according to Christine Liddell of the University of Ulster, yet the government is planning to double the cost of electricity to consumers by 2030. As Bjorn Lomborg has pointed out, the European Union will pay £165 billion for its current climate policies each and every year for the next 87 years. Britain’s climate policies — subsidising windmills, wood-burners, anaerobic digesters, electric vehicles and all the rest — is due to cost us £1.8 trillion over the course of this century. In exchange for that Brobdingnagian sum, we hope to lower the air temperature by about 0.005˚C — which will be undetectable by normal thermometers. The accepted consensus among economists is that every £100 spent fighting climate change brings £3 of benefit. So we are doing real harm now to impede a change that will produce net benefits for 70 years. That’s like having radiotherapy because you are feeling too well. I just don’t share the certainty of so many in the green establishment that it’s worth it. It may be, but it may not.

#### Ag Solves – Plants act as carbon sinks which offsets Warming

Harris and Gibbs 21 Nancy Harris and David Gibbs 1-21-2021 "Forests Absorb Twice As Much Carbon As They Emit Each Year" <https://www.wri.org/insights/forests-absorb-twice-much-carbon-they-emit-each-year> (Nancy is Research Manager for Global Forest Watch (GFW) within the Food, Forests and Water program. GFW is an international initiative originated by WRI to provide improved data and information about the world’s forests by merging the latest technology with on-the-ground partnerships. Nancy works to identify thematic and geographic research priorities for GFW and leads the acquisition and generation of new data and analytical content. She also supports in-country capacity building efforts and collaborates with GFW staff and partners to produce and communicate original, policy-relevant research that further advances global understanding of critical drivers and dynamics of forest change. Prior to joining WRI, Nancy worked as a Carbon and Land Use Specialist in the Ecosystem Services unit of Winrock International, where she managed Winrock’s spatial analysis team, published several peer-reviewed papers on forest carbon cycling and spatial modeling of land cover change, and provided technical guidance to multiple stakeholders on climate change mitigation options in the land sector.)//Elmer

The world is getting a better understanding of just how important forests are in the global **fight against climate change**. New research, published in Nature Climate Change and available on Global Forest Watch, found that the world’s forests **sequestered** about **twice as much carbon** dioxide **as they emitted** between 2001 and 2019. In other words, forests provide a “carbon sink” that absorbs a net **7.6 billion metric tonnes** of CO2 per year, **1.5 times more carbon than the United States** emits annually. Before now, scientists estimated these global “carbon fluxes” from the sum of country-reported data, creating a coarse picture of the role forests play in both carbon emissions and sequestration. With these new data that combine ground measurements with satellite observations, we can now quantify carbon fluxes consistently over any area, from small local forests to countries to entire continents. Using this more granular information, we found that the world’s forests emitted an average of 8.1 billion metric tonnes of carbon dioxide into the atmosphere each year due to deforestation and other disturbances, and absorbed 16 billion metric tonnes of CO2 per year. Here’s a look at what else the new maps tell us about forests and carbon: Only One Major Tropical Rainforest Remains a Strong Carbon Sink Tropical rainforests are far and away the most important ecosystems for mitigating climate change. Tropical rainforests collectively sequester more carbon from the atmosphere than temperate or boreal forests, but they’re also increasingly destroyed for agricultural expansion. The world’s three largest tropical rainforests are located in the Amazon, Congo River basin and Southeast Asia. Over the past 20 years, forests across Southeast Asia have collectively become a net source of carbon emissions due to clearing for plantations, uncontrolled fires and drainage of peat soils. The Amazon River basin, which stretches across nine countries in South America, is still a net carbon sink, but teeters on the edge of becoming a net source if forest loss continues at current rates. The Amazon basin has experienced heightened deforestation in the last four years due to clearing for cattle pasture and degradation from fires. Of the world’s three largest tropical rainforests, only the Congo has enough standing forest left to remain a strong net carbon sink. The Congo’s tropical rainforest **sequesters 600 million metric tonnes** more carbon dioxide per year than it emits, equivalent to about one-third of the CO2 emissions from all U.S. transportation. Protecting the remaining forests in all three regions **is critical to mitigating climate change**.

#### No water wars

* Most water crises don’t cause conflict
* Often results in collaboration through water sharing agreement development
* Main causation for water wars is weak institutional capacity and political and economic dynamics

Gleick 18 [Peter Gleick, MacArthur “Genius” Fellowship and was elected to the U.S. National Academy of Sciences, world-renowned expert, innovator, and communicator on water and climate issues, cofounded the Pacific Institute, which he led as president until mid-2016, pHd from UC Berkeley, and Charles Iceland, s Director, Global and National Water Initiatives with WRI’s Food, Forests, and Water Programs, “Water, Security, & Conflict”, https://pacinst.org/wp-content/uploads/2018/08/Water-Security-and-Conflict\_Aug-2018-2.pdf]

3.2. The Role of Governance in Water Security

Most water crises do not end in conflict, migration, or acute food insecurity. Instead, people muddle through until the crises recede. Some crises even generate cooperation among local or regional parties. Understanding why water crises lead to adverse outcomes in some places and better outcomes in others will help inform strategies for reducing the risks of conflict. Why, for example, did Syria sink into civil war following a record-breaking five-year drought, while .Iordan and Lebanon avoided strife following that same drought (Adams et al. 2018)? This requires integrating analyses of meteorological and resource-related events with the diverse social, political, and economic dynamics at play.

