**Headline:** The Inevitable Militarization of Space?

**Teaser:** For decades, international treaties and diplomatic pressure largely constrained the militarization of space. But in the 2020s, open defiance has replaced subtle circumvention, and the prospect of full-scale weaponization is no longer theoretical.

By John P. Ruehl

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**[Article Body:]**

President Donald Trump’s plans to build a space-based Golden Dome missile defense shield have drawn immediate criticism from China, which has framed it as a [renewed American push to “weaponize space.”](https://abcnews.go.com/International/trumps-golden-dome-risks-weaponization-space-china/story?id=122022810) This program, announced in an [executive order](https://www.defense.gov/News/Releases/Release/Article/4193417/secretary-of-defense-pete-hegseth-statement-on-golden-dome-for-america/) signed in January 2025, echoes former President Ronald Reagan’s 1980s Strategic Defense Initiative, or “[Star Wars](https://www.nationaldefensemagazine.org/articles/2025/1/28/just-in-trump-revives-reagans-star-wars-missile-defense-aspirations),” which was never completed but is believed to have pressured the Soviet Union into a costly arms race. Whether the Golden Dome will meet the same fate or move beyond rhetoric remains to be seen.

Regardless of its future feasibility, the president’s announcement marks another departure from the vision of space as a peaceful domain. Aside from the U.S. Air Force’s anti-satellite (ASAT) missile test [in 1985](https://nationalinterest.org/blog/reboot/how-us-air-force-killed-satellite-missile-1985-181451) and the abandoned Star Wars program, treaties like the [Limited Test Ban Treaty](https://history.state.gov/milestones/1961-1968/limited-ban) (1963), [the Outer Space Treaty](https://en.wikipedia.org/wiki/Outer_Space_Treaty) (1967), and [the Moon Agreement (1979)](https://en.wikipedia.org/wiki/Moon_Treaty) helped restrain space militarization during the Cold War. In the 1990s, multinational projects like the [International Space Station](https://issnationallab.org/about/iss-national-lab-overview/iss-history-timeline/) further reinforced a vision of international cooperation under U.S. leadership.

As a result, public discussion of space weapons remained largely restricted, even as governments quietly advanced their capabilities. That began to change [in 2007](https://www.nytimes.com/2007/01/18/world/asia/18cnd-china.html), when China shocked observers by using a missile to destroy its own satellites, followed by a similar U.S. Navy test [a year later](https://www.thespacereview.com/article/4198/1). These events signaled a clear break from past restraint and kick-started a new space race. In place of the Cold War’s bipolar competition, the 2020s have seen a more multipolar and militarized space race taking shape.

**U.S.**

The 2019 reorganization of U.S. space branches marked a turning point in Washington’s military approach to space. It [created the U.S. Space Force](https://www.npr.org/2019/12/21/790492010/trump-created-the-space-force-heres-what-it-will-do) for training and equipping personnel, [and reestablished](https://www.rand.org/pubs/research_reports/RRA2566-1.html) the U.S. Space Command, responsible for operational missions. NASA, though a civilian agency, continues to support military objectives through dual-use technologies and interagency coordination, while the White House’s [National Space Council](https://bidenwhitehouse.archives.gov/spacecouncil/) also helps shape policy.

Trump’s second term has seen the Space Force [intensify](https://responsiblestatecraft.org/space-force/) its rhetoric on space conflict, casting doubt on the [Artemis Accords’](https://www.space.com/artemis-accords-explained) stated peaceful intentions declared in 2020. In April 2025, General Stephen Newman Whiting, head of Space Command, [publicly called](https://www.defenseone.com/threats/2025/04/us-needs-weapons-space-spacecom-head-says/404393/) for deploying weapons in space, according to Defense One. Meanwhile, General B. Chance Saltzman, the Space Force’s chief of space operations, [outlined six types](https://arstechnica.com/features/2025/03/what-is-space-war-fighting-the-space-forces-top-general-has-some-thoughts/) of counterspace capabilities during the Air & Space Forces Association Warfare Symposium in March 2025; three ground based (kinetic missiles, directed energy, and jamming), and the same three methods adapted for use from satellites in orbit.

In April, the Space Force [released](https://www.defensenews.com/space/2025/04/17/new-space-force-warfighting-framework-sharpens-weaponization-plans/) a new document titled [Space Warfighting](https://www.spaceforce.mil/Portals/2/Documents/SAF_2025/Space_Warfighting_-_A_Framework_for_Planners_BLK2_(final_20250410).pdf), which provides a framework to guide military planning in the largely untested environment. The focus remains on Earth’s orbit, broken down into low, medium, and geostationary orbit, where most satellites operate. The unmanned Boeing X-37B spacecraft, launched in 2010 by the Pentagon, is just one secretive military project in space. It stayed in orbit [for more than 900 days](https://www.space.com/x-37b-military-space-plane-900-days-orbit) from 2020 to 2022, raising concerns over U.S. ambitions in co-orbital warfare and its ability to tamper physically with other satellites.

