

Stars, Stripes, and Satellites

How to rebrand the American space program for a 21st century public

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OVER THE WEEKEND OF JULY 20, 2019, more than 500,000 people gathered on the National Mall to celebrate the 50th anniversary of the first humans landing on the moon.¹ The Washington monument glowed with a projection of the Saturn V rocket that carried the Apollo 11 astronauts to space, and the ground rumbled from the speakers as the crowd counted down to "liftoff". At exactly 10:56pm EST, an imprint of a boot appeared on the image of gray dust displayed on the monument, timed perfectly with American astronaut Neil Armstrong's momentous first step onto another world 50 years earlier. The crowd erupted in applause, people from all backgrounds and vocations, some who had watched the landing live in 1969 and many more who could not remember the last time humans walked on the lunar surface.

The Apollo program ushered in a new era of human discovery and scientific achievement, and today, space exploration and development have become vital to the daily lives of Americans. Weather and natural disasters can be monitored and predicted through Earth observation.² Satellites provide location and internet services to U.S. armed forces in remote regions around the world. Space makes it possible to have GPS on our cell phones and television in our homes. In addition, the technologies developed for human spaceflight have translated to advances in medicine, transportation, and more.³ However, space policy decisions have grown increasingly disconnected from this human narrative that drove innovation and commanded global respect during the Apollo era of the 1960s. Other foreign and domestic issues have taken precedence over space policy since the end of the Cold War, stagnating important conversations about the acceptable uses of outer space and minimizing public understanding of the impact space strategy decisions have on the country and its citizens. With the reestablishment of the National

Space Council, the formation of the United States Space Command, and the dedication to return to the moon to stay by 2024, the Trump administration has set forth a clear strategy for the next decade of civil and military space efforts, creating opportunities to improve U.S. capabilities and global leadership in space. These goals pave the way for continued international collaboration and economic growth while reassuring allies of U.S. dedication to space innovation.

Taking advantage of the opportunities that come with a strong national space policy requires an accompanying outward facing strategy that reconceptualizes how Americans understand space development, security, and exploration. The different sectors of the space industry do not exist in a vacuum; by demonstrating how national security and economic growth stem from both a national dedication to space exploration and defense, industry leaders can recapture public imagination and approval of efforts in space, leading to lasting bipartisan support from U.S. policymakers.

Effective Goals Lacking Strategic Unity

Though growing and evolving quickly, the current U.S. space strategy is a step in right direction. NASA's new objectives for a sustainable return to the moon on the way to landing an American on Mars, as well as the new bureaucratic structures governing space activities in the Department of Defense, are being developed fervently by industry leaders. Despite seeming unrelated, these separate civil and military visions should be clearly articulated to American and international audiences as being interdependent goals that – with consistent support and dedication from the country and its citizens – can protect America's sought-after role of bring the clear leader in space.

Being the global leader in space activities can be defined in many different ways depending on one's perspective. To many, space power means dominance, or as Audrey Schaffer, the Director of Space Strategy and Plans in the Office of the Secretary of Defense, described it, the ability to "gain and maintain space superiority at the time and place of one's choosing".⁴ To others, leadership means having control over the majority of economic benefits that come from space. The primary space leader would also have the most influence when establishing

international norms of behavior in space, making being a "good actor" an essential responsibility of this role.⁵ Though each of these definitions encompass different aspects of a national space program, they are each essential to creating a lasting approach to securing and sustaining space leadership. After an executive order signed by President Trump on June 30, 2017,⁶ the National Space Council has served as the architect of recent space policy decisions with the goal of defining strategies across the sectors of the industry in pursuit of American global leadership in space.

The National Space Council is chaired by Vice President Mike Pence and is composed of many of the administration's cabinet members and lead advisors. Meeting two or three times a year, the council advises the president on issues related to civil, commercial, and military space. This has spurred the White House to put forward four Space Policy Directives (SPDs) in addition to a National Space Strategy issued in relation to the National Security Council.⁷ Each outlines the Trump Administration's priorities – human space exploration and development, commercial space regulations, space traffic management, and defense of space assets – while still requiring congressional approval to implement. The success of the council was never a guarantee; throughout its complicated history of being established and disbanded over various administrations, it has sometimes struggled to establish unifying, cross-sector policies that effectively guide the U.S. space industry.⁸ However, the revived National Space Council has succeeded by consistently communicating with the White House to outline key visions, particularly with the declaration of the goals to send humans to land on the lunar surface through the Artemis program and to establish a new branch of the military through the Space Force.

