# 1AC

## Advocacy

#### I Affirm: Resolved: The Appropriation of Outer Space by Private Entities is Unjust.

## Definitions

#### I propose the following definitions for clarity in today’s debate round:

#### Appropriation

**UN Outer Space Treaty ’67** (United Nation Outer Space Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 1967, Article II. [https://www.unoosa.org/pdf/publications/STSPACE11E.pdf Signed 27 January 1967](https://www.unoosa.org/pdf/publications/STSPACE11E.pdf%20Signed%2027%20January%201967)) // ELog

Article II Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

#### I’ll defend that colonization of space would be an appropriation – colonizing would probably require a claim of sovereignty, and definitely require use and occupation

#### Private entities

**US Code ‘47** (US Code, Title 6, Chapter 6, Subchapter I, Section 1501. Definitions <https://www.law.cornell.edu/uscode/text/6/1501#15_A> Enacted by Congress 1947) // ELog

(15)Private entity (A)In general Except as otherwise provided in this paragraph, the term “[private entity](https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=6-USC-625312480-168358316&term_occur=1&term_src=title:6:chapter:6:subchapter:I:section:1501)” means any [person](https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=6-USC-991716523-125484930&term_occur=169&term_src=title:6:chapter:6:subchapter:I:section:1501) or private group, organization, proprietorship, partnership, trust, cooperative, corporation, or other commercial or nonprofit entity, including an officer, employee, or agent thereof. (B)Inclusion The term “[private entity](https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=6-USC-625312480-168358317&term_occur=4&term_src=title:6:chapter:6:subchapter:I:section:1501)” includes a [State,](https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=6-USC-80204913-794772950&term_occur=193&term_src=title:6:chapter:6:subchapter:I:section:1501) [tribal,](https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=6-USC-865479038-2019934296&term_occur=3&term_src=title:6:chapter:6:subchapter:I:section:1501) or [local government](https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=6-USC-801009210-2019934304&term_occur=3&term_src=title:6:chapter:6:subchapter:I:section:1501) performing utility services, such as electric, natural gas, or water services. (C)Exclusion The term “[private entity](https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=6-USC-625312480-168358317&term_occur=5&term_src=title:6:chapter:6:subchapter:I:section:1501)” does not include a [foreign](https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=6-USC-677674796-125484930&term_occur=133&term_src=title:6:chapter:6:subchapter:I:section:1501) power as defined in [section 1801 of title 50](https://www.law.cornell.edu/uscode/text/50/1801).

#### This means what governments can and cannot do in space is irrelevant to this debate – it is a question only of what private entities can do and how just it is

#### The resolution asks whether appropriation is unjust – that’s defined by Oxford Languages as “not based on or behaving according to what is morally right and fair.” (<https://www.google.com/search?q=unjust+definition&oq=unjust+definition&aqs=chrome..69i57j0i512l4j0i22i30l5.4449j1j4&sourceid=chrome&ie=UTF-8>)

#### This means it is not the Affirmative’s burden to prove that a world where private entities do not appropriate space is achievable, but rather, that such a world would be preferable to one where they did appropriate space

## Value and Criterion

#### The value is life – I’ll defend it as the biological state of being alive – prefer it

#### It’s intrinsic good – other values are subjective, being alive is objectively preferable

#### It’s a precondition to other values – we can’t have equality, justice, value to life, etc. if we are already dead

#### It’s quantifiable – we can measure whether someone is alive or not, but moral values are invisible and subjective

#### The value criterion is reverse utilitarianism – I’ll defend it as achieving the minimum amount of suffering – prefer it

#### It’s measurable – we can objectively compare body counts – that’s important for debates with a forced decision at the end, anything else necessitates judge intervention

#### It supercharges reversibility – I’ll isolate impacts of extinction, which is the ultimate irreversible impact. If we go extinct, that’s it forever

#### Combined, my value and value criterion means you’ll evaluate the round based on who can avoid the most death

## Contention 1 - Capitalism

#### Private space development shields impacts of Earthly capitalism and exports them universally

**Temmen ’21** (Jens Temmen; Assistant Professor of American Studies at Heinrich-Heine-University Dusseldorf. “WHY BILLIONAIRES IN SPACE ARE NOT GOING TO MAKE THE WORLD A BETTER PLACE” <https://blog.degruyter.com/today-space-is-virgin-territory-why-billionaires-in-space-are-not-going-to-make-the-world-a-better-place/> 14 July 2021) // ELog

