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INTRODUCTION

China's main space policy goal is to usurp the United States' leadership position in space by 2045 — and it increasingly looks like a goal they'll meet. This development would have dire implications for America's national security, global position, and economic growth. Indeed, the Office of the Director of National Intelligence has stated, "Chinese space activities will increasingly erode the national security, commercial, and global influence advantages that the United States has accrued from its leadership in space."

This erosion of American leadership could occur in the next five years as China is on track to reach parity with United States space power in most areas by 2030.[1] In some areas, like positioning, navigation, and timing (the American Global Positioning Service, for instance), China already has superior capabilities.[2] However, in most areas, like low-Earth orbit satellite broadband service and rendezvous and proximity operations, China still lags the United States, though China is working expeditiously to change that status quo.

Yet, Congress has not yet taken substantial action to address this, nor did the Biden administration. There were a number of pieces of space legislation introduced last Congress, but there was only one bill that passed into law that addresses this issue and it was narrowly focused. Space has a long-standing reputation for having strong bipartisan support. Yet we are seeing Republicans double down on their support for the sector while Democrats have gone quiet and focused on maintaining the status quo rather than encouraging the exciting innovations in this arena. The Trump administration firings have touched NASA, but to date, they have been glancing blows rather than the sucker punches experienced by other agencies.[3] That said, while it remains to be seen how Trump's tariffs on items like aluminum that are vital to the space industry, potential plans to slash NASA's budget 20% and fights with nations that are traditional United States partners

will play out for space, the impact is unlikely to be positive. Democrats must start to show up to the conversation and push for change via thoughtful, pragmatic solutions if the nation is to maintain competitiveness in the space domain.

There is still time to take action to invest in U.S. competitiveness and maintain American space leadership. This report will outline why space leadership matters to the nation, the state of play for strategically significant space capabilities, and recommend solutions for turning things around. These solutions must be undertaken in tandem as there is not a silver bullet. Experts believe China's space investments may have already surpassed the United States' when adjusted for purchasing power parity, though given the general opacity of Chinese government spending estimates that exact figure varies.[4] Increased investment in targeted portions of American space programs remains vital, but more money alone won't be enough. We must:

- Maintain stability in existing space programs and make additional investments that will help us go further and faster — both today and into the future;
- Enact regulatory reforms to minimize the number and duration of steps space companies need to take to get authorization for their activities without sacrificing crucial national priorities like the safety of the uninvolved public;
- Continue American international engagement and partnering with other nations; and
- Harness the private sector as efficiently as possible, which is vital to American success in space.

WHAT ARE THE IMPLICATIONS OF SPACE LEADERSHIP?

Sputnik, the Soviet Union, and the Apollo Moon landings typically come to mind when Americans hear the term "space race." But what's often forgotten is why the country fought so hard for space superiority during the Cold War, many of which mirror our motivations today. Space leadership is vital to American national security, international influence, and economic growth as well as the environment and global climate.

National Security

Space is the ultimate high ground.

Just as medieval forts were often built on hills and air superiority proved crucial to Allied victory in World War II, space serves as the strategically significant high ground of modern warfare. As former assistant secretary of defense for space policy John Plumb put it:

> **"For the Department of Defense space is essential to how we compete and fight in every domain. It provides us with a missile warning and missile tracking critical to defending our homeland. It provides position navigation and timing to strike targets with precision. And it provides communication in austere environments to support global command and control. To put it simply, space-based missions are essential to the U.S. way of war."[5]**

The intelligence community has long valued space-based capabilities as well, as evidenced by the fact the National Reconnaissance Office alone has launched over 150 satellites in the past two years.[6]

While most national security assets in space to date have been designed to support ground operations, the Space Force is now pushing to develop "offensive" capabilities that would allow

for the service to wage war in the space arena itself.[7] This postural shift has been prompted by the advancing capabilities of other nations, which pose an increased threat to American space assets. The most visible and extreme example of this is the Russian nuclear antisatellite weapon that could disable or destroy satellites with a nuclear explosion and may also cut off access to a portion of Earth's orbit for a period of time given the resulting space debris,[8] but there are any number of concerning counterspace weapons in development.[9] The offensive capabilities the Space Force is looking to develop could include jamming devices that temporarily disable satellites, cyberattacks to permanently take satellites offline, or grappling devices that deorbit other satellites, though the exact capabilities the Space Force is seeking have not been disclosed given the sensitivity of this information.[10]