We can postulate—based on research conducted by Wolf and his colleagues (2003) on transboundary basins— that when rapid change, either on the institutional side or in the physical system, outpaces the institutional capacity to absorb that change, the stage is set for possible water insecurity. Therefore, when we go looking for water insecurity, we need to be on the lookout for large-scale water-related change and low capacity to handle such change (this Is what the Water, Peace, and Security [WPS] consortium is attempting to do via the development of a near realtime global early warning system for potential water-related threats to human security—more on this further on in this brief).

### 1NC – AT: Advantage 2

#### Zero risk of escalation from ASATs

**Pavur and Martinovic 19** [James Pavur and Ivan Martinovic, May 2019, "The Cyber-ASAT: On the Impact of Cyber Weapons in Outer Space," ResearchGate, 11th International Conference on Cyber Conflict: Silent Battle [https://www.researchgate.net/publication/334422193\_The\_Cyber-ASAT\_On\_the\_Impact\_of\_Cyber\_Weapons\_in\_Outer\_Space accessed 12/10/21](https://www.researchgate.net/publication/334422193_The_Cyber-ASAT_On_the_Impact_of_Cyber_Weapons_in_Outer_Space%20accessed%2012/10/21)]Adam

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 have recognized this dynamic and demonstrated an inclination towards de-escalatory space strategies [23].

B. Attributable Norms

There also exists a long-standing normative framework favouring the peaceful use of space. The effectiveness of this regime, centred around the Outer Space Treaty (OST), is highly contentious and many have pointed out its serious legal and political shortcomings [24]–[26]. Nevertheless, this status quo framework has somehow supported over six decades of relative peace in orbit.

Over these six decades, norms have become deeply ingrained into the way states describe and perceive space weaponization. This de facto codification was dramatically demonstrated in 2005 when the US found itself on the short end of a 160-1 UN vote after opposing a non-binding resolution on space weaponization. Although states have occasionally pushed the boundaries of these norms, this has typically occurred through incremental legal re-interpretation rather than outright opposition [27]. Even the most notable incidents, such as the 2007-2008 US and Chinese ASAT demonstrations, were couched in rhetoric from both the norm violators and defenders, depicting space as a peaceful global commons [27, p. 56]. Altogether, this suggests that states perceive real costs to breaking this normative tradition and may even moderate their behaviours accordingly.

One further factor supporting this norms regime is the high degree of attributability surrounding ASAT weapons. For kinetic ASAT technology, plausible deniability and stealth are essentially impossible. The literally explosive act of launching a rocket cannot evade detection and, if used offensively, retaliation. This imposes high diplomatic costs on ASAT usage and testing, particularly during peacetime.

C. Environmental Interdependence

A third stabilizing force relates to the orbital debris consequences of ASATs. China’s 2007 ASAT demonstration was the largest debris-generating event in history, as the targeted satellite dissipated into thousands of dangerous debris particles [28, p. 4]. Since debris particles are indiscriminate and unpredictable, they often threaten the attacker’s own space assets [22, p. 420]. This is compounded by Kessler syndrome, a phenomenon whereby orbital debris ‘breeds’ as large pieces of debris collide and disintegrate. As space debris remains in orbit for hundreds of years, the cascade effect of an ASAT attack can constrain the attacker’s long-term use of space [29, pp. 295– 296]. Any state with kinetic ASAT capabilities will likely also operate satellites of its own, and they are necessarily exposed to this collateral damage threat. Space debris thus acts as a strong strategic deterrent to ASAT usage.

#### Interdependence checks space war.

**Hall 15** [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>] recut Adam

* If you are also reading the Pavur evidence then unhighlight the debris stuff

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.

#### Deterrence solves.

**Evanoff 19** [Kyle Evanoff, Kyle is a research associate in international economics and U.S. foreign policy 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> accessed 12/11/21] Adam

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.