On July 11th 2021, Virgin Galactic founder, billionaire and self-declared new space tourism pioneer Richard Branson staged the first commercial flight of his company’s supersonic space-plane Unity – with Branson aboard himself and thus upstaging Amazon founder Jeff Bezos‘ own flight by just a few days. Virgin Galactic lauded the perfectly orchestrated performance as following the path of the Apollo missions, while also heralding a new and invigorated phase of space exploration – this time with commercial flights and space tourism leading the way. Branson and the other so-called New Space Entrepreneurs, Elon Musk and Jeff Bezos, might be competitors in their private race to space, yet all of them are deeply invested in surrounding their private enterprises with a shared narrative of a utopian future for humanity in outer space, and even as much as humanity‘s survival in face of climate change on Earth, by way of becoming a multiplanetary species. For the most part that story isn’t new, of course. The idea that entering and colonizing outer space provides a unifying experience for humanity has been popularized by science-fiction for quite a while now – a tune that many planetary scientists, by the way, have happily sung along with. What has changed is that in the latest version of that popular narrative, the only path leading towards utopia goes through a privatized space industry. Yet in spite of allegedly pointing the way into a better, more just, and more sustainable future for humanity, most of these imaginaries tend to wrap their visions into the rather stale and very earthly language of discovery and exploration, of new frontiers, terra nullius (“nobody’s land“), and of colonization – imageries and terms which have and continue to justify removal, extraction, exploitation and genocide. The billionaires’ space race is no exception to that rule: the quote that marked Branson’s entry into sub-orbital height – “Today space is Virgin territory“ – is not just a clever pun on the company’s name, but also revealingly invokes the misogynist and colonial notions of “untouched“ land and people that are ready for the taking. These notions have served Euro-American empires for centuries as justification for brutally claiming new territories and racially hierarchizing their population. But what’s the harm, one might ask, in rehashing these concepts in context of the exploration of outer space? With no Indigenous population (that we know of) that can be removed, no pre-colonial civilization in the way of Earth’s future colonies on Moon and Mars, isn’t space colonialism something truly new, completely divorced from the history of terrestrial colonialism? Branson, Musk and Bezos would most certainly agree. “Contrary to what the private space industry (and national space agencies, for that matter) wants us to believe, the exploration and colonization of outer space is a very terrestrial undertaking.” The question ignores the fact that contrary to what the private space industry (and national space agencies, for that matter) wants us to believe, the exploration and colonization of outer space is a very terrestrial undertaking. Steeped in capitalism – a system that Branson, Musk and Bezos have mastered and thrived in – and the geopolitical stratagems of Earth’s nation-states, space exploration today is not so much driven by changing humanity as it goes into space, but rather by changing outer space to make it fit into the logics of profit and territorial control on Earth. And we are in the thick of it: Branson’s latest attempt to establish space travel as a new branch of the tourism industry is just one of many recent steps – including the establishment of US Space Force, the ratification of the Artemis Accords, and the signing on of Musk’s SpaceX as a contractor for NASA – to make outer space safe for capitalism. The point of the performative character of the billionaires’ space race, the images of grandeur and individualism, the bells and whistles, its alleged subscription to a more just future for humanity, is to distract, then. It is a shiny packaging that wraps-up and obscures the mundane fact that if colonizing outer space is allegedly about fundamentally changing societally structures that govern Earth and humanity, the New Space Entrepreneurs are certainly not the ones to bring about that change – it would simply be against their self-interest. In Earth’s past and present, the colonial language of virgin land and terra nullius served to obscure the human cost of colonization by dehumanizing colonized peoples. Space exploration, as imagined by Branson, Musk and Bezos, also has a cost. The wealth that all three of them have acquired through their business ventures, which puts them into the position to reach for the stars (and greater profits), builds on unleashed neoliberalism, capitalist exploitation, and, overall, less-than altruistic business models. Their vision of humanity in space is likewise designed for the few and wealthy, and built on the back of the many. And the cost could increase even further. While all of humanity is facing the unprecedented threat of climate change, which urges us to find sustainable solutions fast, Elon Musk and others offer us the seemingly quick fix of abandoning Earth altogether and to weather out the storm on Mars. In spite of being completely unfeasible from a scientific standpoint, the idea has still gained traction among technoliberalists, and is thus withdrawing attention and resources from communities mostly in the Global South for whom climate change is not a threat in the distant future. In addition, the noise and smoke created by the hyper-masculine performances of Branson, Musk and Bezos block our view of the tangible benefits that space exploration has to offer and that we should readily invest in. Current Mars exploration projects, for example, offer insights into how atmospheric changes impact planetary climates – information that could prove invaluable in our battle against climate change on Earth. All of this is a reminder that we should not abandon the idea altogether that space exploration can offer us new and vital insights. Space exploration is, however, not going to magically change humanity or how we live. If we want to continue to hope that space exploration will fulfill the promise of a better future for humanity, changing our perspectives on life on Earth must come first.

**Capitalism is terminally unsustainable and makes extinction inevitable**

**Foster ‘19** (John Bellamy; Professor of Sociology @ the University of Oregon, Ph.D. in Political Science @ York University, editor of the Monthly Review, former Critical Essay Editor/Archives Editor, Organization & Environment, editor and author of numerous books and articles about economics, environment, and capitalism [John, “Capitalism Has Failed—What Next?” 2/1/2019, <https://monthlyreview.org/2019/02/01/capitalism-has-failed-what-next/>, DKP)