In March 2019 in a speech presented to the National Space Council, Vice President Mike Pence tasked the National Aeronautics and Space Administration (NASA) with landing the first woman and the next man on the moon in the next five years.⁹ This announcement served as an extension of Space Policy Directive 1¹⁰ that added the goal of American crewed spaceflight to the moon and eventually Mars to the National Space Policy of 2010 from the Obama Administration.¹¹ Although a human lunar landing in 2028 was the timeline originally proposed for a sustainable return to the moon, the date of 2024 declared by Vice President Pence was not set by

mistake. As Doug Loverro described, a moon landing is not as "inspirational" a goal compared to a crewed Mars mission, but past failures of bold visions for spaceflight have demonstrated that "if goals aren't short term, we cannot understand them". A human Mars landing would take well into the 2030s even with dedicated investment of monetary and human resources. Working until 2028 would also take too long for a lunar landing, so the Trump Administration was forward-thinking to "set an objective that can be accomplished".¹² In addition, compared to other important missions of NASA including earth and space sciences research, human spaceflight has uniquely tangible goals that can be non-partisan if their purpose and benefits if they are effectively explained to American citizens.

Pushing to create a sustainable lunar presence is another essential part of the mission to return to the moon. The Trump Administration space strategies aptly recognize the opportunities presented by commercial partnerships along with the need for NASA to be the catalyst of new economic frontiers in deep space exploration. Since Space Policy Directive 1, NASA has articulated a future with a human support capsule orbiting the moon called the Lunar Gateway with commercially-provided lunar landing capabilities. This would be a milestone to building a permanent lunar base for scientific investigations and the study of human survival on celestial bodies before pursuing a longer trip to mars.¹³

Although the idea of settling the moon has been theorized since the origins of the space program,¹⁴ the current mission for human space exploration differs from other civil space efforts since the Apollo missions because of its name: Artemis. Announced in May 2019,¹⁵ Artemis, named after the Greek Goddess whose twin sister was Apollo, is intended to invoke the excitement that was inherent to the exploration of space in the 1960s. With specific goals and milestones outlined for the first step, a human lunar landing, and broad visions for a more distant future, Artemis strikes the balance of being a realistic yet bold goal behind which the country could rally. Making the commercial sector an integral part of the program, Artemis has the potential for significant economic stimulation in addition to technological innovation. As Vice President Pence confirmed when introducing this "Moon to Mars" initiative to the public, "The United States must remain first in space, in this century as in the last, not just to propel our economy and secure our nation, but above all because the rules and values of space, like

every great frontier, will be written by those who have the courage to get there first and the commitment to stay".⁹

The Trump Administration has placed emphasis on American leadership in space defense in addition to human exploration, through the proposal to create a sixth branch of the military: the United States Space Force.¹⁶ Space has been used for military purpose since the first satellites launched into orbit, split between the different branches of the military and across the intelligence community. In 2001, Secretary of Defense Donald Rumsfeld lead a commission to explore the role of space in national security; though the final report concluded that space should be a top priority while suggesting a centralization of military space capabilities under the Air Force,¹⁷ the war on terror took precedence after the attacks on September 11, 2001. While the Space Force proposal remains under congressional scrutiny, The United States Space Command was formally established on August 29, 2019.¹⁸ The U.S. Space Command has a long history, originally active between 1985 and 2002 before a bureaucratic reorganization placed its responsibilities under the U.S. Strategic Command.¹⁹