#### The Emerging tech impact is just a ton of assertions with no terminal impact – doesn’t even mention extinction or escalation once – means we get new 2nr responses to 1ar impacts

#### We will impact turn this laundry list – your ev concedes governance solves nanotech, synthetic biology, and drones – we read blue

Burrows ’16 [Mathew; September 16; Director of the Strategic Foresight Initiative at the Atlantic Council, Ph.D. in European History from Cambridge University; Atlantic Council Strategy Papers, “Global Risks 2035: The Search for a New Normal,” https://espas.secure.europarl.europa.eu/orbis/sites/default/files/generated/document/en/Global\_Risks\_2035\_web\_0922.pdf]

Need for a Second-Generation US and Western Leadership Model

War is not, and should not be, inevitable as the West struggles with the growing clout of China and other developing states on the world stage. Unlike during other transitions, the tools exist for ensuring more peaceful outcomes. They will require Western acquiescence to greater roles for the developing world to set and implement new rules of the road for the international order. A key feature of the post-1945 US design for the world order is its multilateralist structures. Many of these operate below most people’s radar. This plumbing of the international system has enabled the daily functioning of globalization. To keep it viable, China, as well as other developing countries, must be accorded more representation. There are too many long-term risks involved, for example, in China having only the equivalent of France’s voting rights in the IMF, when it is the first or second economic power in the world. This is how resentments are nurtured—all the more dangerous in China’s case because of its underlying “century of humiliation” mental complex. As emerging technologies come online, the lack of a truly global institutional framework could be particularly dangerous. Assuring the future security of the Internet is particularly important in this regard, because all the new emerging technologies—bio, 3D printing, robotics, big data—take for granted a secure, global Internet. Everyone loses if cybercrime and cyber terrorism undermine the Internet. In the worst case scenarios, in which cyber crime proliferates or strong national borders fragment the Internet, an Atlantic Council study, as mentioned, found that the economic costs could be as much as $90 trillion out to 2030, in addition to the risk of open conflict.102 Besides bringing the emerging powers into leadership roles in the panoply of multilateral institutions, the United States will need to temper its often “exemptionalist” stance to ensure the survival of the multilateralist order. According to the Council on Foreign Relations’ Patrick Stewart, a prominent scholar of global governance, one of the persistent paradoxes of the post-1945 decades has been that the “United States is at once the world’s most vocal champion of a rules-based international order and the power most insistent on opting out of the constraints that it hopes to see binding on others.”103 No country has the networks and connections that the United States does, but the system is now polycentric, rather than unipolar, and others resent the “exceptional” privileges that the United States claims. The Global Trends works have talked about the need for a new model of US global leadership. The United States needs to be guiding the international system as a “first among equals,” and willing to play by its own rules. Paradoxically, there is likely to be no vibrant global-governance system without US and Western leadership, but too much domineering behavior could doom it. Even if the United States adapted its global role, this is not to say that the tensions and differences with many emerging powers would all disappear, or that the governance system would function seamlessly. In addition to the growing number of new state actors, the increasing importance of nonstate actors adds a new complexity to the functioning of global institutions. Moreover, there are clear-cut differences between the West and emerging powers on values-based issues, such as democracy promotion and the responsibility to protect. Many developing-country publics still resent Western colonialism and equate any intrusion with past historical wrong. They point to the 2011 humanitarian intervention in Libya, for example, as cover for the Western goal of regime change. Hence, the UN Security Council failure to stop the fighting in Syria, with more than two hundred thousand killed and 7.6 million displaced. Russia and China want to make a stand against the United States and the West getting their way and ousting the Assad regime. On the other hand, the lack of a solution smacks more of anarchy than global governance. Certainly, it shows one of the gaps that remains, and likely will remain, limiting global governance because of differences in values. The speed with which new technologies are coming online and becoming an important political, military, and economic tool—for both good and bad—carries big risks for global governance. Stewart Patrick lists four potential new technologies that “cry out for regulation”: geoengineering, drones, synthetic biology, and nanotechnology. Without some setting of rules for their operation, there is the risk of major disruptions, if not catastrophes, stemming from their abuse. The recent advances in synthetic biology lower the bar to abuse by amateurs and terrorists alike, forever affecting human DNA. Geoengineering involves planetary-scale interventions that could interfere with complex climatic systems. However cumbersome, politically unpopular, and ineffective at times, there is little alternative to increased global cooperation if one does not want to see higher risks of conflict and economic degradation. Without some sort of bolstered global governance, the West would end up with less sovereignty in a “dog-eat-dog” world, in which it was increasingly in the minority. But can the United States and the West rise to the challenge of investing in a global-governance system that will not always favor their interests on every issue? Historically, the United States could be especially generous because it was on top of the world in about everything after the Second World War. Europeans came to truly believe in pooling sovereignty and joint governance after centuries of internecine conflict. The tough economic times at home have seen US and European publics become distrustful of overarching multilateral institutions, believing the will of the United States or individual European countries will not be served. It is oftentimes easier for political leaders to fall in with the public mood rather than display leadership that might appear to work against it.

