

America's Commercial, Exploratory, and Defense Space Programs Have Thrived Since 2017—But Regaining Space Leadership Is a Long-Term Endeavor

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KEY TAKEAWAYS

The Trump Administration has taken several bold steps to put the U.S. on the threshold of regaining the upper hand over all other nations in the domain of space.

China and Russia believe that their routine access to space, and its denial to others, during war are critical components of their national and military strategies.

Congress should fully fund NASA and the new Space Force, and continue to streamline requirements for companies looking to compete in space.

Over the past four years, the United States made great strides toward regaining the global lead in space. The National Aeronautics and Space Administration (NASA) has been given new strategic guidance for human exploration of space and the funding required to make it happen. In 2020, the commercial sector will all but double the number of spacecraft launches from U.S. soil in a single year, bringing on-demand, low-cost space access closer to reality.

The Department of Defense has been re-organized to add a new service and a new combatant command whose collective focus is warfighting in space. Those gains should be celebrated, as they have put the United States on a trajectory to accelerate past all other nations in this critical domain. During the next four years, America must use its current momentum to ensure that the most noble ends of security in,

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exploration of, and access to space are achieved for both the United States and the free world.

NASA

America led all other nations in space from the mid-1960s through the end of the Space Shuttle program, but there were signs that NASA was in decline well before the *Atlantis* flew that program's last mission in 2011. By that point, President Barack Obama had cancelled the Constellation program,¹ a plan to establish a manned presence on the Moon and culminate with a crewed flight to Mars as the ultimate goal. That cancellation ended the development of the *Ares 1* and *Ares V* rockets² and the *Orion* crewed spacecraft,³ but the announcement was eased with a promise to increase NASA's budget by \$6 billion over a five-year window beginning in 2011.⁴ Yet, the Obama Administration would actually reduce funding to that agency by more than \$11.4 billion in constant 2010 dollars over that same period.⁵

President Obama's strategic vision for NASA during the remainder of his time in office was an asteroid retrieval mission that received muted support on Capitol Hill, at NASA, and internationally.⁶ But cuts to funding for the development of rocket engines and spacecraft during his Administration deferred the necessary funding and leadership required to implement those goals to future Administrations.⁷ Those actions would leave a nation that had once led all others to now rely on Russian rockets to deliver U.S. astronauts to space for the next nine years.

A Comprehensive Change in Trajectory

The outlook for NASA and the U.S. space program as a whole changed in 2017, when President Donald Trump issued Space Policy Directive 1 (SPD1), the first of five memoranda issued by the Administration to rekindle American dominance in space. SPD1 directed NASA to begin an integrated program with private-sector partners for manned missions to the Moon and Mars,⁸ and, unlike the previous six years, the Administration provided the funding to achieve those objectives. Assuming the President's budget for fiscal year (FY) 2021 passes, funding for NASA will have increased by more than 31 percent since 2016, and the funds dedicated to deep space exploration will have grown by more than 260 percent.⁹

In June 2020, U.S. astronauts traveled to space in the first vehicle launched from U.S. soil since 2011. Through a multi-phased program named Artemis, NASA is committed to landing American astronauts on the moon

by 2024. By 2028, assuming the program stays on track, the plan is to launch a sustainable stream of missions to the lunar surface in preparation for the next major phase of Artemis—sending astronauts to Mars. The whole of the Artemis program relies on NASA’s integration with commercial space organizations, an area which has also blossomed over the past four years.

Commercial Space Launch

In 2010, three commercial organizations—United Launch Alliance, Orbital Sciences (now merged with Northrop Grumman), and SpaceX—provided launch services in the United States, a number that would remain stagnant through the end of the Obama Administration.¹⁰ To spur competition and encourage U.S. space commerce and commercial launch capacity, the Trump Administration issued Space Policy Directive 2 (SPD2) in May 2018. SPD2 streamlined licensing regulations and replaced prescriptive requirements with performance-based criteria,¹¹ which has helped to double the number of commercial organizations shooting for the stars.

In 2020, six private U.S. corporations, including Astra Space Launch, Rocket Lab, and Firefly Aerospace, are actively engaged in placing satellites into orbit for the United States.¹² In July, Rocket Lab launched its first rocket into space, Astra Space’s first launch attempt failed in September, and Firefly Aerospace’s first launch is scheduled for November 2020.¹³

The dramatic increase in commercial space activity will levy significant weight on space traffic management. In an effort to plan for those challenges and streamline the increased launch activity, the Trump Administration issued Space Policy Directive 3 (SPD3) in June 2018. SPD3 directed the development and implementation of Space Situational Awareness and Space Traffic Management systems to support launch expansion and U.S. interoperability with national and international partners.¹⁴

A window into the increased volume with which SPD3 was meant to cope is evident this year as the six active U.S. space corporations are scheduled to launch 53 missions into space—24 more than the number of launches from U.S. soil *in any other single year*. Among those 53 was a manned launch that occurred on May 30, 2020—the first from the United States since 2011.¹⁵ China and Russia are scheduled to conduct 22 and 21 launches, respectively, in 2020,¹⁶ which means America has rocketed past its peers with this vital capability. The orbital access those private companies give the U.S. will be critical to winning the great-power competition that lies ahead, and it will also deliver a significant advantage regarding payload delivery for the third leg of this trifecta—the Defense Department.