The conversation about the structure of and need for U.S. space defense capabilities has largely remained the same for two decades, but the time is right to make the investment and establish the U.S. Space Force. Having a Space Force instead of the current Space Command would recognize the important role space plays across conflicts in other domains.²⁰ Bureaucratic space defense institutions in the U.S. should be a priority as other nations have increased their reliance on space assets for national defense, leading to increasing threats from adversaries, a more congested environment in Low Earth Orbit (LEO),²¹ and therefore increasingly perilous consequences of collisions or attacks that would cause space debris.²² Doug Loverro, former Deputy Assistant Secretary of Defense for Space Policy, noted in a lecture at the Center for Strategic and International Studies that a Space Force is needed to consolidate the number of actors dealing with space within the U.S. military. He also emphasized that without a Space Force, there is no formal space doctrine and the U.S. would be in a poor position to respond to a threat. A formally established U.S. Space Force with a transparent doctrine would serve to disincentivize those seeking to challenge U.S. preeminence in space.²³

Audrey Schaffer, the current Director for Space Strategy and Plans in the Office of the

Under Secretary of Defense for Policy, played a key role in shaping the plans for the U.S. Space Force. She explained that in each branch of the military, there is a "culture of being the best at that domain" and how the Space Force is needed to develop that culture and personnel.⁴ While some may argue that the international community will get nervous if the United States formally establishes this new military branch, she explained, the resources for space defense already exist; the restructuring is needed to use them effectively. Even Jim Bridenstine, the administrator of NASA, has been a vocal supporter of Space Force, stating that a Space Force would uniquely allow the budgetary competition to fund military space actions to be at the same level within the Department of Defense as other areas of interest.²⁴ For space industry and military leaders, it seems to be less of a question of if a formal separate U.S. space defense is necessary than when it should be established and how it should be structured. The establishment of the U.S. Space Command and the continued development of the U.S. Space Force proposal are the first tangible recognition in recent years of the importance of space to U.S. national security and to U.S. adversaries who wish to challenge U.S. control in space.

As U.S. leaders debate about the details of the Artemis and the Space Force, the public does not receive a unified message about the purpose and benefits of these programs, and public understanding and support of these specific national civil and military space efforts is a necessity for ensuring their longevity. Space offers a unique opportunity to articulate a collective national goal, and the Trump Administration has adapted its high-level strategies to reflect what can be realistically achieved in a tangible time frame while asserting that the U.S. intends to remain the global leader in space capabilities. From strong public support for reasonable, long-term visions for space development, congressional support and, eventually, sustained support from future presidential administrations will follow.

The space strategies detailed by the White House, National Space Council, and space industry experts are incomplete without a significant focus on public engagement. Despite the NASA brand remaining an international phenomenon displayed proudly on t-shirts and baseball caps,²⁵ general knowledge about NASA's current crewed spaceflight goals and the reasoning behind them is extremely limited. Space Force also received significant attention after it was initially proposed, becoming a public topic of debate and a punchline on comedy

shows²⁶ without being grounded by a substantive conversation in the media. The American public still believes that the U.S. must remain a global space leader.²⁷ Therefore, American leaders must have a strategy by which to educate the domestic public about U.S. space strategy while considering the perceptions of an international audience as well. This grand strategy of public engagement should be focused on the key priorities across the globe for future space development and why the current approach laid out by the Trump Administration offers the best opportunity for the U.S. to remain a leader in each of these areas of interest.

Space leaders often fail to admit that learning about space development is something not everyone is intrinsically motivated to do, but when communicated to broad audiences with purpose and consistency, space exploration and even defense efforts can be compelling. U.S. leaders must commit to creating a grand strategy with the goal of communicating the importance of responsible global development of space under U.S. leadership, while showing citizens how this American space primacy can be achieved through national dedication to the Artemis program and military space reorganization. Despite clear policies guiding the direction of space under the Trump Administration, the lack of a communication strategy has stalled the space industry's attempts to galvanize national enthusiasm about America's current priorities in space.