Private industry has long [been integral to](https://reason.com/2017/07/23/missing-title-in-rtf/) American space capabilities, and a new wave of companies is expanding that role. Elon Musk’s Starlink, designed as a civilian internet service, has become a [critical asset](https://www.politico.eu/article/ukraine-stuck-with-elon-musk-starlink-satellite-internet/) for Ukraine’s military during its war with Russia. Meanwhile, firms like L3Harris [have repurposed](https://www.militaryaerospace.com/sensors/article/14304014/l3harris-technologies-space-surveillance-satellites-high-orbit) commercial satellite sensors for military surveillance and tracking. The Commercial Augmentation Space Reserve (CASR), initiated by the Department of Defense [in 2024](https://www.washingtontechnology.com/opinion/2024/06/new-space-race-why-military-wants-partner-private-sector/397653/), aims to integrate with the private sector for space-based operations.

Beyond Earth’s orbit, the cislunar space between the Earth and the moon is emerging as a major zone of competition. The Air Force Research Laboratory’s (AFRL) “[Primer on Cislunar Space](https://www.afrl.af.mil/Portals/90/Documents/RV/A%20Primer%20on%20Cislunar%20Space_Dist%20A_PA2021-1271.pdf?ver=vs6e0sE4PuJ51QC-15DEfg%3D%3D)” in 2021 identified the region as a growing military priority, and the Pentagon established the [19th Space Defense Squadron](https://www.airandspaceforces.com/new-report-space-force-funds-personnel-cislunar/) to monitor activity in cislunar space and regions beyond traditional satellite orbits. AFRL is also developing the [Oracle-M spacecraft](https://www.space.com/space-exploration/satellites/us-space-force-test-fires-thrusters-for-moon-surveillance-spacecraft) to track objects in cislunar orbit, and completed thruster and ground systems tests in March and April 2025, respectively, and is now moving toward launch readiness reviews.

While [some experts argue](https://csps.aerospace.org/sites/default/files/2024-05/Wilson_HighGround_20240416.pdf) that the strategic value of cislunar space is overblown, the moon itself is increasingly seen through a militaristic lens. NASA plans to return U.S. astronauts to the moon [by 2027](https://www.smithsonianmag.com/smart-news/nasa-pushes-back-astronauts-return-to-the-moon-to-2027-with-the-next-artemis-program-flight-slated-for-2026-180985602/), and the Defense Advanced Research Projects Agency’s (DARPA) NOM4D program [aims to study](https://www.politico.com/news/2022/03/12/space-force-moon-pentagon-00016818) how lunar materials could be utilized for future military use. The Space Force and the AFRL are also testing a lunar reconnaissance satellite called the [Defense Deep Space Sentinel](https://breakingdefense.com/2020/11/space-force-afrl-to-demo-mobile-lunar-spy-sat/) to “demonstrate operations in lunar orbit, including surveilling the lunar surface,” according to the news organization Breaking Defense.

But not everyone is convinced about the reasoning for these developments. According to the co-director of the Outer Space Institute [Aaron Boley](https://thebulletin.org/premium/2022-01/cis-lunar-space-and-the-security-dilemma/), “there is no current need for debris removal in cislunar space, and there is unlikely to be any such need for decades to come,” stated a 2022 article in the Bulletin of the Atomic Scientists.

Paul Szymanski of the Space Strategies Center stated in a [2023 article](https://www.space.com/military-moves-on-the-moon) in Space.com that companies are planning to provide “cell phone service on the moon and the Air Force Research Lab is developing several programs, such as space surveillance for the far side of the moon. None of this makes sense, unless there is some other not publicly known factor that has changed everyone’s attitudes.”

**Other Countries**

With help from private companies, the U.S. is at the [forefront](https://idstch.com/space/countries-advancing-space-weapons-for-space-warfare-the-emergence-of-a-new-frontier/) of space militarization, though it faces growing competition from other countries. Its former Cold War competitor, Russia, brought its “air force and the… Aerospace Defense Forces under one unified command,” of Aerospace Forces (VKS) in 2015, [according](https://www.themoscowtimes.com/2015/08/03/russian-military-merges-air-force-and-space-command-a48710) to the Moscow Times. Russia displayed its ASAT capabilities in [November 2021](https://www.armscontrol.org/act/2022-03/features/russias-anti-satellite-weapons-asymmetric-response-us-aerospace-superiority), when it destroyed one of its defunct satellites.