Less than two decades into the twenty-first century, it is evident that **capitalism has failed** as a social system. The world is mired in economic stagnation, financialization, and the most extreme inequality in human history, accompanied by mass unemployment and underemployment, precariousness, poverty, hunger, wasted output and lives, and what at this point can only be called a planetary ecological “death spiral.”1 The digital revolution, the greatest technological advance of our time, has rapidly mutated from a promise of free communication and liberated production into new means of surveillance, control, and displacement of the working population. The institutions of liberal democracy **are at the point of collapse**, while fascism, the rear guard of the capitalist system, is again on the march, along with patriarchy, racism, imperialism, and war. To say that capitalism is a failed system is not, of course, to suggest that its breakdown and disintegration is imminent.2 It does, however, mean that it has passed from being a historically necessary and creative system at its inception to being a historically unnecessary and destructive one in the present century. Today, more than ever, the world is faced with the epochal choice between “the revolutionary reconstitution of society at large and the common ruin of the contending classes.”3 Indications of this failure of capitalism are everywhere. Stagnation of investment punctuated by bubbles of financial expansion, which then inevitably burst, now characterizes the so-called free market.4 Soaring inequality in income and wealth has its counterpart in the declining material circumstances of a majority of the population. Real wages for most workers in the United States have barely budged in forty years despite steadily rising productivity.5 Work intensity has increased, while work and safety protections on the job have been systematically jettisoned. Unemployment data has become more and more meaningless due to a new institutionalized underemployment in the form of contract labor in the gig economy.6 Unions have been reduced to mere shadows of their former glory as capitalism has asserted totalitarian control over workplaces. With the demise of Soviet-type societies, social democracy in Europe has perished in the new atmosphere of “liberated capitalism.”7 The capture of the surplus value produced by overexploited populations in the poorest regions of the world, via the global labor arbitrage instituted by multinational corporations, is leading to an unprecedented amassing of financial wealth at the center of the world economy and relative poverty in the periphery.8 Around $21 trillion of offshore funds are currently lodged in tax havens on islands mostly in the Caribbean, constituting “the fortified refuge of Big Finance.”9 Technologically driven monopolies resulting from the global-communications revolution, together with the rise to dominance of Wall Street-based financial capital geared to speculative asset creation, have further contributed to the riches of today’s “1 percent.” Forty-two billionaires now enjoy as much wealth as half the world’s population, while the three richest men in the United States—Jeff Bezos, Bill Gates, and Warren Buffett—have more wealth than half the U.S. population.10 In every region of the world, inequality has increased sharply in recent decades.11 The gap in per capita income and wealth between the richest and poorest nations, which has been the dominant trend for centuries, is rapidly widening once again.12 More than 60 percent of the world’s employed population, some **two billion people**, now work in the impoverished informal sector, forming a massive global proletariat. The global reserve army of labor is some 70 percent larger than the active labor army of formally employed workers.13 Adequate **health care**, **housing**, **education**, and **clean water** and **air** are increasingly out of reach for large sections of the population, even in wealthy countries in North America and Europe, while transportation is becoming more difficult in the United States and many other countries due to irrationally high levels of dependency on the automobile and disinvestment in public transportation. Urban structures are more and more characterized by **gentrification** and **segregation**, with cities becoming the playthings of the well-to-do while marginalized populations are shunted aside. About half a million people, most of them children, are homeless on any given night in the United States.14 New York City is experiencing a major rat infestation, attributed to warming temperatures, mirroring trends around the world.15 In the United States and other high-income countries, life expectancy is in decline, with a remarkable resurgence of Victorian illnesses related to poverty and exploitation. In Britain, gout, scarlet fever, whooping cough, and even scurvy are now resurgent, along with tuberculosis. With inadequate enforcement of work health and safety regulations, black lung disease has returned with a vengeance in U.S. coal country.16 Overuse of antibiotics, particularly by capitalist agribusiness, is leading to an **antibiotic-resistance crisis**, with the dangerous growth of superbugs generating increasing numbers of deaths, which by mid–century could surpass annual cancer deaths, prompting the World Health Organization to declare a “global health emergency.”17 These dire conditions, arising from the workings of the system, are consistent with what Frederick Engels, in the Condition of the Working Class in England, called “social murder.”18 At the instigation of giant corporations, philanthrocapitalist foundations, and neoliberal governments, public education has been restructured around corporate-designed testing based on the implementation of robotic common-core standards. This is generating massive databases on the student population, much of which are now being surreptitiously marketed and sold.19 The corporatization and privatization of education is feeding the progressive subordination of children’s needs to the cash nexus of the commodity market. We are thus seeing a dramatic return of Thomas Gradgrind’s and Mr. M’Choakumchild’s crass utilitarian philosophy dramatized in Charles Dickens’s Hard Times: “Facts are alone wanted in life” and “You are never to fancy.”20 Having been reduced to intellectual dungeons, many of the poorest, most racially segregated schools in the United States are mere **pipelines for prisons or the military.**21 More than two million people in the United States are behind bars, a higher rate of incarceration than any other country in the world, **constituting a new Jim Crow.** The total population in prison is nearly equal to the number of people in Houston, Texas, the fourth largest U.S. city. African Americans and Latinos make up 56 percent of those incarcerated, while constituting only about 32 percent of the U.S. population. Nearly 50 percent of American adults, and a much higher percentage among African Americans and Native Americans, have an immediate family member who has spent or is currently spending time behind bars. Both black men and Native American men in the United States are nearly three times, Hispanic men nearly two times, more likely to die of police shootings than white men.22 Racial divides are now widening across the entire planet. Violence against women and the expropriation of their unpaid labor, as well as the higher level of exploitation of their paid labor, are integral to the way in which power is organized in capitalist society—and how it seeks to divide rather than unify the population. More than a third of women worldwide have experienced physical/sexual violence. Women’s bodies, in particular, are objectified, reified, and commodified as part of the normal workings of monopoly-capitalist marketing.23 The mass media-propaganda system, part of the larger corporate matrix, is now merging into a social media-based propaganda system that is more porous and seemingly anarchic, but more universal and more than ever favoring money and power. Utilizing modern marketing and surveillance techniques, which now dominate all digital interactions, vested interests are able to tailor their messages, largely unchecked, to individuals and their social networks, creating concerns about “fake news” on all sides.24 Numerous business entities promising technological manipulation of voters in countries across the world have now surfaced, auctioning off their services to the highest bidders.25 The elimination of net neutrality in the United States means further concentration, centralization, and control over the entire Internet by monopolistic service providers. Elections are increasingly prey to unregulated “dark money” emanating from the coffers of corporations and the billionaire class. Although presenting itself as the world’s leading democracy, the United States, as Paul Baran and Paul Sweezy stated in Monopoly Capital in 1966, “is democratic in form and plutocratic in content.”26 In the Trump administration, following a long-established tradition, 72 percent of those appointed to the cabinet have come from the higher corporate echelons, while others have been drawn from the military.27 War, engineered by the United States and other major powers at the apex of the system, has become perpetual in strategic oil regions such as the Middle East, and threatens to escalate into a global thermonuclear exchange. During the Obama administration, the United States was engaged in wars/bombings in seven different countries—Afghanistan, Iraq, Syria, Libya, Yemen, Somalia, and Pakistan.28 Torture and assassinations have been reinstituted by Washington as acceptable instruments of war against those now innumerable individuals, group networks, and whole societies that are branded as terrorist. A new Cold War and nuclear arms race is in the making between the United States and Russia, while Washington is seeking to place road blocks to the continued rise of China. The Trump administration has created a new space force as a separate branch of the military in an attempt to ensure U.S. dominance in the militarization of space. Sounding the alarm on the increasing dangers of a nuclear war and of climate destabilization, the distinguished Bulletin of Atomic Scientists moved its doomsday clock in 2018 to two minutes to midnight, the closest since 1953, when it marked the advent of thermonuclear weapons.29 Increasingly severe economic sanctions are being imposed by the United States on countries like Venezuela and Nicaragua, despite their democratic elections—or because of them. Trade and currency wars are being actively promoted by core states, while racist barriers against immigration continue to be erected in Europe and the United States as some 60 million refugees and internally displaced peoples flee devastated environments. Migrant populations worldwide have risen to 250 million, with those residing in high-income countries constituting more than 14 percent of the populations of those countries, up from less than 10 percent in 2000. Meanwhile, ruling circles and wealthy countries seek to wall off islands of power and privilege from the mass of humanity, who are to be left to their fate.30 More than three-quarters of a billion people, over 10 percent of the world population, are chronically malnourished.31 Food stress in the United States keeps climbing, leading to the rapid growth of cheap dollar stores selling poor quality and toxic food. Around forty million Americans, representing one out of eight households, including nearly thirteen million children, are food insecure.32 Subsistence farmers are being pushed off their lands by agribusiness, private capital, and sovereign wealth funds in a global depeasantization process that constitutes the greatest movement of people in history.33 Urban overcrowding and poverty across much of the globe is so severe that one can now reasonably refer to a “planet of slums.”34 Meanwhile, the world housing market is estimated to be worth up to $163 trillion (as compared to the value of gold mined over all recorded history, estimated at $7.5 trillion).35 The Anthropocene epoch, first ushered in by the Great Acceleration of the world economy immediately after the Second World War, has generated enormous rifts in planetary boundaries, extending from climate change to ocean acidification, to the sixth extinction, to disruption of the global nitrogen and phosphorus cycles, to the loss of freshwater, to the disappearance of forests, to widespread toxic-chemical and radioactive pollution.36 It is now estimated that 60 percent of the world’s wildlife vertebrate population (including mammals, reptiles, amphibians, birds, and fish) have been wiped out since 1970, while the worldwide abundance of invertebrates has declined by 45 percent in recent decades.37 What climatologist James Hansen calls the “species exterminations” resulting from accelerating climate change and rapidly shifting climate zones are only compounding this general process of biodiversity loss. Biologists expect that half of all species will be facing extinction by the end of the century.38 If present climate-change trends continue, the “global carbon budget” associated with a 2°C increase in average global temperature will be broken in sixteen years (while a 1.5°C increase in global average temperature—staying beneath which is the key to long-term stabilization of the climate—will be reached in a decade). Earth System scientists warn that the world is now perilously close to a Hothouse Earth, in which catastrophic climate change will be locked in and irreversible.39 The ecological, social, and economic costs to humanity of continuing to increase carbon emissions by 2.0 percent a year as in recent decades (rising in 2018 by 2.7 percent—3.4 percent in the United States), and failing to meet the minimal 3.0 percent annual reductions in emissions currently needed to avoid a catastrophic destabilization of the earth’s energy balance, are simply incalculable.40 Nevertheless, major energy corporations continue to lie about climate change, promoting and bankrolling climate denialism—while admitting the truth in their internal documents. These corporations are working to accelerate the extraction and production of fossil fuels, including the dirtiest, most greenhouse gas-generating varieties, reaping enormous profits in the process. The melting of the Arctic ice from global warming is seen by capital as a new El Dorado, opening up massive additional oil and gas reserves to be exploited without regard to the consequences for the earth’s climate. In response to scientific reports on climate change, Exxon Mobil declared that it intends to extract and sell all of the fossil-fuel reserves at its disposal.41 Energy corporations continue to intervene in climate negotiations to ensure that any agreements to limit carbon emissions are defanged. Capitalist countries across the board are putting the accumulation of wealth for a few above combatting climate destabilization, threatening the very future of humanity. Capitalism is best understood as a competitive class-based mode of production and exchange geared to the accumulation of capital through the exploitation of workers’ labor power and the private appropriation of surplus value (value generated beyond the costs of the workers’ own reproduction). The mode of economic accounting intrinsic to capitalism designates as a value-generating good or service anything that passes through the market and therefore produces income. It follows that the greater part of the social and environmental costs of production outside the market are excluded in this form of valuation and are treated as mere negative “externalities,” unrelated to the capitalist economy itself—whether in terms of the shortening and degradation of human life or the destruction of the natural environment. As environmental economist K. William Kapp stated, “capitalism must be regarded as an economy of unpaid costs.”42 We have now reached a point in the twenty-first century in which the externalities of this irrational system, such as the costs of war, the depletion of natural resources, the waste of human lives, and the disruption of the planetary environment, now far exceed any future economic benefits that capitalism offers to society as a whole. The accumulation of capital and the amassing of wealth are increasingly occurring at the expense of an irrevocable rift in the social and environmental conditions governing human life on earth.43