#### Synthetic biotech is key to agricultural sustainability

Wurtzel et al 19 [Eleanor T. Wurtzel, Department of Biological Sciences, Lehman College, City University of New York, Graduate School and University Center-CUNY; Claudia E. Vickers, CSIRO Synthetic Biology Future Science Platform, Australian Institute for Bioengineering & Nanotechnology, University of Queensland; Andrew D. Hanson, Horticultural Sciences Department, University of Florida; A. Harvey Millar, ARC Centre of Excellence in Plant Energy Biology, School of Molecular Sciences, University of Western Australia; Mark Cooper, Queensland Alliance for Agriculture & Food Innovation, University of Queensland; Kai P. Voss-Fels, Queensland Alliance for Agriculture & Food Innovation, University of Queensland; Pablo I. Nikel, Novo Nordisk Foundation Center for Biosustainability, Technical University of Denmark; Tobias J. Erb, Max-Planck-Institute for Terrestrial Microbiology, Department of Biochemistry & Synthetic Metabolism, LOEWE Center for Synthetic Microbiology, December 2019, Nature Plants, “Revolutionizing agriculture with synthetic biology,” volume 5, no. 12, pg. 1-2, DOI: 10.1038/s41477-019-0539-0, accessed 8-12-2021] JMK recut Adam

Agricultural sustainability by design

There is every reasonable expectation that SynBio can drive unprecedented leaps in biomass and harvested yields, and at the same time improve the health of the agroecosphere2,12. We have first-generation examples of progress in these areas and of next-generation approaches that are in the pipeline now or soon will be. Together, these approaches add up to ‘sustainability by design’, as illustrated below.

Increasing net carbon fixation by crops can increase yields and, if some of the extra fixed carbon is partitioned to roots, it can also increase net long-term storage of carbon in the soil, thereby both improving soil quality and stripping CO2 from the air. Very encouragingly, installing synthetic photorespiratory pathways in tobacco boosted biomass production in the field by >40%13. For the future, researchers are developing even more daring ways to reconfigure photorespiration (for example, to make it carbon-conserving), to engineer novel carboxylases and synthetic CO2 fixation pathways that have no natural counterparts (Fig. 1), and to give crops CO2- concentrating mechanisms to enhance the efficiency of RubisCO8,14. Complementary to increasing carbon gain, approaches to cut respiratory carbon loss by increasing the energy efficiency of metabolic and transport processes are likewise gaining traction15.

As with metabolic pathways that are not optimally tailored for today’s agricultural conditions, so with plant architecture and development. Thus, coupling synthetic biosensors for endogenous signalling molecules or metabolites to specific regulatory elements can reprogram the formation of cells, tissues and organs16 to create ‘smart plants’ that adjust to the environment in new ways. Similarly, engineering an abscisic acid receptor to be activated by a synthetic molecule (that can be sprayed on a crop) can enable intervention to reduce water use in response to inputs (weather forecasts) that plants themselves cannot acquire17. Yet another fast-developing biosensor application is in the design of ‘sentinel plants’ that, through engineered biosensors hooked to suitable output circuitry, can monitor environmental cues ranging from nutrient levels to pollutants2,16

#### Food insecurity goes Nuclear

FDI 12 [Future Directions International, a Research institute providing strategic analysis of Australia’s global interests; citing Lindsay Falvery, PhD in Agricultural Science and former  Professor at the University of Melbourne’s Institute of Land and Environment, “Food and Water Insecurity: International Conflict Triggers and Potential Conflict Points,” [http://www.futuredirections.org.au/workshop-papers/537-international-conflict-triggers-and-potential-conflict-points-resulting-from-food-and-water-insecurity.html] //Elmer](http://www.futuredirections.org.au/workshop-papers/537-international-conflict-triggers-and-potential-conflict-points-resulting-from-food-and-water-insecurity.html%5d%20//Elmer)

There is a growing appreciation that the conflicts in the next century will most likely be fought over a lack of resources. Yet, in a sense, this is not new. Researchers point to the French and Russian revolutions as conflicts induced by a lack of food. More recently, Germany’s World War Two efforts are said to have been inspired, at least in part, by its perceived need to gain access to more food. Yet the general sense among those that attended FDI’s recent workshops, was that the scale of the problem in the future could be significantly greater as a result of population pressures, changing weather, urbanisation, migration, loss of arable land and other farm inputs, and increased affluence in the developing world. In his book, Small Farmers Secure Food, Lindsay Falvey, a participant in FDI’s March 2012 workshop on the issue of food and conflict, clearly expresses the problem and why countries across the globe are starting to take note. . He writes (p.36), “…if people are hungry, especially in cities, the state is not stable – riots, violence, breakdown of law and order and migration result.” “Hunger feeds anarchy.” This view is also shared by Julian Cribb, who in his book, The Coming Famine, writes that if “large regions of the world run short of food, land or water in the decades that lie ahead, then wholesale, bloody wars are liable to follow.” He continues: “An increasingly credible scenario for World War 3 is not so much a confrontation of super powers and their allies, as a festering, self-perpetuating chain of resource conflicts.” He also says: “The wars of the 21st Century are less likely to be global conflicts with sharply defined sides and huge armies, than a scrappy mass of failed states, rebellions, civil strife, insurgencies, terrorism and genocides, sparked by bloody competition over dwindling resources.” As another workshop participant put it, people do not go to war to kill; they go to war over resources, either to protect or to gain the resources for themselves. Another observed that hunger results in passivity not conflict. Conflict is over resources, not because people are going hungry. A study by the International Peace Research Institute indicates that where food security is an issue, it is more likely to result in some form of conflict. Darfur, Rwanda, Eritrea and the Balkansexperienced such wars. Governments, especially in developed countries, are increasingly aware of this phenomenon. The UK Ministry of Defence, the CIA, the US Center for Strategic and International Studies and the Oslo Peace Research Institute, all identify famine as a potential trigger for conflicts and possibly even nuclear war.

