Issue brief Invest in space or lose the strategic high ground

E. Aaron Brady and Clementine Starling-Daniels

Space superiority underpins military dominance across all domains. To deter and win future conflicts, the United States must significantly invest in the capabilities of its Space Force—including space command and control, as well as domain awareness.

> "Space advantage is essential to US power; it enables our forces to see with greater clarity, sense in the darkest of nights, and apply judicial precise force when directed."
>
> *— Major General Gregory Gagnon, US Space Force*[1]

Bottom lines up front

- The outcome of future great-power wars will rest heavily on who controls space.
- Space-based capabilities form the backbone of operations across the entire joint force, especially Combined Joint All-Domain Command and Control (CJADC2) and long-range kill webs.
- The US Space Force needs substantial investment in capabilities essential to gaining and maintaining space superiority—particularly space access, space control, command and control, and space domain awareness. While estimates vary, the Space Force will need at least a 10 percent annual budget increase over the next five years.

Winning space superiority is vital in major-power conflict

Space will be a decisive factor in shaping the direction—and possibly even the outcome—of the next major-power war. Ever since humanity first ventured beyond Earth, the ability of air forces—and now space forces—to affect military activity on the ground has only grown. Ever since World War II, obtaining air superiority, or at least denying it to the enemy, has been essential for successful surface operations. Today, this same logic holds for space: control of the air enables dominance on the surface, but space superiority will determine dominance of both air and surface (land and sea) Throughout the twentieth century, air superiority translated into dominance on the ground. Militaries with air superiority were able to sense adversary activities on land and at sea through aerial reconnaissance. Strike aircraft could then attack targets at ever-increasing ranges and with growing precision and potency. By the end of the twentieth century and the beginning of the twenty-first century, the United States could hold pinpoint targets at risk in virtually any spot on the globe. Advanced air capabilities, supported by early space effects, made this previously unheard of capability possible by enabling access to contested airspace and delivering precision strikes.

1. Gregory Gagnon, "Why Military Space Matters," *Joint Force Quarterly* 110 (2023), https://ndupress.ndu.edu/Media/News/News-Article-View/Article/3450009/why-military-space-matters/.

$39.9 billion

The president's budget request for the Space Force for fiscal year 2026[2]

$29 billion

The proposed congressional budget for the Space Force for fiscal year 2026—a decrease from previous years[3]

$33+ billion

The minimum cost of building a lethal Space Force[4]

Today and in the future, this same dynamic will play out in space. Militaries with space superiority will be able to sense adversary activities on land, at sea, and in the air, using space-based sensors. Strike platforms and sophisticated long-range weapons will strike targets at unprecedented ranges by relying on space-based sensors, communications, and command and control. The emphasis on Combined Joint All-Domain Command and Control (CJADC2) by the Department of Defense (DoD) illustrates this notion. The Space Force recently released its first-ever Space Warfighting Framework, which defines space superiority as the "degree of control that allows forces to operate at a time and place of their choosing without prohibitive interference from space or counterspace attacks, while also denying the same to an adversary."[5]

Space superiority is enabled by space control, which comprises offensive and defense activities required to contest and control the space domain. On the offensive side, such activities include orbital strike, terrestrial strike, and space link interdiction—while defensive activities include active and passive space defense. This first-of-its-kind document from the Space Force underscores the critical importance of space superiority as a joint force priority, recognizing it as a cornerstone for successful military operations across all domains.[6]

The necessity for space superiority is also being driven by China's and Russia's significant investments in space and counterspace capabilities that can hold US, allied, and commercial space assets at risk. Their rapid developments in these areas could lead Beijing or Moscow to leap ahead of the United States in several respects. General Stephen Whiting, commander of the US Space Command (SPACECOM), recently asserted that China has moved "breathtakingly fast" in fielding space-based over-the-horizon kill chains and counterspace weapons, including cyberattacks, electronic warfare, orbital weapons, and more.[7] If control of space proves to be highly influential—if not decisive—in a future conflict,