The Department of Defense

Over the past two decades, both China and Russia have developed doctrine, organizations, and capabilities to challenge U.S. access to, and operations in, space. Both nations regard space access and its denial to others in times of war as vital components of their national and military strategies.¹⁷

Speaking at a virtual Heritage Foundation event on October 7, Justin Johnson, the Acting Deputy Assistant Secretary of Defense for Space Policy, stated that China and Russia have made space a warfighting domain. In that vein, both have invested heavily in ground-based, anti-satellite (ASAT) missiles and orbital ASAT programs. These systems can deliver a kinetic strike¹⁸ or undertake co-orbital activities that can jam signals, or even alter U.S. satellite orbits.¹⁹ Each is designed to hold U.S. and allied space capabilities at risk.

China's 2007 direct-ascent ASAT test marked a new era in space. Since that time, the People's Liberation Army has fielded an operational ground-based ASAT system intended to target low-earth orbit satellites, and is now likely pursuing an ASAT weapons system capable of destroying satellites in up to geosynchronous orbits.²⁰

Last fall, Russia launched a satellite (Kosmos-2542) which, once in orbit, released a second satellite (Kosmos-2543), and the two birds maneuvered to shadow a U.S. government satellite. In July of this year, Kosmos-2543 launched a projectile that passed in near proximity to another Russian satellite, likely demonstrating a spaceborne ASAT capability.²¹ Those threats are very real, and until recently, the United States had not taken steps to protect its spaceborne systems, much less to develop its own warfighting capability in that domain.

The 2017 National Defense Authorization Act (NDAA) mandated a review of the organization and command and control of space assets within the Defense Department. Shortly after the results of that study were released, President Trump issued Space Policy Directive 4 (SPD4), which directed the establishment of a new combatant command (U.S. Space Command), and the steps that would lead to a sixth uniformed service (the U.S. Space Force), its supporting agencies, and their interactions.²² Both Space Command and the Space Force became realities in 2019, giving the Defense Department the footing it needs to protect the other two legs of the U.S. space trifecta and defend the ultimate high ground for the United States and its allies.

The gains made with NASA, America's commercial space sector, and the Department of Defense's space program have been significant over the past

four years, but the great-power competition at hand requires continued persistence and continued U.S. momentum in all three areas.

A 2001 Rand study estimated that 95 percent of space technologies have direct applicability to military systems, or are of dual use,²³ which means that it is critical to view and support America's Space program through a holistic lens. That is certainly the way China views its program.

NASA Administrator James Bridenstine recently stated that one of China's goals is to control low-earth orbit, where most commercial and scientific satellites are in orbit for their own commercial and security purposes.²⁴ In 2021, China is expected to begin constructing its own space station in low-earth orbit,²⁵ an effort designed to build alliances and leverage diplomatic opportunities. The Chinese have invited the member states of the United Nations to use the facility and, to date, China has reached agreements with 17 countries and 23 entities to conduct scientific research projects.²⁶ Even the European Space Agency is considering a joint venture.²⁷

China has an ongoing, multi-phase program to land robotic, and ultimately manned, systems on the lunar surface. Among that program's many goals is to verify the utilization and development of the Moon's natural resources.²⁸ The Artemis program will rely on lunar materials to explore Mars and it is critical that the standards for mining and commerce on the lunar surface and the celestial bodies beyond be in line with the 1967 Outer Space Treaty. Precedent will carry a great deal of weight in that regard, and it is important that the United States be the one to establish that precedent.

To make that happen, NASA requires sufficient funding to meet the aggressive timelines associated with the Artemis program. The appropriations bill that the House of Representatives passed in July would give NASA just \$22.6 billion, falling more than 11 percent short of the President's budget request.²⁹

NASA's budget authorization should be increased by \$2.6 billion in conference negotiations to keep Artemis on schedule. Congress should also continue to robustly fund the Space Force and hold the course on streamlined requirements and licensing regulations for those corporations looking to compete in this domain.

Recommendations for the U.S. Space Trifecta

The Trump Administration and future Administrations should:

- **Place America's ascendancy in all three sectors of space at the forefront** of its strategic objectives.

Congress should:

- **Authorize \$25.2 billion in funding for NASA in FY 2021.** Congress should sustain robust levels of funding for NASA and the Defense Department's space program.

NASA, the U.S. commercial space entities, and the Defense Department should:

- **Engage in continual dialogue to understand the needs and streamline interactions with each other.** The dual-use nature of space technologies, coupled with known threats from America's strategic competitors, mean that these three components will have to rely on each other in order to succeed.

Conclusion

The Trump Administration has taken extraordinary steps to put the United States on the threshold of leading all other nations in the domain of space, and through FY 2020, Congress has backed those steps up with commensurate funding. The long-term viability of America's space program relies on a seamless stream of Administrations that support a vision for America's dominance in this domain and congressional funding that matches that vision.

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