#### Synthetic biology solves cancer.

**Jain 12** [Kewal K. Jain, Consultant in biotechnology and pharmaceutical medicine. Research in cell/gene therapy, neuroprotection, and nanobiotechnology. Reviewer, research grant applications for government agencies in Canada, USA (US Army) and Europe (European Commission, the Netherlands, Austria, Finland, Estonia and UK). Chairman of the Scientific Advisory Board, Genometrica Ltd, Lugano, Switzerland. Member of Board of Managers of Progenitor Cell Therapy 2006-2010, until takeover of the company by NeoStem Inc. Member Editorial Board, Nanomedicine, published by Future Medicine. Member Editorial Board, Technology in Cancer Research and Treatment, Adenine Press. Member International Advisory Board, Medical Principles & Practice, Karger. Consultant in Neurology Senior Associate editor, MedLink Corporation, San Diego, California. 08-16-2012, accessed on 9-11-2021, PubMed Central (PMC), "Synthetic Biology and Personalized Medicine", <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5586729/>] Adam

Most of the current treatments of cancer do not discriminate between cancer and normal tissues. Besides individual variations, personalized therapy takes into consideration the fact that cancer varies both genetically and phenotypically among patients who may have identical type and stage of cancer. Personalized therapy aims to deliver therapy to the malignant tumors while sparing normal tissues. Synthetic biology provides many opportunities for design of personalized therapies for cancer.

Sequencing, Synthetic Biology and Personalized Therapy of Cancer

Discoveries made through application of human genome sequencing have already an impact on practice of oncology and have influenced the design of clinical trials for new cancer therapies. In the future, research into cancer will expand to generate full genome sequences of various cancers, yielding complete catalogues of somatic mutations in each one. These studies will reveal essentially the full repertoire of mutated cancer genes, enabling us to determine how many and what combinations of mutated cancer genes are necessary to generate an individual cancer. Sequencing is evolving from a research tool to applications for cancer diagnostics. Analyses of the cancer genome as well as the transcriptome and their applications into clinical trials in order to exploit the full clinical potential of information within the cancer genome are generating new predictors of drug responsiveness and prognosis, which will enable personalized management of cancer [[36](https://www.karger.com/Article/Fulltext/341794#ref36)].

Synthetic Bacteria for Personalized Eradication of Brain Cancer

Bacteria can be synthetically engineered to target, invade and destroy cancer cells selectively, or knock down a specific, endogenous cancer-related network of genes. An example of the potential application of this approach is brain cancer (glioblastoma multiforme), which is one of the most challenging cancers, and efforts to cure it have failed in over 100 years of history of modern neurosurgery. The challenge is due to complete eradication required for cure as even a few residual cells multiply rapidly with recurrence of the tumor that kills the patient. Response to conventional treatments such as surgical resection and chemotherapy varies according to the characteristics of individual tumors, but none are curative.

One of the innovations is the use of genetically modified bacteria to selectively destroy the tumor without invading the surrounding normal brain [[37](https://www.karger.com/Article/Fulltext/341794#ref37)]. Genetic modification of bacteria is complicated as it requires selection of aggressive invasive species and extensive modifications, i.e. excision of harmful genes and insertion of genes for selective destruction of the tumor. Synthetic bacteria may be easier to construct and designed according to the characteristics of an individual tumor and the required tasks with better prospects of cure.

#### Contagious Cancer is a major and legitimate threat AND causes extinction.

Johnson 16 George Johnson 2-23-2016 “Scientists Ponder the Prospect of Contagious Cancer” <https://www.nytimes.com/2016/02/23/science/scientists-ponder-the-prospect-of-contagious-cancer.html?mcubz=0> (columnist and science journalist for the New York Times, M.A. in Journalism and Public Affairs, American University)//Elmer