2. "A Bill Making Appropriations for the Department of Defense for the Fiscal Year Ending September 30, 2026, and for Other Purposes"; Robert S. Wilson, "FY 2025 Defense Space Budget: Continued Emphasis on Proliferation under a More Constrained Top Line," Center for Space Policy and Strategy, June 2024, 2, https://csps.aerospace.org/sites/default/files/2024-06/FY25BudgetBrief_20240605.pdf; "Department of the Air Force President's Budget Request FY26." Financial Management & Comptroller. Accessed July 15, 2025. https://www.saffm.hq.af.mil/FM-Resources/Budget/Air-Force-Presidents-Budget-FY26/.
3. "A Bill Making Appropriations for the Department of Defense for the Fiscal Year Ending September 30, 2026, and for Other Purposes," US House of Representatives, June 8, 2025, https://docs.house.gov/meetings/AP/AP02/20250610/118380/BILLS-119-SC-AP-FY2026-Defense.pdf.
4. David A. Deptula and Mark A. Gunzinger, "Air Force and Space Force Vectors for the Incoming Trump Defense Team," *Mitchell Institute Policy Paper* 59 (2025), https://www.mitchellaerospacepower.org/app/uploads/2025/02/Air_and_Space_Vectors_Policy_Paper_59-WEB.pdf. This is a roughly 10-percent increase from the FY25 President's Budget Request based on the Mitchell Institute's recommendation of a 10–15 percent increase each year over the Future Years Defense Program.
5. "Space Warfighting: A Framework for Planners," US Space Force, April 10, 2025, 3, https://www.spaceforce.mil/Portals/2/Documents/SAF_2025/Space_Warfighting_-_A_Framework_for_Planners_BLK2_(final_20250410).pdf.
6. "USSF Defines Path to Space Superiority in First Warfighting Framework," US Space Force, April 17, 2025, https://www.spaceforce.mil/news/article-display/article/4156245/ussf-defines-path-to-space-superiority-in-first-warfighting-framework/.
7. Colin Clark, "US Space Command's Gen. Whiting Talks Golden Dome, EW and China's Space-Based Kill Chain," Breaking Defense, June 24, 2025, https://breakingdefense.com/2025/06/us-space-commands-gen-whiting-talks-golden-dome-ew-and-chinas-space-based-kill-chain/.

China's space capabilities should be a major concern for US policymakers.

Space power is also essential to deterring strategic attacks on the US homeland and defending US territory if deterrence fails. Key elements of US nuclear command, control, and communications—which are essential for maintaining strategic deterrence—are based in space and are currently undergoing modernization. If deterrence fails, space assets that perform missile warning and missile tracking missions would be essential for US missile defense, secure communications that ensure the national command authority can relay instructions to deployed nuclear forces, and nuclear detonation detection, which is vital for supporting presidential decision-making.[8]

How does space power make the rest of the military more lethal?

Space power underpins power in the terrestrial domains. Forces in the traditional domains will be far less lethal without space power. Effects delivered from and through space provide the bedrock for most military functions, including especially intelligence, surveillance, and reconnaissance (ISR), command and control (C2), and fires. Space-based sensing already dominates strategic ISR and will soon provide much of the tactical ISR the military needs.[9] Between 2008 and today, the number of commercial ISR satellites grew from one hundred fifty to over nine hundred satellites, and this number is expected to increase to over two thousand observation satellites by the early 2030s.[10] Precision navigation and timing (PNT), mostly provided by the Global Positioning System (GPS), enables coordination of joint forces across the globe and is critical for a variety of operational needs, including secure communications and accurate weapons. Command and control, especially within the new CJADC2 concept, relies on satellite communications (SATCOM) for both voice and data transport. The DoD's future employment model, embodied by concepts like CJADC2 and kill webs, virtually requires space power to deliver these effects.

What does the Space Force need to be lethal in space?