Economic Security

The global space economy is already worth hundreds of billions of dollars — and is expected to be worth $1.8 trillion by 2035.[11] Nations around the globe will be looking to secure their slice of the pie. Given the dual use potential of many space capabilities, though, there will be an economic advantage for the nation that manages to lead in this domain because of export controls that limit the global sharing of items that have military significance. The United States has been the global leader in space for decades, but that position is not guaranteed as other countries step up their investments.

Beyond its direct contribution to GDP growth, space jobs are disproportionately high-paying[12] and the sector relies on a robust industrial base across the country.[13] This contributes to the economic spillover effect of space — or, put more simply, "space expenditure policies can provide substantial financial gains"[14] that go beyond the field. NASA's overall economic impact in FY23 was $75.6 billion despite its budget of $25.4 billion — and the agency has estimated that for every full-time NASA employee, at least 16 additional American jobs are supported.[15]

NASA spin-offs add to the economy as well. These are breakthroughs made for the space program that have terrestrial uses. This includes everything from memory foam mattresses to cochlear implants that restore the ability to hear for hearing impaired people to the technology cell phone cameras rely on and beyond.[16] The exact economic impact of these discoveries has not been quantified, but NASA spin-offs have created or revolutionized a variety of industries.

The inspiration effect for science, technology, engineering, and math (STEM) fields also cannot be overstated. According to NASA, "there was a dramatic increase in the number of U.S.-citizen students pursuing advanced degrees in STEM disciplines" during Apollo.[17] While a spike in STEM interest does not equate to an immediate spike in GDP, it does boost the economy in the long term.

International Influence

Space has long been a source of soft power and international influence. This isn't just theoretical — the State Department has published a strategic framework for space diplomacy that outlines how they use space diplomacy to enhance our international relationships.[18] The United States uses partnerships in carrying out space missions as well as opportunities to share the benefits of space assets for climate or other applications.

Beyond formal partnerships, the NASA logo can often be spotted around the world on t-shirts, backpacks, and in coffee shops because of its overwhelmingly positive association. Charles Bolden, former NASA Administrator under President Obama, has called NASA "the greatest soft power that the country has," and notes it has

been that way since the agency's inception.[19] These products do not financially benefit the agency, but they are beacons of American cultural influence internationally.

Climate

The World Economic Forum found that 50% of climate variables can only be observed from space.[20] Accordingly, space is vital to understanding weather patterns as well as climate change. This understanding will only become more crucial as resources like water and arable land become scarcer as the planet warms.[21]

Beyond that, the nation that leads in space capabilities is likely to be able to influence the main source of fuel used by launch vehicles. This sounds dull until you realize that the solid rocket boosters used by China are known to be worse for the ozone layer, which filters out much of the Sun's harmful ultraviolet radiation, than the liquid versions primarily used in the United States.[22]

HOW DOES THE UNITED STATES STACK UP AGAINST CHINA IN SPACE?

The United States is still the global leader in space, but China is rapidly catching up and starting to overtake the United States in certain areas like positioning, navigation, and timing (PNT) technology and some kinds of remote sensing. This section compares Chinese and American progress in lunar exploration, low-Earth orbit (LEO) space stations, LEO broadband, PNT, rendezvous and proximity operations (RPOs), and remote sensing.