An Interconnected Industry

With the establishment of a specific time frame for human deep space exploration in addition to new bureaucratic structures for national security in space, the roles of different sectors in the space industry have shifted significantly. The rhetoric of national leaders and the media have not given sufficient attention these changes, and civil and military space sectors have not demonstrated how they will be interdependent in a future space landscape. This has led to confusion about what agencies are involved in which U.S. space efforts as well as a lack of understanding about the purpose behind these programs. It is essential that industry leaders, under the guidance and direction of policymakers, communicate clear visions of the future of space as more actors develop capabilities, and what could be achieved under American

leadership in space.

The Air Force Space Command authored a report titled "The Future of Space 2060 and Implications for U.S. Strategy" in September 2019 after a Space Futures Workshop that included U.S. and NATO defense, civil, commercial, and academic leaders with the goal of assessing the effect of national power on the space domain up to 40 years in the future.²⁸ By describing potential futures as the result of different strategic decisions, the report drew several essential conclusions. Space will play an integral role in defining the political, economic, and military influence of different nations, with the primary benefits going to the countries that chose to prioritize developing a strong national space policy today. As just the first milestone toward the goal of defining a comprehensive U.S. space strategy, the report's emphasis on the interplay of different space sectors demonstrates just how essential developing a cross-industry focus is today.

Key industry leaders are beginning to recognize the importance of providing clarity on the individual responsibilities of different space sectors while describing them as part of the same narrative. These leaders have the responsibility to address misconceptions and share their goals with clarity and purpose. For example, the discussion surrounding the breadth of the role Space Force would have continues as the Senate and House meet to resolve differences in their separate fiscal year 2020 National Defense Authorization Act drafts, and Air Force leaders are working to correct any belief that a Space Force alone would dictate the path of U.S. space activities.²⁹ To assuage any public hesitancy or skepticism about U.S. investment in bold space programs, consistent efforts to implement a communication strategy that takes all the voices of the industry into account are invaluable.

A Strategic Public Rebranding of American Efforts in Space

Based on the assumption that the ultimate U.S. goal is to maintain national power by securing American primacy in space, a grand strategy for communication about space would educate the public about how the country and world would benefit long-term from investing across the sectors of the industry while considering both domestic and international audiences. Reconcep-

tualizing public perception of the American space program starts with a unified presentation of industry priorities through Artemis and the Space Force, keeping debates about program details private and identifying a powerful government leader as an advocate. Then, by recognizing what is important to American citizens today, national leaders should consistently communicate why investing in both civil and military space is important, how space can positively impact the country's economy, and the need for strategic diplomacy to ensure American space leadership. This strategy can close the gap between America's goals in space and public understanding of space investments, creating an opportunity for continued support even through evolving political leadership.

The details about Artemis and Space Force are still debated among space industry leaders; however, the first step to a strategic presentation of American space strategy to the public is relaying a consistent message to the media. "The surprise of the Trump Administration's call for a Space Force made it a political tagline", Doug Loverro explained.²³ Without describing the history of the Space Force idea as well as the decades-long military use of outer space, the proposal is taken out of context by the public. Because these types of large programs are always in development, Loverro continued, they appear broken. Taking these issues into account, it is essential that industry leaders make the effort to refrain from politicizing the conversation surrounding the importance of improving the country's space defense capabilities, keeping the big picture and main rationale behind this proposed military restructuring the focus of attention.

National leaders have invaluable influence over the outcome of bold, long-term visions, and any space program requires a public champion to thrive. Gene Kranz emphasized this during his testimony at a Senate hearing in July 2019, explaining how leadership that creates sense of unity starts with a top-down vision.³⁰ The circumstances surrounding the Apollo era cannot be repeated;³¹ however President John F. Kennedy can be looked at as an example of a non-polarizing, charismatic leader who championed the exploration and development of space for the good of the country. While Kennedy recognized the role human spaceflight would play in achieving American global prestige, he wasn't necessarily passionate about space itself.³² The onus therefore rests on space leaders to communicate the impact space has on the lives

of American citizens to policymakers.³¹ Simply having a few key policymakers behind space initiatives is not enough in itself either as someone is needed who can bridge the gap between all sectors of the industry and represent the broader goals for the U.S. in space from within the government. The Trump Administration is polarizing, and with the 2020 Presidential Election campaigns ramping up, it is unclear that any of the current space policies will receive support from the Democratic candidates. Space needs a presidential champion who is not shrouded in controversy, or at least vocalized support from influential government leaders within both parties.