## Contention 2 – Grid Collapse

#### Private space development wrecks cyber security

Lospinoso, January 13, 2022, Josh Lospinoso is an ex-Army sergeant and Oxford-educated cybersecurity expert who is CEO and co-founder of Shift5, which protects planes, trains and tanks from cyber threats, Space race needs better cybersecurity, https://thehill.com/opinion/cybersecurity/589542-space-race-needs-better-cybersecurity

**The rise in satellites, rockets and shuttles is creating an expanded attack surface. Just like transportation, energy, and other vital industries,** space systems need protection. And while we probably won’t see civilians launching into space anytime soon, Blue Origin and Virgin Galactic are making such travel more feasible by the day. A proposed bill in the U.S. House of Representatives — the Space Infrastructure Act — would designate space as a critical infrastructure sector. It would be a good first step. Given how much equipment is in space and how dependent we are on it, it makes sense to classify it as critical infrastructure. There are more than 6,500 satellites in orbit; a record 1,283 launched in 2020 alone**. They are integral to cellular communications, Global Positioning System (GPS) navigation, monitoring weather and climate**, managing Internet of Things systems for agriculture, and keeping energy and other critical infrastructure running. And this infrastructure is disconcertingly fragile. **Outages have widespread, cascading, and potentially catastrophic consequences. One disabled satellite can affect vast networks on earth, leaving regions without cellular and other services.** ***This makes them attractive targets for malicious attackers***. The risk is so great that the director of the Defense Department’s Space Development Agency has cited cyber attacks against satellites as a greater threat than missiles. The threat is not theoretical Attacks have been going on for many years and have recently ramped up. In 2018, hackers infected U.S. computers that control satellites. Iranian hacking groups tried to trick satellite companies into installing malware in 2019. And one report concluded that Russia has been hacking the global navigation satellite system (GNSS) and sending spoofed navigation data to thousands of ships, throwing them off course**. While there haven’t been any public reports of direct hacks on satellites, vulnerabilities in ground stations have been exploited to try to alter satellite flight paths**, among other aims. **There are a number of ways satellites can be attacked. Hackers could compromise ground control systems to take control of space equipment remotely or inject malware into communications between terrestrial computers and satellites. They can spoof, or snoop on communications for espionage purposes, or disrupt signals.** Imagine a weather data outage during a hurricane or data glitches that lead to power blackouts or supply chain delays. The economic costs would be vast. A cyber attack on the Global Positioning System alone could cost the U.S. $1 billion a day, according to Brian Scott, director of critical infrastructure cybersecurity for the National Security Council. Federal initiatives are a good starting point Lawmakers in Washington, D.C., are taking notice of this fast-growing threat. The 2020 National Defense Authorization Act established a new military branch — Space Force. Meanwhile, President Biden is reviewing the first comprehensive cybersecurity policy for space systems, dubbed Space Policy Directive 5. It requires capabilities to prevent jamming and spoofing of communications and unauthorized access of equipment in orbit. The Space Infrastructure Act, proposed by U.S. Reps. Ted Lieu (D-Calif.) and Ken Calvert (R-Calif.) this summer, is another key measure that would put space on par with other industries by classifying it as a critical infrastructure domain. This move would enable more private and public collaboration on cybersecurity for space assets. One critical infrastructure sector that has dealt with similar cybersecurity concerns is transportation. Transportation operators that have invested in IT security measures have taken first steps, but efforts are on the rise to bolster proactive risk management that demonstrate a more complete understanding of infrastructure security. Under DHS Secretary Alejandro Mayorkas, the TSA has introduced regulations that urge operators to appoint a cybersecurity coordinator, report incidents to CISA within 24 hours, complete vulnerability assessments within information technology (IT) and operational technology (OT) systems, and develop an incident response plan based on security issues discovered. Another critical infrastructure that has work to do is the U.S. military. The Government Accountability Office released reports in 2018 and 2021 chiding the DOD for the poor to non-existent cybersecurity protection on its most critical fleet assets, ranging from fighter jets to tanks to aircraft carriers. These systems were never designed with cybersecurity requirements. As these systems have become more networked and interconnected, the DOD has an enormous, latent problem on its hands that it’s only beginning to grapple with. Fix the technology gaps. Satellite systems were not designed with security in mind. They have weak encryption and use legacy systems that are not easily patched or updated. And some of the navigation protocols are broken — I’ve built systems that spoof some of those protocols and discovered that it’s pretty trivial to do so with a few thousand dollars of investment. Traditional IT security solutions don’t protect the OT layers that satellites rely on. These security lapses make satellites vulnerable to hacking. Learn from IT security. Securing space assets is achievable, especially if we lean on the decades of hard lessons in securing IT networks. These include basics such as setting best practices like understanding your assets and observing what’s happening there to help detect attacks. Vendors should harden the code running on space systems and use the principle of least privilege for accessing the systems. These same lessons have been applied to transportation OT systems successfully. It shouldn’t take as long to get there with space systems. Agree on standards. This includes establishing reasonable security measures and sharing threat information, as well as developing a common cybersecurity architecture. The U.S. is in the early stages of devising cybersecurity rules for other critical infrastructure — like freight and passenger rail systems — and should get started with space now too. Realign incentives. Vendors and customers need more motivation to adopt risk mitigation approaches. When critical infrastructure goes out of service, millions of people can be affected. The total economic loss from these outages is orders of magnitude higher than the expenses incurred by the infrastructure operator. For example, Colonial Pipeline paid a $6.5 million ransom to get their gas pipelines flowing again, but that pales in comparison to the net effect of millions of people on the eastern seaboard who couldn’t pump gas. After the attack, we saw efforts from the U.S. government to apply regulations regarding breach reporting for pipeline systems, and we’re seeing similar efforts in the transportation sector. Federal regulations and the risk of bottom-line impact compel most companies to improve cybersecurity practices — which would benefit space technology as well. W***ith SpaceX, Amazon, and others launching new satellites weekly and commercial space travel on the horizon, the stakes will only get higher if we don’t work to secure these systems.*** Satellites aren’t just communication equipment; they are infrastructure we rely on to keep our hospitals open, streets lit, internet on, food delivered and emergency systems working. It’s time to make security for these systems a national priority before a disaster strikes.