Lunar and Cislunar Activities

NASA is currently engaged in the Artemis program, a space exploration program slated to return American astronauts to the Moon in 2027 in preparation for future journeys to Mars. The Artemis program supports around 70,000 jobs across all 50 states as well as more than $14 billion in total economic output.[23] China also wants to place its citizens on the Moon, with a plan to land crew in 2030.[24]

Unfortunately, the Artemis landing date has slipped multiple times from the original date of 2024,[25] which has raised concerns that China could beat the United States back to the Moon. While the United States has already visited the Moon, the stakes are higher now that there are concerns about the potential for nations to claim resource-rich portions of the Moon for themselves. China's central planning apparatus and less stringent approach to safety and environmental concerns (see instances of toxic rocket debris falling over a populated area as recently as June 2024[26]) could enable the nation to move faster than the United States despite the United States having a substantial headstart in this race.

The Artemis Program has spurred the Artemis Accords, a U.S.-led diplomatic push to establish "a common set of principles to enhance the governance of the civil exploration and use of outer space."[27] That's vital in light of disagreements between the United States, China, and Russia at the United Nations regarding the interpretation of the Outer Space Treaty that have stalled traditional multilateral treaties on this subject.[28] There are currently 53 signatory nations ranging across six continents.

China and Russia notably have not signed, which has sparked concerns from American officials that China could engage in lunar land grabs that exclude United States activities on the Moon.[29] While the Outer Space Treaty, which both nations have ratified, bars nations from owning any portion of space, it also includes language noting nations should not "harmfully interfere" with each others' space activities.[30] There is not yet international agreement on how those two provisions should interact in practice given the nascent nature of lunar activities and the broad nature of what harmful interference could be inferred to mean.

China perceives the Artemis Accords as "a disingenuous attempt to stymie Chinese space ambitions."[31] China continues to push treaties within the United Nations that comport with their vision of peaceful uses of space, which the United States perceives as overly restrictive on national security capabilities in space, resulting in a stalemate.[32] Meanwhile, China has used its planned lunar base, the International Lunar Research Station (ILRS), to build its international partnerships. There are currently 13 nations spanning five continents participating in the ILRS, which is scheduled to be operational in 2035.[33] Only one nation is part of both the ILRS and the Artemis Accords.[34]

Beyond the crewed aspects of the Artemis program, the United States is also supporting a variety of uncrewed missions around and to the Moon, most notably through the NASA Commercial Lunar Payload Services program (CLPS) and NASA science programs like the Lunar Reconnaissance Orbiter (LRO). There are also national security programs like DARPA's LUNA-10 initiative that are working on ways to operate in space in a sustained manner. China is also executing numerous uncrewed lunar missions, including location scouting missions for the ILRS. The Chinese lunar program garnered extensive international attention when China returned samples from the far side of the Moon, which no nation has landed on before.[35] These samples add to scientific knowledge about the Moon and its evolution. China offered to share the samples with scientists from other nations in light of the scientific significance. NASA announced that American scientists are welcome to apply to receive samples for their research.[36] This sample return was cited in the Intelligence Community's annual threat assessments report as contributing "to Beijing's technological prowess and national prestige."[37]

Space Stations

The United States has had a foothold in low-Earth orbit (LEO) since 1998 via the International Space Station (ISS), developed, built, operated, and crewed in partnership between Canada, Russia, Europe, the United States, and Japan.[38] As the ISS nears its deorbit date, the United States has started the Commercial LEO Development (CLD) program, which could lead to multiple commercially owned and operated space stations in LEO.[39] ISS partner states are not participating in these commercial space stations, though some of these commercial space stations under development include corporate partners from ISS partner nations.

Details about how NASA will use commercial space stations have not yet been released as the agency continues to work through its requirements, though the agency has committed to continuing to have a "continuous heartbeat" in LEO — continually maintaining an astronaut in orbit — as well as conducting scientific experiments and technology demonstrations. NASA has also committed to champion international use of these next-generation space stations.[40] The ISS partnership between nations is expected to live on (minus Russia) through the lunar Gateway, a space station designed to orbit the Moon as part of the Artemis program.[41] Russia has grown closer to China in the space domain and is expected to continue deepening that relationship.[42]