Delivering these effects for the rest of the joint force requires SPACECOM (largely through forces from the Space Force) to maintain access to space and to be able to achieve space superiority through space control. Just as domain superiority is the primary purpose of the older services like the Air Force and Navy, space superiority should be the primary purpose of the Space Force. This, coupled with the centrality of space-based effects for the rest of the joint force, means that Secretary of Defense Pete Hegseth's vision to focus on lethality should begin with a highly lethal Space Force, able to fight and win a large-scale war in space against the pacing threat, China. Without space superiority, the effectiveness of US forces across all domains—land, sea, air, and cyber—is at risk.

Achieving this necessary level of lethality requires, in the words of Chief of Space Operations General Chance Saltzman, that the Space Force undergo a transformation akin to the US Merchant Marine transforming into the US Navy[11]—an evolution from a support-oriented, peacetime posture to a fully capable warfighting force. This transformation requires deliberate, sustained investment by policymakers and defense leaders. Priority areas for investment must include assured space access and robust space control capabilities to ensure freedom of action in space, defend US space assets, and hold adversary systems at risk. These must be paired with advanced command and control and enhanced space domain awareness, enabling US forces to detect, characterize, and respond to hostile actions in real time. Together, these capabilities form the backbone of a lethal Space Force—and by extension, a credible and capable joint force prepared for the demands of future conflict.

8. Peter L. Hays and Sarah Mineiro, "Modernizing Space-Based Nuclear Command, Control, and Communications," Atlantic Council, July 15, 2024, https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/modernizing-space-based-nuclear-command-control-and-communications/.
9. Thomas D. Taverney, "The Evolution of Space-Based ISR," *Air & Space Forces,* August 10, 2022, https://www.airandspaceforces.com/article/the-evolution-of-space-based-isr/.
10. Andrew J. Tatem, Scott J. Goetz, and Simon I. Hay, "Fifty Years of Earth-Observation Satellites," *American Scientist*, September–October 2008, https://www.americanscientist.org/article/fifty-years-of-earth-observation-satellites; Andrew Cavalier, "How Space-Based Data Will Drive the Digital Economy," Via Satellite, January 14, 2025, https://interactive.satellitetoday.com/via/january-february-2025/how-space-based-data-will-drive-the-digital-economy.
11. Chris Gordon, "Saltzman: New Space Force Readiness Model Will Be 'Drastic Change,'" *Air & Space Forces,* April 23, 2024, https://www.airandspaceforces.com/saltzman-new-space-force-readiness-model-will-be-drastic-change/.

Space access—the ability to move equipment and people into, from, and through space—is one of two functions that need significant investment. Three aspects of space access require particular focus: launch facilities, spacelift, and satellite control. The Space Force currently relies on two launch facilities despite the number of launches increasing by 900 percent between 2017 and 2024.[12] Adding or expanding launch facilities could help relieve pressure—especially as the Golden Dome program, which proposes a multi-layered missile defense system for the United States, is likely to significantly increase the number of launches the Space Force will pursue in the coming years. Spacelift, especially heavy spacelift (launches carrying more than twenty thousand kilograms), is also inadequate. The National Security Space Launch (NSSL) program, currently in phase 2, is suffering from a backlog due to only two providers: SpaceX and the United Launch Alliance (ULA). ULA's years-long delay in fielding the Vulcan rocket has significantly contributed to a growing launch backlog in phase 2.[13] While SpaceX is picking up some of the load, government support and incentives for another heavy spacelift company could pay dividends in improving space access and, therefore, enabling space control in the future.[14] Without increases in spacelift capacity, many of the space programs described above, including JADC2 and Golden Dome, are at risk given their heavy reliance on space capabilities. Moreover, in a future conflict, the ability to rapidly replenish on-orbit capabilities will be essential, given Chinese advances in space weapons. Expanding launch facilities and increasing spacelift capacity would improve the ability of the United States to access space during conflict and, in turn, improve deterrence.