For all its peculiar horror, cancer comes with a saving grace. If nothing else can stop a tumor’s mad evolution, the cancer ultimately dies with its host. Everything the malignant cells have learned about outwitting the patient’s defenses — and those of the oncologists — is erased. The next case of cancer, in another victim, must start anew. Imagine if instead, cancer cells had the ability to press on to another body. A cancer like that would have the power to metastasize not just from organ to organ, but from person to person, **evolving deadly new skills** along the way. While there is no sign of an imminent threat, several recent papers suggest that the eventual emergence of a contagious human cancer is in the realm of medical possibility. This would **not be a disease**, like cervical cancer, that is set off by the spread of viruses, but rather one in which cancer cells actually travel from one person to another and thrive in their new location. So far this is known to have happened only under the most unusual circumstances. A 19-year-old laboratory worker who pricked herself with a syringe of colon cancer cells developed a tumor in her hand. A surgeon acquired a cancer from his patient after accidentally cutting himself during an operation. There are also cases of malignant cells being transferred from one person to another through an organ transplant or from a woman to her fetus. On each of these occasions, the malignancy went no further. The only known cancers that continue to move from body to body, evading the immune system, have been found in other animals. In laboratory experiments, for instance, cancer cells have been transferred by mosquitoes from one hamster to another. And so far, three kinds of contagious cancers have been discovered in the wild — in dogs, Tasmanian devils and, most recently, in soft shell clams. The oldest known example is a cancer that spreads between dogs during sexual intercourse — not as a side effect of a viral or bacterial infection, but rather through direct conveyance of cancer cells. The state of the research is described in a review, “The Cancer Which Survived,” published last year by Andrea Strakova and Elizabeth P. Murchison of the University of Cambridge. The condition, canine transmissible venereal tumor disease, is believed to have sprung into existence 11,000 years ago — as a single cell in a single dog — and has been circulating ever since. (Why did this happen in dogs and not, say, cats? Perhaps because of what the authors demurely call the dogs’ “long-lasting coital tie” — the half an hour or so that a male and female are locked in intercourse, tearing genital tissues and providing the cancer cells with a leisurely crossing.) Normally a cancer evolves in a single body over the course of years or decades, accumulating the mutations that drive it to power. But to have survived for millenniums, researchers have proposed, canine cancer cells may have developed mechanisms — like those in healthy cells — to repair and stabilize their own malignant genomes. Early on, cancer cells typically flourish by **disabling DNA repair** and ramping up the **mutational frenzy**. Somewhere along the way, the age-old canine cells may have reinvented the device to extend their own longevity. There is also speculation that this cancer may have learned to somehow modify canine sexual behavior in ways that promote the disease’s spread and survival. The second kind of contagious cancer **was discovered in** the mid-1990s in **Tasmanian devils**, which spread malignant cells as they try to tear off one another’s faces. Though it may be hard to sympathize, devil facial tumor disease threatens the creatures with extinction. With so few examples, transmissible cancer has been easy to dismiss as an aberration. But in December, scientists at the Universities of Tasmania and Cambridge reported in Proceedings of the National Academy of Sciences that Tasmanian devils are passing around another kind of cancer — genetically distinct from the first. It’s weird enough that one such cancer would arise in the species. What are the chances that there would be two? One theory is that the animals are unusually vulnerable. Driven so close to extinction — by climate change, perhaps, or human predators — the species is lacking in genetic diversity. The cells of another devil injected through a vicious wound may seem so familiar that they are ignored by the recipient’s immune system. If some of the cells carry the mutations for the facial cancer, they might be free to flourish and develop into a new tumor. But the scientists also proposed a more disturbing explanation: that the emergence of contagious cancer may not be so rare after all. “The possibility,” they wrote, “warrants further investigation of the risk that such diseases could arise in humans.” Cancer has probably existed ever since our first multicellular ancestors appeared on Earth hundreds of millions of years ago. The life spans of even the longest-lived animals may be just too brief for cancers to easily evolve the ability to leap to another body. Otherwise, contagious cancer would be everywhere.

#### Nanotech solves every existential threat

**Miller 17,** Gina Miller, She has written articles and provided interviews on the subject of nanotechnology and created digital artwork, videos and animations to illustrate future applications. Her work has been featured in various media including the History Channel, Japanese television, international documentaries, Wired, PC Magazine, Fast Company, and various books such as “Nanofuture” by J. Storrs Hall, the inventor of the “utility fog” concept. Miller has collaborated with other nanotechnology pioneers such as Robert A. Freitas Jr., author of “Nanomedicine,” and is a frequent collaborator of the Foresight Institute co-founded by K. Eric Drexler the “founding father of nanotechnology”.. 2-26-2017, accessed on 1-28-2021, Nanotechnology Industries, "Nanotechnology, the real science of miracles, the end of disease, aging, poverty and pollution - Nanotechnology Industries", http://nanoindustries.com/nanotechnology\_science\_of\_miracles/ //Adam