China has been developing its space station since 2011, starting with the launch of a series of precursor stations to develop their capabilities culminating in the current Tiangong station launched in 2021. There are no international partners aiding in Tiangong operations, but China has invited international astronauts and experiments to come aboard; Pakistan will be the first foreign country to send an astronaut to visit Tiangong.[43] The European Space Agency had been exploring sending their astronauts but announced

in 2023 that they were no longer planning to do so due to their current commitment to the ISS as well as budgetary and political constraints.[44] While the price for sending foreign astronauts to Tiangong has not been published, it has been alleged to be substantially lower than sending an astronaut to the ISS, if not free, given China's strong interest in utilizing Tiangong to build the nation's soft power internationally. This is further supported by statements out of China emphasizing their "goal of reducing the 'threshold' for developing nations to access and explore space,"[45] signaling that their pricing is favorable.

Remote Sensing

Remote sensing is a blanket term for any satellite or high-flying device that scans the Earth to acquire information about it, such as imagery, chemical signatures, heat signatures, or something else. The United States dedicated substantial energy to developing world-class remote sensing capabilities during the Cold War to provide valuable intelligence on what adversaries were doing. During the 1960s, for instance, remote sensing allowed the United States to know that the Soviet Union did not possess more strategic nuclear weapons than the United States.[46]

American leadership in remote sensing has since steadily eroded. According to an open source analysis from the Center for Strategic and International Studies, today, the United States leads the world in just four out of eleven types of remote sensing while China leads in five. There are even a number of types of remote sensing, such as C-band synthetic aperture radar, which has applications for global mapping, landform changes, and ocean monitoring, where the United States doesn't even rank among the top three nations.[47]

This analysis did not incorporate classified technologies, so it is possible that national security and intelligence agencies have superior technology. However, in addition to its technical prowess, China is rapidly deploying remote sensing capabilities. U.S. Space Command has observed that China has "tripled the number of intelligence, surveillance, and reconnaissance satellites on orbit" since 2018 — a figure that has almost certainly grown since that April 2024 statement.[48] While the United States is rapidly deploying its own capabilities, experts remain concerned that current plans aren't aggressive enough.[49]

This technological state of play has implications for China's military prowess as well as its economic growth, especially given that American remote sensing companies with novel capabilities are typically subject to strict licensing conditions. Such conditions restrict the data remote sensing companies collect or can make available to the public, typically due to national security concerns when a new capability other nations do not possess is developed and deployed. Once other nations have developed a given capability, the company's license condition is removed, though this process is often delayed. While the National Oceanic and Atmospheric Administration (NOAA) has made great strides in streamlining and limiting the number and duration of these limitations,[50] remote sensing companies remain concerned that these license conditions erode their ability to compete internationally. Because companies deploying novel capabilities are usually subject to license conditions that limit the collection or public dissemination of their data that typically are not removed until there is evidence other entities offer the same capability, they are, inherently, never the first provider on the global market.

LEO Broadband

There are roughly 5-10 LEO satellite internet providers in various states of planning and operation. The companies are primarily American and Chinese, though there is at least one British provider and the European Union is developing its own sovereign capability.

One American company, Elon Musk's SpaceX, has already deployed a portion of its constellation of Starlink satellites and provides service to most places on the globe, though it is unavailable in a number of countries pending regulatory approval.[51] Starlink notably does not provide service to China because of its censorship regime.[52] The Department of Defense has extensively utilized Starlink for its operations, though there are concerns about Musk's relationships with foreign adversaries, particularly in light of an incident where Musk turned off Starlink service for Ukraine at a pivotal moment, stymying a military offensive in their fight against Russia.[53]

While Starlink is the only operational American LEO satellite broadband system, others like Amazon's Project Kuiper are being deployed now and are expected to come online in the near future. Having multiple providers and dissimilar redundancy in how users, particularly national security users, access broadband LEO services should reduce the risk of national security actors losing access to broadband when it's required.

China views having its own LEO broadband constellation as vital to its national security and multiple domestic Chinese providers have started launching their own constellations. Having seen the advantage it provides in the ongoing Russia-Ukraine conflict, China understands how vital Internet access is to military operations.[54] SpaceSail, one of these providers, has also started entering into international agreements to provide service to other nations.[55] In addition to the obvious soft power potential of offering Chinese LEO internet service in other nations and the potential for Chinese surveillance, there are concerns that these constellations could spread China's censorship regime beyond its borders.[56] This further bolsters Beijing's soft power influence by making certain information unavailable.