#### Grid vulnerability risks cascading systems collapse

**CNA** Military Advisory Board, advisory group of retired flag and general officers from the

Army, Navy, Air Force, and Marine Corps, November, 20**15**, National Security and

Assured U.S. Electrical Power, https://www.cna.org/CNA\_files/PDF/National-Security-Assured-Electrical-Power.pdf

A Stacked Deck: Grid Susceptibility and Heightened Threats

Today’s grid is built on the model that power comes from large stationary power-generation facilities, flows through hundreds of thousands of miles of transmission lines and high-voltage transformers, and finally reaches consumers (see Figure 1).1

As the grid has evolved incrementally to meet the needs of our growing and increasingly urban population, power plants have grown in size and distance from consumers, and they have decreased in number [3]. Today’s grid—actually comprising three grids: the Eastern, Western, and Texas Interconnects—is rigid. It is designed for power to flow in one direction. It has little flexibility and many vulnerable points of failure that can result in the collapse of large segments. Within the transmission portion of the grid, there are 55,000 transmission substations,2 and according to a Federal Energy Regulatory Commission study, the loss of just nine of these nodes could result in a regional or nationwide outage that could last for weeks or possibly months, with restoration delayed by lack of available replacements [6]. Power utilities are prepared to address events that take one or even two transformers offline, but a natural disaster or coordinated attack that severely damages or fully disables more than two transformers could result in cascading blackouts [8]. No federal rules require utilities to protect these substations unless they are connected to nuclear power plants.

In our 2009 report, Powering America’s Defense: Energy and the Risks to National Security [9], we linked the vulnerability of the fragile domestic electricity grid to weather, accidents, and attacks, with the associated impacts on military installations. In the six years since the release of the report, the risks associated with attacks—such as those by transnational terrorist groups (e.g., al Qaeda, ISIL/ISIS), adversarial governments, and “lonewolf” perpetrators, as well as cyberattacks—have increased dramatically. Several recent incidents give us growing cause for concern, since they may be precursors of future threats.

Physical attacks

The design of the grid and its inherent vulnerabilities are known to our enemies—foreign and domestic. In 2013, the Pacific Gas and Electric (PG&E) Metcalf Transmission Substation located outside San Jose, CA, was the target of a sophisticated sniper attack. The Metcalf Substation supplies power to Silicon Valley, an American landmark of innovation. During the attack, gunmen fired on and disabled 17 transformers, causing $15 million worth of damage. The attackers have not been apprehended and their ultimate purpose remains unknown. The Federal Bureau of Investigation ruled out terrorism, but various independent investigations of the attack have pointed to its high degree of “sophistication.” Some investigators concluded that the Metcalf Substation incident was a “dress rehearsal” for other attacks on a much larger portion of the grid [10] [11].

Although the Metcalf incident was one of the most coordinated attacks on a substation to date, attacks on substations are not isolated. In 2013, shots were fired at grid infrastructure in eastern Colorado, while two years earlier an individual broke into a critical hydro-electric converter station in Vermont with threatening intent. The individuals involved in all of these incidents remain at large [12].

#### Causes extinction

**Friedemann 16** [Alice. Transportation expert, founder of EnergySkeptic.com and author of “When Trucks Stop Running, Energy and the Future of Transportation,” worked at American Presidential Lines for 22 years, where she developed computer systems to coordinate the transit of cargo between ships, rail, trucks, and consumers, Jan 24, 2016, “Electromagnetic pulse threat to infrastructure (U.S. House hearings),” Energy Skeptic, http://energyskeptic.com/2016/the-scariest-u-s-house-session-ever-electromagnetic-pulse-and-the-fall-of-civilization]

Modern civilization cannot exist for a protracted period without electricity. Within days of a blackout across the U.S., a blackout that could encompass the entire planet, emergency generators would run out of fuel, telecommunications would cease as would transportation due to gridlock, and eventually no fuel. Cities would have no running water and soon, within a few days, exhaust their food supplies. Police, Fire, Emergency Services and hospitals cannot long operate in a blackout. Government and Industry also need electricity in order to operate. The EMP Commission warns that a natural or nuclear EMP event, given current unpreparedness, would likely result in societal collapse.

#### AND nuclear lashout

**Tilford 12** [Robert Tilford, Writer for The Examiner, July 27, 2012, “Cyber Attackers Could Easily Shut Down the Electric Grid for the Entire East Coast,” http://www.examiner.com/article/cyber-attackers-could-easily-shut-down-the-electric-grid-for-the-entire-east-coa]