The current status of disease and death is staggering. We do know that in the documented world 56 million people die every year. Dissecting the statistics of disease provided by the World Health Organization is overwhelming to weed through. There is a solution. Or there may be in the future. One day there could be a cure for all disease, and you may be able to live forever, in a healthy youthful state. One day it may be possible that scientists will be able to create nanorobots using nanotechnology. Nanotechnology is the ability to see and move atoms around. Everything is made of atoms, the chair you are sitting in, your food, your body, the air we breathe, everything. Atoms are so small they cannot be seen by the human eye. Atoms are on the nanoscale, that's a teeny, tiny size. There are 25,400,000 nanometers in an inch, a sheet of newspaper is 100,000 nanometers thick, human hair is about 80,000 nanometers in diameter. Atoms are the building blocks. Different atoms, arranged in different ways, make molecules that make the different things you see and experience. In the human body atoms come together to make many things, for example water, fats, hair, bones, and DNA. DNA and other molecules build cells; sometimes cells malfunction and cause disease. Where does nanotechnology fit in? That's a self realizing question, that's how, it fits in! Think of it this way, if you were King Kong, could you grab one grain of sand easily? Your hands would be too big. That's how medicine is currently treating disease. Nanotechnology is on the same size and scale as disease. A nanorobot can grab a cell and repair it. This will allow us to cure diseases that have never been cured before. Nanorobots could be released into the blood stream via pill or injection to find and repair damage and then break down and disintegrate. Or nanorobots could remain in the body at all times, perpetually monitoring, identifying and repairing problems immediately, without any external treatment. Nanorobots would cure the aliment so early on that you would never even know you were going to get sick. Chemotherapy releases toxic chemicals throughout the entire body rather than just the affected area, such as a tumor. This process destroys the cancer but also the immune system. Chemotherapy makes patients very sick, and there is risk of permanent damage or death from the treatment itself. There is also a risk of the cancer returning. A nanorobot could have radiation inside of it, locate the tumor, inject it and destroy it directly. Molecular nanorobots wouldn't leave one cancerous cell behind. That's one of the benefits of getting down to the molecular level. Doctors cannot see on the molecular level and could easily miss some cancer cells, which is often the case and the cancer returns. A nanotech gene therapy has successfully killed ovarian cancer in mice; if successful in human clinical trials it could save the lives of 15000 women a year. But it doesn't stop with cancer. Every disease is made out of the same atoms that everything else is. All medical conditions are a result of atoms being out of place; a nanorobot could put them back where they belong, thus immediately alleviating the problem without the side effects that current day medication and treatments cause. What else can be repaired in the human body? EVERYTHING. From cancer to the common cold. There is nothing that nanotechnology could not repair. The injuries or illnesses you have right now will have the capability to be repaired or cured by nanotechnology. Nanotechnology could eliminate diseases, disabilities, and illnesses such as diabetes, malaria, HIV, cardiovascular disease, damage from injuries and accidents, heal wounds, reduce child mortality, regenerate limbs and organs, eliminate inflammatory/infectious diseases, and so on and so forth. Nanotechnology offers hope to people suffering from Alzheimer’s, Parkinson's, brain injuries, tumors and neurological disorders. Nanoconstructs could deliver neuroprotective molecules directly to the brain to recover or protect nerve cells from damage or degeneration. Nanotechnology has been emerging in this field in the form of nanoengineered scaffolds that could one day result in a tool for rewiring the intricate neuronal network. Research by Dr. Samuel I. Stupp designed molecules using nanomaterials and injected them into mice who were paralyzed due to spinal cord injury. After 6 weeks the mice regained the ability to walk. Research like this could one day evolve into real cures for people. 65 billion dollars is wasted every year due to low bioavailability. Meaning that the drug or treatment used is not absorbed into or accessed by the body properly due to a multitude of reasons. For example drug interactions, different molecular arrangements and manufacturing processes by different brands. Drugs with more moisture may form lumps in the stomach which decreases absorption, and a highly compressed pill will slow absorption. Different level changes in the body at any given time may cause drug toxicity. Metabolism, age, activity, stress, previous surgery and syndromes are also factors. These are huge challenges that can be alleviated by using nanotechnology to target the specific areas. Nanorobots can take their cues from mother nature; she is the first nanotechnologist. She is an expert at creating molecular machines. Geneticists have been taking advantage of viruses for use in gene therapy for some time. They modify a virus by removing the viral gene so it doesn't cause disease. They replace it with healthy genes to transport to the faulty cell and cure diseases. This strategy of hacking viruses could be exploited by nanotech. Viruses are biological molecular machines that could be modified into becoming nanorobots or they could become transportation for a nanorobot. Another means is a nanorobot could attach itself to a traveling white blood cell and ride shotgun to assist in the tissue repair of injured tissue. Nanotechnology could even be involved in tissue engineering, creating scaffolds for artificial organs and implants. Tissue from your own body could be used to make new tissue, which assures that your body doesn't reject it. The surgeries of today are painful, costly, can leave scars and can even be life threatening. Repairing nanorobots would eliminate the need for surgeries, incisions, side