Positioning, Navigation, and Timing (PNT)

Positioning, navigation, and timing (PNT), commonly referred to as GPS in the United States after the name of the system that provides PNT, underpins a range of civil and national security capabilities, from Google Maps and bank fraud detection to missile targeting. Now available worldwide for free, the full GPS system became operational in 1993 and was opened fully to civilian users in 2000.[57]

GPS has long been regarded as the gold standard in PNT globally despite the availability of systems from the European Union, China, and Russia, but China's system (BeiDou) is rapidly overtaking GPS.[58] The Intelligence Community's global threat assessment report identified BeiDou as a world-class capability that is competitive with GPS.[59] This is largely due to the age and investment in the systems. GPS is substantially older than BeiDou and has not received the investment it needs to keep up with technological innovations. BeiDou has double the number of satellites as GPS along with more monitoring stations, which offer greater availability and accuracy.[60] BeiDou has also focused on providing service to regions underserved by GPS, including Africa and Southeast Asia, which strengthens those regions' relationships with China vice the United States.[61]

One of the most significant technological innovations the GPS system has not kept up with is anti-jamming technology. Jamming refers to blocking PNT in a given area, which disables systems that rely on PNT. Both BeiDou and the European PNT system, Galileo, have installed anti-jamming technology fleet-wide, while only a portion of the GPS system is equipped with the technology. This is significant because PNT-guided ammunition like the Joint Direct Attack Munition (JDAM) and drones are a key feature of modern warfare.[62] The United States will be at a strategic disadvantage on the battlefield until anti-jamming technology has been installed fleetwide.

Rendezvous and Proximity Operations (RPO)

Rendezvous and proximity operations (RPOs) refer to the approach, interaction, and connection of spacecraft.[63] RPOs are used in a civil context for missions like satellite refueling, orbital debris removal, and transportation vehicles docking with a space station or other vehicles. RPOs are also quite useful in a national security context as they can be used for missions like surveilling the activities of other satellites, ramming other satellites, or disrupting satellite operations through non-kinetic means like cyber or laser attacks at close proximity.

The United States has been carrying out such operations for decades, though most of them are shrouded in secrecy.[64] China is believed to have started carrying out RPOs in 2008, similarly primarily for military and intelligence purposes.[65] While the United States had a substantial head start in this arena, General Michael Gutlein, the Space Force's Vice Chief of Space Operations, recently noted that "there used to be a capability gap between us and our near peers, mainly driven by the technological advancement of the United States. That capability gap used to be massive. That capability gap is significantly narrowing, and we've got to change the way we're looking at space or that capability gap may reverse [and] not be in our favor anymore."

Five Chinese satellites were recently spotted maneuvering around each other in a controlled fashion–dogfighting in orbit.[66] A maneuver of this nature could be used to disable satellites in orbit. There are limited details on the specific capabilities of each country given the national security significance, but General Gutlein's comments imply that the United States still holds the upper hand technologically in this arena — for now.

RECOMMENDATIONS

If the United States remains on its current path, it could very well lose its leadership in space and the substantial advantages that come with it to China. However, there is still time to change course. Maintaining American competitiveness will require investments and architectural stability across the space program, fully harnessing the contributions of the private sector, modernizing the regulatory environment, and continuing international engagements. There is no singular silver bullet; there must be a holistic approach that takes into consideration the variety of factors that have contributed to the present state of play.

Government Space Program Investment and Stability

During the original space race, the United States was spending upwards of $50 billion annually — at times exceeding $65 billion annually — in today's dollars on NASA. At its peak, 4% of the federal budget went to NASA. Today, the nation spends just shy of $25 billion — or about a third of a percent of the federal budget.[67] NASA has been able to facilitate dramatic reductions in the price for access to space since the Apollo era, so the topline numbers alone don't tell the full story, but it's clear that public investment in the agency is far from its Apollo-era peak.