“Cyber attackers could all too easily shut down the electric grid for the entire east coast, the west coast, and the middle part of our country”, said Senator Grassley on July 26, 2012. “Any one attack could leave dozens of major cities and tens of millions of Americans without power. We know, because we were shown in a room here in the Capitol, how an attack could take place and what damage it would do, so we know this is not just make believe”, he said. So what would a cyber attack look like anyway? The Senator explained: “Without ATMs or debit card readers, commerce would immediately grind to a halt. My daughter, who lives here in the DC area, lost power when the storm hit. They waited for a number of hours, and then they took all the food out of their freezer, they gave away what they could, and they threw the rest away. And that was the way it was all over. Their power was out for about a week, and it made it very difficult. They are fortunate enough to have a basement, and the heat wasn’t oppressive down there. Without refrigeration, food would rot on the shelves, the freezers would have to be emptied, and people could actually go hungry. Without gas pumps, transportation arteries would clog with abandoned vehicles. Without cell phones or computers, whole regions of the country would be cut off from communication and families would be unable to reach each other. Without air conditioning and without lifesaving technology and the service of hospitals and nursing homes, the elderly and sick would become much sicker and die. Most major hospitals have backup power, but it is only for a limited amount of time. It depends on how much fuel they can store, and that is very limited”, Senator Grassley said. The devastation that the Senator describes is truly unimaginable. To make matters worse a cyber attack that can take out a civilian power grid, for example could also ~~cripple~~ harm the U.S. military. The senator notes that is that the same power grids that supply cities and towns, stores and gas stations, cell towers and heart monitors also power “every military base in our country.” “Although bases would be prepared to weather a short power outage with backup diesel generators, within hours, not days, fuel supplies would run out”, he said. Which means military command and control centers could go dark. Radar systems that detect air threats to our country would shut Down completely. “Communication between commanders and their troops would also go silent. And many weapons systems would be left without either fuel or electric power”, said Senator Grassley. “So in a few short hours or days, the mightiest military in the world would be left scrambling to maintain base functions”, he said. We contacted the Pentagon and officials confirmed the threat of a cyber attack is something very real. Top national security officials—including the Chairman of the Joint Chiefs, the Director of the National Security Agency, the Secretary of Defense, and the CIA Director— have said, “preventing a cyber attack and improving the nation’s electric grids is among the most urgent priorities of our country” (source: Congressional Record). So how serious is the Pentagon taking all this? Enough to start, or end a war over it, for sure (see video: Pentagon declares war on cyber attacks http://www.youtube.com/watch?v=\_kVQrp\_D0kY&feature=relmfu ). A cyber attack today against the US could very well be seen as an “Act of War” and could be met with a “full scale” US military response. That could include the use of “nuclear weapons”, if authorized by the President.

## Underview

#### The role of the ballot is to evaluate whether the resolution claim is true or false – anything else is arbitrary and moots half of the Aff’s speech time – the 1AR is too short to readjust

#### I get new 1AR theory – anything else allows infinite unchecked abuse in the NC and the NR is long enough to answer any theory

# 1NC

### Intro

#### As Senator Bill Frist once said, “Space offers extraordinary potential for commerce and adventure, for new innovations and new tests of will. As Americans, we can't help but reach for the stars. It's our nature. It's our destiny.” In line with these words, I negate the resolution. Resolved: The appropriation of outer space by private entities is unjust.

### Definitions

#### To begin, we will need to define some terms of importance within the resolution.

(If they already read definitions that align with these, don’t read ours. Instead, say “I agree with the definition the affirmative has provided for the resolution”)

### Definitions

#### To begin, we will need to define some terms of importance within the resolution.

#### First, appropriation, according to the Collins Dictionary, is defined as

Collins Dictionary., No Date "Appropriation definition and meaning," No Publication, <https://www.collinsdictionary.com/us/dictionary/english/appropriation> ///AS

Appropriation of something that belongs to someone else is the act of taking it, usually without having the right to do so.

#### Second, Law Insider defines private entities as

Law Insider, No Date, "Private entities Definition," <https://www.lawinsider.com/dictionary/private-entities> ///AS

Private entities means individuals or organizations other than federal, state, or local personnel or agencies.

#### Finally, unjust is defined by Merriam Webster as

Injustice, No Date, “Definition of Unjust”, No Publication, <https://www.merriam-webster.com/dictionary/unjust> ///AS

1: characterized by injustice : UNFAIR

2archaic : DISHONEST, FAITHLESS

#### I would also like to make one observation about the resolution before we address its substance. The burden of the affirmative is show that states have the obligation, willingness, and capability to stop the appropriation of outer space by private entities, as this would indicate you would expect it to be true or to happen.

### Value

#### Let’s move on to the value debate.

#### My value for today’s debate is security.

Security is defined by Rothschild in 1995 as Emma Rothschild is director of the Centre for History and Economics at King's College. "What is Security?" https://www-jstor-org.ezproxy.lib.utah.edu/stable/pdf/20027310.pdf?refreqid=excelsior%3A02230441d546cbd2c47bf432fdc2bad5///AS

The idea of security has been at the heart of European political thought since the crises of the seventeenth century. It is also an idea whose political significance, like the senses of the word "secu rity," has changed continually over time. The permissive or plural istic understanding of security, as an objective of individuals and groups as well as of states? the understanding that has been claimed in the 1990s by the proponents of extended security?was charac teristic, in general, of the period from the mid-seventeenth century to the French Revolution. The principally military sense of the word "security," in which **security is an objective of states, to be achieved by diplomatic or military policies, was by contrast an innovation**, in much of Europe, of the epoch of the Revolutionary and Napoleonic Wars. But security was seen throughout the pe riod as a condition both of individuals and of states. Its most consistent sense?and the sense that is most suggestive for modern international politics?was indeed of a condition, or an objective, that constituted a relationship between individuals and states or societies. "My definition of the State," Leibniz wrote in 1705, "or of what the Latins call Respublica is: that it is a great society of which the object is common security (ela seuret? commune')."24 For Montesquieu, security was a term in the definition of the state, and also in the definition of freedom: "political freedom consists in security, or at least in the opinion which one has of one's security."25 **Security, here, is an objective of individuals**. It is some thing in whose interest individuals are prepared to give up other goods. It is a good that depends on individual sentiments?the opinion one has of one's security?and that in turn makes possible other sentiments, including the disposition of individuals to take risks, or to plan for the future. The understanding of **security as an individual good**, which persisted throughout the liberal thought of the eighteenth century, reflected earlier political ideas. The Latin noun "securitas" re ferred, in its primary classical use, to a condition of individuals, of a particularly inner sort. It denoted composure, tranquillity of spirit, freedom from care, the condition that Cicero called the "object of supreme desire," or "the absence of anxiety upon which the happy life depends." One of the principal synonyms for "securitas," in the Lexicon Taciteum, is "Sicherheitsgef?hl": the feeling of being secure.26 The word later assumed a different and opposed meaning, still in relation to the inner condition of the spirit: it denoted not freedom from care but carelessness or negli gence. Adam Smith, in the Theory of Moral Sentiments, used the word "security" in Cicero's or Seneca's sense, of the superiority to suffering that the wise man can find within himself. In the Wealth of Nations, security is less of an inner condition, but it is still a condition of individuals. Smith indeed identifies "the liberty and security of individuals" as the most important prerequisites for the development of public opulence; **security is understood, here, as freedom from the prospect of a sudden or violent attack on one's person or property.**27 It is in this sense the object of expenditure on justice, and of civil government itself.28 There is no reference to security, by contrast, in Smith's discussion of expenditure on de fense ("the first duty of the sovereign, that of protecting the society from the violence and invasion of other independent soci eties").29 The only security mentioned is that of the sovereign or magistrate as an individual, or what would now be described as the internal security of the state: Smith argues that if a sovereign has a standing army to protect himself against popular discontent, then he will feel himself to be in a condition of "security" such that he can permit his subjects considerable liberty of political "remonstrance."30

#### My value of security is a prerequisite to any other value. If you are never free, secure, and protected, it becomes less important to worry or care about anything else. Because space exploration and appropriation will lead to increased safety for everyone, it is just.