In addition to having bipartisan support, ensuring simultaneous investment across the sectors of the industry demonstrates how space development as a whole benefits the country. Civil, military, and commercial space are inherently intertwined, and growth in each field will positively impact the others. For example, NASA Administrator Bridenstine explained at a space sustainability summit in June how human exploration raises the cost of taking kinetic military action in space while pushing the bounds of technical innovation that supports other fields.³³ In addition, collaboration between sectors can help with messaging; Victoria Samson, the Secure World Foundation's Washington Office Director and space law expert, described how some of the issues surrounding the reception of Space Force in the public is due to poor messaging,³⁴ especially by invoking the image of space as a "war-fighting domain".¹⁸ "The military traditionally talks to itself", Samson explained. By demonstrating how new bureaucratic infrastructure for space defense can help with civil space pursuits, the Space Force could become more appealing and look like a serious venture to the American public.

Many space technologies are valued across the industry for their dual-use capabilities, meaning they could be used for both peaceful or military purposes depending on the operator's intent. As Naval War College Professor Joan Johnson-Freese explained, the military tend to define threats by capability, including when the Soviets feared the U.S. Space Shuttle in 1978.³⁵ Increasing communication across the industry could help with determining the intent of foreign space technologies as well to avoid miscalculation and escalation when tensions between countries in space inevitably develop. Todd Harrison, Director of the Center for Strategic and International Studies Aerospace Security Project, outlined how to achieve stability in space

through strategies that require the cooperation of the entire industry.³⁶ He argued that stability would be more likely with the enhancement and protection of space capabilities, identification of escalation thresholds and response options, partnerships with allies, and communication of capabilities to deter attacks from adversaries. While the military would have the ultimate responsibility to implement these standards, having an accurate understanding of the status of American space capabilities requires cross-disciplinary collaboration and communication.

The U.S. economy has benefited greatly from investments in space as well. Globally, space has an estimated \$365 billion market.³⁷ Technology is economic fuel,¹² and space has the unique benefit of being able to achieve bipartisan support when marketed correctly. As Doug Loverro explained, investments in space go directly back into the national economy, and space increases cost savings and efficiency in other industries leading to further economic benefit.³⁸ Communicating a clear vision of U.S. space programs to the public will not just garner the support of American citizens but companies as well. In the age of start-ups, lawmakers are making an effort to create balanced commercial regulations that protect U.S. national security while allowing enough flexibility for commercial innovation. The right regulatory environment combined with a national commitment to pursuing space development would make the U.S. an appealing jurisdiction in which to establish new business.

The U.S. Space Force and Artemis would both be reliant on commercial partners and the continued economic appeal of space to succeed, but international partnerships are a key aspect of U.S. civil space development today as well. The diplomatic benefits from strategic communication about both U.S. military and civil national efforts in space would be great. While American efforts in space are pursued with the end of sustained U.S. space leadership in mind, the U.S. must lead but within context of international system. National leaders should place emphasis on the need for a positive international perception of the U.S. as leader, and communication about American space goals to both domestic audiences should be framed in this context. Artemis offers a chance to extend current partnerships, engaging both established and emerging space programs. Most recently, the Australian Space Agency, founded July 2018, has committed to join the U.S. in work related to Artemis and lunar exploration after a visit of their Prime Minister to NASA Headquarters.³⁹ The creation of the Space Force also offers

new opportunities for strategic presentation of U.S. intentions. The growing capabilities of adversaries and the announcement of recent cooperation between Russia and China on a lunar orbiter mission⁴⁰ create a sense of urgency in the U.S. Any communication about U.S. actions in space must recognize that Americans do not want to collaborate with Russia or China today. Therefore, a necessary challenge would be to encourage public support domestically by characterizing the need for space development by labeling competition with adversaries as a "new space race" while maintaining clear international communication about the intention and capabilities of the American military space sector.