At the same time, however, NASA is being asked to do more than ever before. It is returning American astronauts to the Moon, supporting the ISS and the development of its commercial successor, supporting incredible robotic exploration and science missions of various sizes, and funding next-generation space technology work. A plus-up to the annual NASA budget to ensure the success of LEO commercial space stations, maintain science operations of older spacecraft as part of the balanced science budget, and increase our investment in space technology would pay dividends for the competitiveness of our space program.

Space technology investments are especially vital. This funding is the seed corn for the space

economy as it supports applied research that is necessary for the advancement of the industry. Yet because it is not specifically tied to a given program, it is often first cut during budgetary shortages, which may be penny wise, but is absolutely pound foolish.[68] National security space programs are better funded, but it will be critical to maintain their funding and ensure that funding is aligned with our national priorities in space.

Stability in government space programs will also be vital. These programs are key demand signals America's aerospace industry follows to determine their own investments. That is not to say that programs cannot occasionally change course if they are no longer relevant or technology has evolved, but the whiplash experienced in the 2000s and 2010s between a human spaceflight program focused on heading to the Moon, then to an asteroid, and then back to the Moon again was incredibly disruptive for progress in space exploration. The multi-administration focus on returning to the Moon is a step in the right direction, for which the Biden administration should be commended. Beyond crewed exploration, this principle also goes for technology development and science missions throughout the federal space enterprise. Commercial space companies remain eager to partner with the government and bring private capital to the table, but clear demand signals about where the government is looking to go are vital.

Harnessing the Full Potential of the Private Sector

China's biggest competitive advantage in this space race is their ability to centrally plan their path forward, fund it aggressively, and stick to it. The United States' advantage is its innovative private sector, which can help the government go further and faster if appropriately engaged. There are a number of steps the nation needs to take to better develop and harness it. Such steps include: (1) define a clear acquisition strategy for space assets, providing clarity to industry, and execute accordingly; and (2) actively include innovative capabilities in government programs like in-space servicing, assembly, and manufacturing or LEO broadband.

A clear acquisition strategy should delineate when agencies will develop capabilities in-house, when they will engage with traditional contractors for products without a broad non-government customer base, and when they will acquire commercially for products that should have other non-government customers (either currently or in the near-future). Traditional contracting refers to situations where a company produces a product that the government will own and sometimes operate with the government reimbursing cost overruns because they are the only (or one of very few) customer. Commercial acquisition refers to situations where a company offers a product or service to the government at a fixed price — typically with fewer requirements and without the government exclusively owning or operating the system so that they can sell the data or system to other customers.[69] These acquisition/contracting decisions seem arcane, but they make a big difference for the future of the technology as well as companies' decisions to develop technologies since acquisition strategy is a form of the all-important demand signal. The Biden administration's 2024 Space Force Commercial Space Integration Strategy was a step in the right direction that, at a high level, provided signals to industry on acquisition plans and should be emulated by other space agencies.[70]

An example is the exclusion of broadband LEO constellations from the Broadband Equity, Access, and Deployment (BEAD) program. The program strongly favors fiber technology over LEO constellation technology, even though LEO constellations are presently able to exceed desired performance.[71] While satellite broadband has faster installation and lower upfront costs, some

experts are concerned about the potential for higher long-term costs.[72] These are all factors that should be considered as states develop their plans, but the current structure of the program inappropriately and dramatically favors fiber. Both Commerce Secretary Howard Lutnick and House Republicans (via the SPEED for BEAD Act[73]) are considering modifications to the BEAD program to fix this. In doing so, it will be critical to ensure fair competition between LEO broadband providers to avoid giving currently operational systems an inappropriate leg up within the market. It will be challenging for states to pivot and benefit from modifications to program eligibility that allow for LEO satellite constellation participation this close to funding disbursement.[74] These reforms should have been part of the original plan for the BEAD program.