### Value Criterion

#### Next let’s move on to my value criterion, the lens through which you evaluate my value. My value criterion for today’s debate is cosmopolitanism.

#### Oxford defines cosmopolitanism as

Delanty 04-07- 20, "Cosmopolitanism," obo, https://www.oxfordbibliographies.com/view/document/obo-9780199756384/obo-9780199756384-0133.xml

The term cosmopolitanism derives from the Greek word kosmopolites, meaning “a citizen of the world.” It was first used by the Cynics and later the Stoics, who used it to identify people as belonging to two distinct communities: the local and the wider “common.” This understanding of cosmopolitanism denotes only one of its meanings. Its conception nowadays is broad, and no single definition is sufficient to embrace all its meanings. A distinction can be drawn between moral and political cosmopolitanism; cosmopolitanism can be understood as a perspective on global justice and as a concept within which the discourse on human rights and theory of justice takes place. Cosmopolitanism can also be understood as an ethical stance, in which individuals engage with others in dialogue and understanding in order to move beyond parochialism. It is also increasingly seen as expressed in cultural phenomena, as in lifestyles and identities. Cosmopolitanism is a normative viewpoint from which one experiences, understands, and judges the world, and it is also a condition in which laws, institutions, and practices defined as such are being established.

#### Cosmopolitanism must come before INSERT AFFIRMATIVE VALUE because it priorities human rights and global justice. It is impossible to create a INSERT AFFIRMATIVE VALUE situation if we don’t consider the impact ending outer space appropriation will have on the globe. With that, let’s move on to my contention.

### Contention 1

#### Contention 1: Climate Change

#### Satellite imagery created by private companies is key to fighting climate change

Aditya Chaturvedi, 1-30-2020, "How satellite imagery is crucial for monitoring climate change," Geospatial World, https://www.geospatialworld.net/blogs/satellites-for-monitoring-climate-change/

“If you can’t measure it, you can’t manage it”, said María Fernanda Espinosa Garcés, President of the United Nations General Assembly at the COP 24 in Katowice Poland, summing up how crucial satellites are for measuring climate change. Satellite measurements of Earth’s temperature, greenhouse gas emissions, sea levels, atmospheric gases, dwindling ice and forest cover etc, are essential for improving the understanding of Climate change and predicting future of the Earth. Innovation such as miniaturization of sensors, high-speed data transfer, and upgraded storage capabilities have made satellites an integral part of the climate change mission. It is simply inconceivable to assess climate change sans insights provided by satellites. Without precise data and other inputs provided by satellites, environmentalists and scientists won’t be able to understand, analyze and predict the impact of climate change, and policymakers won’t be able to formulate effective strategies. Using an array of satellites, organizations like NASA, NOAA and ESA monitors ocean conditions, clouds, temperature, sea levels and heat content, to get information on how fast Earth’s temperature is changing. ESA map shows ocean salinity Satellite data provides authoritative information about more than half of the 50 crucial climate change variables. These insights include satellite radar altimetry, which measures distance between a satellite and the earth’s surface and gives us precise information about sea levels. Atmospheric chemical composition and greenhouses gases like Methane are also measured using satellites. Currently, there are around 162 satellites in-orbit that measure the various indicators related to climate change. New generation satellites have enhanced optical and temporal resolutions that have improved weather forecasting, climate modeling and the ability to obtain real-time details. Within the next five years, many new satellite missions will be launched, including Eumetsat’s second-generation polar-orbiting satellites, third-generation Meteosats and Chinese satellites. Dwindling ice covers Though there are programs to monitor at both the poles, the biggest news came in 2017 when a huge iceberg broke away from the Antarctica landmass. This changed the map of the world forever. Satellite data is crucial for systematic monitoring of ice sheet volume change, mass balance, and sea-level rise. The first study on change in Antarctic ice sheet patterns used data from Copernicus Sentinel-3 Delay-Doppler altimeter. Declining ice cover also leads to rise in sea levels. Satellite imagery shows the decrease in ice caps in Antarctica. In Greenland, the ice sheet is melting six times faster as compared to 1980s. The Sentinel-3 mission is mainly for applications for the ocean and coastal monitoring, numerical weather and ocean prediction, sea-level change and sea-surface topography monitoring, ocean primary production estimation and land-cover change mapping. Copernicus Sentinel-3 maps Antarctic Ice Sheet elevation change NASA satellites ASTER and Landsat are used to track a decrease in ice caps and level of glacial melting. The series of images by these satellites help scientists map changes in polar ice caps over time. Copernicus Sentinel-3, Gravity Recovery and Climate Experiment Follow-On (GRACE-FO) and the ICESat-2, provide information about vanishing ice caps in the two polar regions of the Earth. Sea ice of different thickness and bumpiness is broken up by the cracks between floes, called leads, in this graph of photon returns from ICESat-2 as it orbits over the Weddell Sea in Antarctica. Image Courtesy: NASA Earth Observatory/Joshua Stevens Launched in September 2018, NASA IceSat-2 is the most sophisticated satellite for measuring ice. It points six laser beams at ice sheets in the Arctic and Antarctic regions. Pinpointing emissions and pollution Copernicus Sentinel-5P, launched by ESA (European Space Agency) in October 2017, is said to be the most advanced pollution monitoring satellite in the world. It tracks carbon monoxide, nitrogen dioxide, and ozone, along with aerosol. It also monitors formaldehyde, which is one of the sources of carbon monoxide. Sentinel-5P image shoes NO2 concenteration worldwide In January 2009, Japan launched the world’s first satellite dedicated to greenhouse monitoring — Greenhouse Gases Observing Satellite (GOSAT). It measures CO2 and methane densities from 56,000 locations around the world. In October last year, the Japan Aerospace Exploration Agency (JAXA) launched GOSAT-2 to generate even more precise data. By early 2020, US is scheduled to launch the Geostationary Carbon Observatory (GeoCarb) to track global carbon cycle from a geostationary orbit, making it the first NASA satellite to measure methane near Earth’s surface. GeoCarb will gather 10 million daily observations of the concentrations of carbon dioxide, methane, and carbon monoxide. Deforestation Deforestation is among the leading causes of global warming, accounting for around a quarter of global greenhouse gas emissions. As per researchers, deforestation in tropical rainforests produces more carbon dioxide than most vehicles in the world. In countries like Brazil and Indonesia, depleting forest cover is the main reason for greenhouse emissions. NASA satellite imagery showing deforestation in Brazil The state of Rondônia in western Brazil, which was once home to 208,000 square kilometers of forest (about 51.4 million acres), an area slightly smaller than the state of Kansas, now has become one of the most deforested parts of the Amazon, according to the NASA Earth Observatory. Ocean pollution satellites for climate change NASA’s Landsat-8 satellite image showing pollutants and organic matter flowing into the Atlantic Ocean Oceans too are bearing the brunt of human activities and water pollution is leading to the death of many aquatic species. Satellites are used to monitor the discharge of plastic in the ocean. It is estimated that around eight million tonnes of plastic is dumped into the sea every year. Satellite imagery shows the havoc unleashed by plastic dumping. Coral Reefs Coral reefs support the most extensive biodiversity of any ecosystem globally and support close to 5OO million people in poor countries. Around 25% of marine life is supported by coral reefs but in the past 30 years, more than half of the world’s corals have been destroyed. It is being estimated that going by the current alarming rate, more than 90% of the world’s corals will cease to exist in the next 50 years NOAA Coral Reef Watch Coral Reefs are threatened due to massive global warming and greenhouse gas emissions. As per UNESCO, coral reefs in World Heritage sites would disappear by the end of the century. Satellite imagery shows the extent of coral reef bleaching. Desertification NASA imagery showing desertification in Mali Desertification is a type of degradation of land due to which land becomes more arid. Global warming is increasingly leading to desertification. Each year around 12 million hectares of productive land become barren every year due to desertification and drought alone according to UNCCD. Satellite imagery shows the extent of desertification. TAGSCLIMATE CHANGESPACE & EARTH OBSERVATION