Space control and counterspace operations—the set of activities required to contest and control the space domain, including its most directly lethal capabilities—demand investment in a wide range of systems. This is the aspect of Space Force resourcing most closely aligned with Saltzman's analogy of turning the Merchant Marine into the Navy—the Space Force needs to field robust space control capabilities as quickly as possible to contest Chinese and Russian attempts to dominate the domain.[15] The needed capabilities are diverse and include items such as bodyguard satellites, space-based electronic attack, and other surface- and space-based capabilities able to defeat adversary attempts to control space.[16] Additionally, space control in the 2030s will require the Space Force to project power beyond traditional Earth orbits—into cislunar and even broader heliocentric gravitational regimes. To support these capabilities, the Space Force will require significant investments in command-and-control systems and domain awareness sensors.[17]

Layered on top of these missions—space control and space support to terrestrial forces—is an enhanced missile defense mission directed by the president's executive order on the "Golden Dome."[18] With Space Force General Michael Guetlein put in charge of managing Golden Dome efforts, it is clear that missile defense will be a central focus of this administration's agenda for the Space Force. In the short term, this mission will rely on improved space-based sensors to provide warning, characterization, tracking, and discrimination of a variety of aerospace threats. In the medium term, the Space Force may be tasked with fielding space-based interceptors to engage missile threats.

12. "Defense Primer: National Security Space Launch Program," Congressional Research Service, last updated April 28, 2025, https://www.congress.gov/crs_external_products/IF/PDF/IF12900/IF12900.3.pdf.
13. Richard Tribou, "SpaceX Scoops up Another National Security Launch While ULA Faces Scrutiny," ScienceX, June 2, 2025, https://phys.org/news/2025-06-spacex-scoops-national-ula-scrutiny.html.
14. Bonnie L. Triezenberg, et al., "Assessing the Impact of U.S. Air Force National Security Space Launch Acquisition Decisions," RAND, 2023, vi, https://www.rand.org/content/dam/rand/pubs/research_reports/RRA2800/RRA2843-1/RAND_RRA2843-1.pdf.
15. C. Todd Lopez, "Space Force's Fundamental Role: Space Superiority," US Department of Defense, March 5, 2025, https://www.defense.gov/News/News-Stories/Article/Article/4102663/space-forces-fundamental-role-space-superiority.
16. "Space Force Doctrine Document 1," US Space Force, April, 2025, 21, https://www.starcom.spaceforce.mil/Portals/2/Space%20Force%20Doctrine%20Document%201%20FINAL_4Apr25.pdf.
17. Deptula and Gunzinger, "Air Force and Space Force Vectors for the Incoming Trump Defense Team," 12.
18. "The Iron Dome for America," White House, January 27, 2025, https://www.whitehouse.gov/presidential-actions/2025/01/the-iron-dome-for-america/.

What are the resourcing gaps that need to be closed to deliver those capabilities?

The Space Force needs significant additional resources to accomplish its goals of being lethal enough to gain and maintain control of space, both to deny the benefits of space power to adversaries and to provide the critical space-based effects that the rest of the joint force relies on. The current fiscal year 2026 defense appropriations bill provides only $29 billion in funding for the Space Force, despite the Space Force's budget request of nearly $40 billion.[19] Of that budget, 78 percent goes toward delivering capabilities for the joint force—meaning the Space Force's budget to fight for control of space is woefully insufficient.[20]

The importance of the Space Force to the rest of the joint force demands major growth in resourcing, not stagnation. The previous secretary of the Air Force stated that the Space Force budget needed to "double or triple over time to be able to fund the things we're actually going to need to have."[21] Other assessments echo this: for instance, the National Security Space Association argues that the budget should double to approximately $60 billion by 2030, while the Mitchell Institute recommends annual real increases of 10 to 15 percent per year in real terms over the next five years—which would bring the total budget to about $48 billion by 2030.[22]

The Atlantic Council's *Forward* Defense program conducted a brief resourcing drill using the fiscal year 2025 president's budget request as a baseline (the only baseline available at the time of writing). In this exercise, we reallocated funds to accelerate investments in space access, space control, domain awareness, and command-and-control capabilities—while keeping the overall defense budget within 5 percent of its current level. The results showed an increase in Space Force funding of $15 billion over the fiscal year 2025 baseline request, totaling $44 billion in fiscal year 2026. That level of growth was sustained across the remainder of the Future Years Defense Program (FYDP). Many of these costs could be offset by targeted force structure cuts by the other services. Examples include divesting an Army armored brigade combat team, a Stryker brigade combat team, one *Nimitz*-class carrier, the third *Ford*-class carrier, and selected smaller cuts from the Air Force.[23] These reductions were not arbitrary[24]—and were in line with what other contributors to the Atlantic Council's National Defense Strategy Project have argued.[25] Ideally, Congress would increase the defense budget so as not to induce risk in other domains.