Just before it invaded Ukraine in February 2022, [Russia launched](https://breakingdefense.com/2024/05/is-russias-cosmos-2553-satellite-a-test-for-a-future-orbital-nuclear-weapon/) the Cosmos 2553 satellite into a high, radiation-heavy orbit around 2,000 km above Earth, a zone rarely used by communications or observation satellites. U.S. officials believe it may be connected to a Russian project for a space-based nuclear weapon. In 2024, [reports emerged](https://www.csis.org/analysis/there-path-counter-russias-space-weapons) that Russia was developing a weapon that could disable hundreds of satellites using “radiation effects or the resulting electromagnetic pulse.”

Also in 2024, [the U.S. accused](https://www.cnn.com/2024/05/21/politics/us-assesses-russia-launched-counter-space-weapon/index.html) Russia at the UN Security Council of launching a satellite capable of attacking other satellites. Experts suggested this satellite was [part of a series](https://www.csis.org/analysis/there-path-counter-russias-space-weapons) of similar Russian satellites launched over several years that may carry kinetic projectile weapons. Then, in March 2025, U.S. officials observed multiple Russian satellites “work together to surround and isolate another satellite that was positioned in low earth orbit, demonstrating how they could potentially target enemy spacecraft in a future conflict,” [stated](https://www.cnn.com/2025/03/16/politics/pentagon-monitoring-russia-china-space) an official in a CNN article.

China, however, has [overtaken Russia](https://www.youtube.com/watch?v=wSbP13DKWZ0) since the end of the Cold War to become the U.S.’ primary competitor in space. In [December 2024](https://www.cnn.com/2025/03/16/politics/pentagon-monitoring-russia-china-space), several Chinese satellites conducted what U.S. officials described as “[advanced patrols and advanced attack](https://thedebrief.org/u-s-officials-warn-of-arms-race-in-orbit-as-adversaries-test-space-weapons/)”approaches, showing their ability to physically disable nearby satellites. A senior U.S. general later confirmed that China is [testing satellites](https://www.defensenews.com/space/2025/03/18/china-demonstrated-satellite-dogfighting-space-force-general-says/) capable of “dogfighting maneuvers,” also using multiple spacecraft.

China’s missile capabilities have also advanced rapidly. In 2021, [the country tested](https://www.iiss.org/publications/strategic-comments/2022/chinas-2021-orbital-weapon-tests/) several hypersonic weapons faster than Mach 5—or five times the speed of sound—using a Fractional Orbital Bombardment System (FOBS), in trials that surpassed anything the U.S. has publicly demonstrated. In each case, China launched a payload into low earth orbit that circled part of the globe before releasing a hypersonic glider, which struck a target in China. In one test, the glider released a [second missile](https://www.armscontrol.org/act/2022-01/news/chinese-hypersonic-glider-said-fire-projectile) during its descent.

These tests laid the groundwork for later claims of more sophisticated, space-based strike systems. In April 2025, Chinese military officials [claimed](https://interestingengineering.com/military/china-hypersonic-missile-gets-mach-20-speed) they can launch missiles from space using various platforms, including reentry glide vehicles capable of reaching up to 13,000 miles per hour. This all comes as China plans to land its own astronauts on the moon [by 2030](https://www.space.com/the-universe/moon/how-china-plans-to-put-astronauts-on-the-moon-by-2030-video).

[China](https://www.defenseone.com/threats/2025/04/how-china-expanding-its-anti-satellite-arsenal/404283/), [Russia](https://fedscoop.com/china-russia-may-soon-field-more-capable-counterspace-weapons-dia-says), and the U.S. have all developed Earth-based lasers capable of blinding satellites. As these powers advance their arsenals, other nations are building up their own. Among the newcomers, India has demonstrated its own ASAT capabilities [in 2019](https://www.thespacereview.com/article/4556/1) when it shot down one of its satellites.

New power blocs are also taking shape. Traditional coordination between the U.S. and allies in Europe and Japan now faces growing competition from China and its partners. The China and Russia-led International Lunar Research Station project [aims](https://www.dw.com/en/china-and-russia-plan-to-build-nuclear-power-station-on-moon/a-72565465) to build a lunar base by 2035. Nearly a dozen other countries have already pledged support.

**Managing Space Militarization Risks Is the Way Forward**

While Washington seeks to preserve its lead in space, that very dominance can make it vulnerable. Russia, less dependent on space infrastructure, is investing in systems designed to trigger cascading effects. Chinese strategists, [meanwhile, believe](https://www.airuniversity.af.edu/Portals/10/SSQ/documents/Volume-13_Issue-4/Szymanski.pdf) the U.S. would win a prolonged war in space but may be vulnerable to a sudden first strike, influencing their planning.

Debris from previous ASAT tests by the U.S., China, and Russia already threatens spacecraft and satellites. As more countries acquire offensive space capabilities, the vision of a peaceful and cooperative exploration of space becomes harder to realize. A more realistic approach may be to acknowledge space militarization and focus on managing risks. In preparing for conflict, humanity may still develop technologies and infrastructure that ultimately serve the public good.