#### And, even the development of that space technology is key to solving climate change

Dylan Taylor 20 is chairman and CEO of Voyager Space Holdings and is the founder of Space for Humanity. He is also co-founding patron of the Commercial Spaceflight Federation. He has been featured in CNBC, Fox Business, Bloomberg News, SpaceNews, ROOM, The Space Review and Apogeo Spatial. He contributed this article to Space.com's Expert Voices: Op-Ed & Insights.

Some people are baffled as to why we spend so much time and money developing spacecraft and technologies that will launch us into space and help us explore distant planets while, at home on Earth, we already have pressing challenges in need of solutions. Each year, we spend billions of dollars on developing space technologies. The 2020 budget for NASA alone is over $20 billion. Many people may not recognize that the development of space exploration technologies has already helped benefit Earth in many ways, especially when it comes to communications, Earth observation and even fostering economic growth. Space technologies are surprisingly critical in impacting government, industry and personal daily decision-making. However, with more planetary-wide troubles such as climate change, humanitarian crises, mass migration and others on the horizon, how effectively can we rely on space technologies to sustain our own Earth and life on it? Related: Earth quiz: Do you really know your planet Click here for more Space.com videos...Combating climate change Climate change is altering environments across the globe, causing harsh superstorms and weather patterns that are an ever-increasing threat to the sustainability of life on Earth. However, space satellites can do much more than simply predict daily weather forecasts. Space systems can save thousands of lives from extreme weather each year. Before satellite technology, major disaster incidents like the 1900 Galveston, Texas, hurricane killed from 6,000 to 12,000 people because there were no early-warning systems allowing people to get out of harm's way. NASA's satellite data was the first to reveal a massive hole in the ozone layer over the South Pole. Just over a decade ago, we weren't yet using weather apps or online mapping applications to get to where we're going in efficient ways. Earth-observation satellites monitor greenhouse gases and other climate indicators, while also allowing us to analyze Earth's ecosystem health more effectively. For example, technologies adapted from space use, like GPS and semiconductor solar cells, have dramatically reduced greenhouse gas emissions. GPS navigation reduces fuel use on sea, land and in the air by up to 15 to 21 percent, which is more than what more efficient engines or fuel changes have offered. Solar photovoltaic power, which was first used by NASA on projects like the International Space Station, has led to massive improvements in solar energy performance. In the future, orbital space power stations could continuously send down clean power day or night through targeted radiation, whatever weather conditions on Earth may be. Free from atmospheric events, solar power would be more efficient than current solar technology. Additionally, sending solar power generation to space would free up land and cultural resources from huge panel arrays, and it would also save landfills from discarded solar panel waste. Climate change's impact is also harming agriculture production, fisheries management, freshwater sources and forestry. Earth-observation satellites, however, allow us to track, monitor and identify environmentally harmful activities like illegal logging, animal poaching, fires and mining. The closer we monitor these incidents, the better we can offer early and immediate action to help stop these events. Without these systems in place, we would have no way to assess and deal with climate change in a scientific capacity. Related: The effects of global warming Click here for more Space.com videos... Confronting humanitarian crises Not only can using space observations help protect society from climate change, but it can also improve society in the commercial, public health and national safety sectors. World hunger, for instance, is one of the leading humanitarian crises in the world. But satellite imagery can identify crop yield through a magnified view of each pixel, allowing farmers to understand when to water, fertilize and harvest crops. Imaging the land using special spectral bands like near infrared, we can create a vegetation index that represents crop yield productivity. And satellites are uniquely able to capture and collect data on agricultural areas, which make up 37 percent of Earth's landmass. What's more, big data applications of space technology are instrumental to developing nations, which are especially susceptible to natural disasters due to their limited resources. The United Nations Office for Outer Space Affairs (UNOOSA) even has a platform for space-based information for disaster management and emergency response (UN-SPIDER), which uses big data and satellite technology to respond to natural disasters in African countries. With an increasing amount of data from Earth-observation tech, social media, crowdsourced geolocation, virtual tools and internet access, big data can help generate insights that allow us to make better decisions in emergencies while sticking to sustainability goals.

#### Only by looking through the lens of cosmopolitanism and prioritizing human rights around the globe can we achieve the value of security. That means that we must prioritize climate saving initiatives that can only occur when we continue to explore and use outer space. Because the affirmative neglects to recognize this, they can never achieve their value of INSERT AFFIRMATIVE VALUE. That means you vote negative because we can achieve a secure world.

### AT Value

#### Theirs is bad

#### Ours is better

#### They can’t achieve theirs

#### Ours is a prerequisite

### AT VC

#### Theirs is bad

#### Theirs fails to achieve their value

#### Ours is better

#### Ours achieve theirs better

#### Ours is the best lens

### AT Contentions

#### Theirs is makes no sense

#### Theirs fails to prove their value

#### Theirs fails to prove their V/C