The presidential priority on implementing Golden Dome adds additional complexity to these calculations. The president has stated that he expects Golden Dome to cost $175 billion, a partial, initial estimate that some outside analysts have concluded to be a dramatic underestimate of what it would cost to implement the most ambitious vision for Golden Dome.[26] While the $24 billion in supplemental funding for Golden Dome in the

19. "A Bill Making Appropriations for the Department of Defense for the Fiscal Year Ending September 30, 2026, and for Other Purposes"; Robert S. Wilson, "FY 2025 Defense Space Budget: Continued Emphasis on Proliferation under a More Constrained Top Line," Center for Space Policy and Strategy, June 2024, 2, https://csps.aerospace.org/sites/default/files/2024-06/FY25BudgetBrief_20240605.pdf; "Department of the Air Force President's Budget Request FY26." Financial Management & Comptroller. Accessed July 15, 2025. https://www.saffm.hq.af.mil/FM-Resources/Budget/Air-Force-Presidents-Budget-FY26/.
20. Mikayla Easley, "Saltzman: Space Force Underfunded for Space Control, Other New Missions," Defensescoop, May 21, 2025, https://defensescoop.com/2025/05/21/saltzman-space-force-underfunded-space-control-budget/.
21. Courtney Albon, "Securing US Space Assets Is Busting the Air Force Budget, Kendall Says," DefenseNews, August 27, 2024, https://www.defensenews.com/space/2024/08/27/securing-us-space-assets-is-busting-the-air-force-budget-kendall-says/.
22. "Accelerate or Lose: Double Down on the Space Force Budget," National Security Space Association, March 2025, https://nssaspace.org/wp-content/uploads/2025/03/Accelerate-or-Lose.pdf; Greg Hadley, "Advancing in Space, China Poses Growing Threat, USSF Leaders Warn," *Air & Space Forces*, March 28, 2024, 11, https://www.airandspaceforces.com/ussf-leaders-china-space-threaten-us/.
23. Analysis conducted using: "Welcome to the Defense Futures Simulator," American Enterprise Institute, last visited July 11, 2025, https://defensefutures.aei.org/. Exact data inputs can be provided by contacting Aaron Brady at abrady@atlanticcouncil.org.
24. Travis Sharp, Casey Nicastro, and Evan B. Montgomery, "Relook Playbook: Defense Budgeting Insights from a CSBA Rebalancing Exercise," Center for Strategic and Budgetary Assessments, April 2, 2025, https://csbaonline.org/research/publications/relook-playbook-defense-budgeting-insights-from-a-csba-rebalancing-exercise/publication/1.
25. "The National Defense Strategy Project," Atlantic Council, July 3, 2025, https://www.atlanticcouncil.org/in-depth-research-reports/report/the-national-defense-strategy-project/.
26. "Trump Announces Concept for 'Golden Dome' Missile Defense Program in the U.S.," PBS, May 20, 2025, https://www.pbs.org/newshour/world/watch-trump-announces-concept-for-golden-dome-missile-defense-program-in-the-u-s.

recently passed budget reconciliation bill is welcome,[27] such supplemental funding cannot be expected to recur annually. If Golden Dome funding must compete with other critical Space Force budget lines—such as those essential for space control and space support to terrestrial forces—the overall budget outlook for space becomes even more uncertain.