Additionally, innovative technologies often struggle to gain a foothold in government programs that are not specifically targeting the technology. This can be because they lack heritage, meaning they have not flown before, or because agencies prefer existing technologies they understand. Lack of heritage creates a chicken-and-the-egg problem for companies that create new technologies that weren't explicitly included in a government program. This spans civil and national security agencies. In-space servicing, assembly, and manufacturing (ISAM) is a great example: companies have ISAM technology they wish to fly for the benefit of the government, but they face challenges in actually being selected for programs due to lack of heritage. The Biden administration's National ISAM Strategy Implementation Plan identified this issue,[75] though it is far from the only technology area that struggles with this problem.

Modernizing the Regulatory Environment

Funding and demand signals are only half the battle for commercial space companies. A regulatory environment that promotes continued growth of this critical industry while continuing to protect American interests is essential. Unfortunately, the United States regulatory environment for space is disjointed and overly burdensome.

Though bodies like the Committee on Foreign Investment in the United States or the Pipeline and Hazardous Materials Safety Administration often come into play, there are three primary agencies that regulate commercial activity in space. Those agencies are:

- The Federal Aviation Administration's Office of Commercial Space Transportation, which administers launch and reentry regulations;
- The National Oceanic and Atmospheric Administration's Office of Space Commerce, which administers remote sensing regulations; and
- The Federal Communications Commission, which allocates and regulates radio spectrum.

All three of these regulatory regimes have been updated in the past five years, but none have cracked the code on keeping up with the pace required to support the growth of a vibrant space economy into the future. They must be reformed — or, at the very least, tweaked — to be as permissive as possible while continuing to protect national interests like preventing harm to the uninvolved public and property and essential national security capabilities. Any new regulatory regime, such as a mission authorization framework, which has been suggested both by Trump's first administration and the Biden administration, must prioritize simplicity and permissiveness to the greatest extent possible without sacrificing critical American interests. Beyond space-specific regulations, it will also be vital to avoid adopting broader policies like tariffs that are expected to harm the space industry

as the Trump administration has done[76] and be thoughtful about how export control is applied to the space industry.

Strengthening International Engagements

Just as the commercial sector is an important partner for NASA, so are other nations. The soft power Americans benefit from only grows when NASA partners with other nations. This takes the forms of missions, like the Canadian, Emirati, European, and Japanese contributions to the lunar Gateway or the NASA-ISRO Synthetic Aperture Radar (NISAR) mission, as well as international agreements like the Artemis Accords. This engagement must continue if the United States seeks to maintain its space leadership. Unfortunately, NASA has limited control over foreign relations, particularly as the Trump administration has antagonized traditional United States allies who have revitalized their space industrial bases so they can be less reliant on the United States.[77]

CONCLUSION

It is clear that the path the United States is currently on will result in China becoming the new leader in space, accruing all of the economic, national security, and global influence benefits that come along with that title. China is hard at work developing and deploying capabilities that get the nation closer to that goal, though the United States remains ahead in most areas for now.

This new space race requires a rapid shift in how the United States government engages with space activities and the domestic space economy. That shift must encompass increased investment in strategic areas, modifications to the regulatory environment, better harnessing the private sector, and strengthening international engagements, as addressing any one of these items in isolation will be insufficient.

ABOUT THE AUTHOR

Mary Guenther is the Head of Space Policy at the Progressive Policy Institute. In this role, Mary focuses on evaluating and developing policy solutions that address how the United States government's relationship with space actors should evolve and how to best harness the benefits of space for people here on Earth.

Prior to joining PPI, Mary served as the Vice President of Space Policy at the Commercial Space Federation (CSF). In that role, Mary drove consensus on space policy issues amongst roughly 90 member companies representing various facets of the commercial space economy and engaged with lawmakers, executive agencies, and the public to get those policy solutions implemented.

Prior to CSF, Mary served as a Professional Staff Member at the United States Senate Committee on Commerce, Science, and Transportation focusing on space, science, emerging technology, cybersecurity, and manufacturing policy. In that role, she worked with colleagues to author and pass through the Senate the CHIPS and Science Act as well as a variety of smaller pieces of legislation.

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