A communication strategy should also include space sustainability when speaking especially to international audiences. Sustainability is an international effort and required for the long-term, future of development of space to be a relevant discussion. It is essential that the U.S. be known as a good actor in terms of international norms for preventing the buildup of space debris and the improvement of space situational awareness capabilities. The United Nations Office of Outer Space Affairs (UNOOSA) Committee on the Peaceful Uses of Outer Space created 21 guidelines for minimizing space debris in June 2018;⁴¹ the U.S. should both follow these guidelines and be a vocal advocate for them or similar declarations in the future. One harmful source of space debris today is the test of anti-satellite (ASAT) missiles in low-Earth orbit, including a Chinese ASAT test in 2007⁴² and an Indian ASAT test⁴³ this spring. It is the responsibility of the U.S. as a space leader to condemn ASATs to prevent them from becoming the norm for displays of new capabilities and power of foreign space actors. Domestic strategy to rebrand American space efforts in the public eye are important, but domestic perception of the United States will significantly impact future space programs as well.

When it comes to making long-term space visions sustainable despite politics and changes in leadership, focusing specifically on youth education is important. Beyond budgetary resources, personnel is the most valuable piece of the puzzle when it comes to accomplishing innovative feats in space. To attract the best engineers, scientists, and researchers to work on American space programs, the U.S. should provide a clear path for foreign students to come and stay in the United States.³⁷ In addition, high-level space policy decisions should be translated through decision-makers and role models with specific focus on youth,⁴⁴ inspiring

kids and young adults to actively participate in space as part of what NASA leadership calls the "Artemis Generation".³³ The aerospace industry must then provide top-tier opportunities and a nation-wide focus on job training and science funding to ensure that students who experience a spark of interest in space when they are young see avenues to pursue that interest as a career.⁴⁵

Overall, each of these messages about space diplomacy, economic benefit, and more should be rooted in the idea that space benefits the every day life of American citizens, and without space, modern levels of convenience could not be achieved. Space historian Roger Launius observed that citizens do not tend to feel the impetus to support national policies for reasons beyond their health or a personal connections;³¹ however consistent communication about the purpose of American space programs will help provide answers about if space investments are necessary. Many of the most important technologies that space makes possible "end up disappearing", Ed Parsons from Google noted, as they eventually integrate with everyday lives.⁴⁶ Some experts, including Professor Joan Johnson-Freese understand public characterization or lack of understanding of space as not necessarily a cause for concern. In her book *Space Warfare in the 21st Century*, Johnson-Freese compared knowing about space to understanding how cars work. "Car drivers do understand the need for mechanics to perform maintenance...That might not be the case regarding space assets".⁴⁷ It is a challenging task to communicate technologically complex issues to a broad public. Still, if the United States is to commit to goals in space that will take longer than a single presidential administration to develop, public support through education should undoubtedly be a priority.

Future Focus

The year of the 50th anniversary of Apollo 11 is the right time to usher in a new era of space development that captures the imagination of American citizens. The United States Space Command and Moon to Mars Artemis program are both in the earliest stages of development, providing a window of opportunity to design and implement a grand strategy that will spread public knowledge about these space programs effectively and efficiently. U.S. space leaders should feel a sense of urgency in taking advantage of this opportunity to create a foundation of

American understanding and support for space.

Experts agree that America will not be able to recreate the combination of circumstances that made the push for the first human moon landing so unique.³¹ Still, this cannot be an excuse for complacency. For proposed space efforts to endure across political divides and to establish a precedent of making space a priority, U.S. leaders must work to bridge the gap between different sectors of the industry to present a united vision of lasting American space leadership to the public. Policy makers and space experts must maintain and open dialogue and work to create a presence in space that can be supported across the aisle before announcing new missions. The onus is on the space industry to prioritize public education while national political leaders push to depoliticize space, focusing on its human narrative and the benefits of its development. While many questions have yet to be answered concerning the future of global space activity, a strategy to help the public reconceptualize American goals in space will demystify national security space policy and make Artemis a household name. With a dedication to strategic communication about space, a future in which the U.S. has an established space security doctrine when the world livestreams the return of American astronauts to the moon is a future well within our reach.

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