In short, there is not a single path to achieving the required levels of US space power. But if policymakers want the Space Force to be sufficiently lethal to win in space and capable of delivering critical support to the rest of the joint force, investment levels must increase substantially. Space Force funding should grow by at least 10 percent annually—though 15 to 20 percent is more likely needed. Anything less undermines the warfighting capability of the entire joint force.

The strategic risks of not making these investments—or relying too heavily on commercial solutions

To this point, this issue brief has not delved deeply into the adversary actions necessitating these investments or the ramifications of rapidly expanding commercial space capabilities. Yet, these two factors represent the most significant strategic risks should the United States fail to make required space investments.

First, China and Russia are deeply committed to contesting—and, indeed, striving to deny—US and allied use of space in the event of conflict. China, in particular, has been developing the necessary space capabilities to do so for decades. In the last decade alone, China has increased its on-orbit assets by over 500 percent and placed over two hundred satellites in orbit each year since 2023.[28] According to deputy chief of space operations for intelligence Major General Gregory J. Gagnon, over half of those satellites are dedicated to sensing—tracking US and allied forces operating in the Indo-Pacific—and supporting Beijing's expanding network of ISR satellites that enable its "kill webs."[29] The vast array of warfighting assets China is putting in orbit indicate that Beijing is preparing for major conflict in and through space. Failing to invest significantly in space capabilities—or even just delaying those investments—could be catastrophic. Failure to maintain viable space forces both reduces overall US deterrence and, if deterrence fails, presents a major risk to US forces. Mitigating this risk requires making the investments described above.

Second, commercial space capacity is essential to US space power. Heavy spacelift, SATCOM, satellite control, and space domain awareness are just some of the capabilities that US companies currently provide—or are well-positioned to offer—either as services or off-the-shelf capabilities. The United States should leverage the considerable advantages of its robust space industry by procuring services and capabilities whenever possible. However, overreliance on a single provider or outsourcing of mission-critical capabilities could create an unacceptable concentration of power outside of government control. The DoD should strive to strike a balance between owning critical capabilities, incentivizing competition in the market for other commercial entities to develop alternative or new space capabilities and services, and ensuring that service contracts for dual-use capabilities remain in place—even during conflict.

Conclusion

Space power is vital to the lethality of the entire joint force. The DoD's future warfighting concepts rely heavily on effects from space. The current Space Force budget is insufficient to fight for space superiority, thereby putting the effectiveness of the rest of the US military in jeopardy. Resolving this problem requires increasing the Space Force budget by billions of dollars. If Congress is unwilling to increase the defense topline to make these investments, the importance of space is so significant that the DoD should make the necessary divestments from other parts of the military to resource the Space Force. Deterring the next war—and winning it if deterrence fails—requires a powerful Space Force fully resourced to succeed.

27. Congress.gov. «Golden Dome: Funding in the 2025 Reconciliation Law (H.R. 1; P.L. 119-21).» July 22, 2025. https://www.congress.gov/crs-product/IN12576.
28. Hadley, "Advancing in Space, China Poses Growing Threat, USSF Leaders Warn"; "Annual Number of Objects Launched into Space," Our World in Data, last visited July 11, 2025, https://ourworldindata.org/grapher/yearly-number-of-objects-launched-into-outer-space?country=~CHN.
29. Hadley, "Advancing in Space, China Poses Growing Threat, USSF Leaders Warn."

Author biography

E. Aaron Brady is a US Air Force officer and A-10 instructor pilot with more than 2,500 flight hours currently serving as a national defense fellow at the Atlantic Council. The views expressed in this brief represent the personal views of the author and are not necessarily the views of the Department of Defense, the Department of the Air Force, the Air University, or any other US government agency.

Clementine Starling-Daniels is the director and resident fellow of the Atlantic Council's *Forward* Defense program housed within the Scowcroft Center for Strategy and Security. She leads a team of staff and fellows focused on US and global defense issues, ranging from space security, nuclear deterrence, and military operations, to defense industry and innovation. Originally from the United Kingdom, she previously worked in the UK Parliament on NATO, European security, and defense issues. She received her BS from the London School of Economics and her MA from Georgetown University.