effects and recovery time. According to the American Academy of Periodontology there are links to poor dental health and stroke, heart disease, respiratory disease, osteoporosis, some cancers and diabetes. Nanorobots as nanodentistry could repair damage without large needles or drills. Nanorobots could also constantly and invisibly maintain and clean your teeth to avoid any dental problems. Hygiene is important for good health; your skin and hair could be cleaned by nanorobots eliminating the need for showers. Spider bites and ticks carrying lyme disease would be detected by nanorobots, blocking penetration. Other skin problems such as eczema would be repaired by dermal nanorobots. Is aging a disease? Could aging be cured? Yes. Since nanorobots would be able to repair single cells on the molecular level they would be able to repair damages created by aging. It's all the same to a nanorobot. Nanotechnology could repair damaged cells. Dead cells are the primary reason for aging and death; nanorobots could replace senescent (old) cells with non-senescent cells, or reprogram cells so they do not senescensce, which would keep the body from aging. Not only would the inside of your body never get sick or age, but neither will the outside. Your skin will be young, elastic, dewy and wrinkle-free. Your hair will be thick, without gray, and intact. Your hearing, your eyesight and memory will be in perfect shape. You wouldn't get arthritis, turkey neck, or saggy parts. You could go out dancing when you are 93 and not worry about sore feet, low energy or suffering any consequences. Unless you party too hard, but that's on you, not the nano. So if you never get sick and never get old could you live forever? Yes. nanorobots could be programmed to rebuild older cells into younger copies on a regular basis thereby the human body could become immortal. You could live a disease-free youthful life, forever. Of course immortality isn't for everyone and everyone should have the right to decide what they want or don't want for their own body. Death will be a choice rather than a requirement. There are well funded countries that have access to researchers and high tech equipment that would love to figure out how to create the nanotechnology that will repair bodies and end disease. In the US despite having a lot of financial resources it's not always easy to get funding. If you are at a university, you need to write a grant, go through a lot of red tape, and there are a lot more near-term projects that seem to get prioritized when it comes to funding. For companies looking for investors, unfortunately not all investors can foresee the amazing future that nano will have because they are used to funding things they can see. For example a company that makes desks seeking an investor can show the investor the money they need for each piece of wood, bolt, and the quantity of desks that will be manufactured within a specific time frame. Nanotechnology is in development and isn't readily available like a piece of wood, the piece of wood has to be built. And the individual processes of each emerging development will have their own variables. Once the recipe has been figured out and formulated, the investment we have made will then be very inexpensive and easy to reproduce. Third world countries would have easy access to nanomedicine. Mother nature puts atoms together all the time and it doesn't cost her anything. The raw materials for making nanorobots would be essentially cost-free because they will be made mostly of carbon. Because nanotechnology would be created on the very small atomic level, traveling to provide treatment would not require large equipment. The size and portability would make treatment easily accessible across the world. The environment and living conditions also impact health. Since nanotechnology is on the atomic level and atoms are everywhere, it can be beneficial to the world all around us, as well as our bodies. Nanotechnology could enrich depleted soil in places like Africa, which is currently facing a food crisis. Vitamins, nutrients and minerals could be delivered to rebuild soil to a fertile state and thus have the ability to grow food. Hunger could one day be a solvable problem. Nanotechnology would make it possible to provide meat and animal products inexpensively without killing animals. E.coli and other pathogens could be detected in soil and eliminated so that food is not harmful. Currently nanomaterials are in development to release fertilizers for plants and nutrients for livestock, nano sensors for monitoring the health of crops and farm animals, and magnetic nanoparticles to remove soil contaminants. According to water.org 750 million people around the world lack access to safe water; approximately one in nine people. 840,000 people die each year from water-related disease. A portable non-chemical nano-filtration water purification device has been developed by Micheal Pritchard. It creates safe and sterile water out of dirty water and would make the cost of water per household an estimated 3 dollars a year. His company has provided clean water to countries who have gone through natural disasters, such as Haiti and the Philippines. In the future nanotechnology particles could destroy bacteria that often cause fatal disease. Pollution in general, global warming, nuclear waste, oil spills, smog, and acid rain, could be remedied and prevented by nanotechnological advances. Large quantities of nanorobots could come together to remove pollutant atoms from the atmosphere, earth and water. These groups of nanorobots could swim in contaminated waters and be released into the polluted atmosphere to destroy or remove contaminating molecules. Nanorobots could pull apart the bad molecules and reassemble the atoms into good molecules for other positive purposes. As a first indicator of the possibility, Brian Mercer created a new pollution control technology using nanofibres that greatly reduce industrial pollution by trapping and removing the pollutants. Currently nanotech is being used to reduce emissions from car fuels. Since nanotechnology builds atom by atom; the process is pollution free. Nanotechnology will not be manufactured in the way we use manufacturing plants today. There will be no chemical by product, no emission, hazardous waste and no pollution.