

# Fortifying Stability in Space

## Establishing the US Space Force

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No, the US Space Force (USSF) is not a joke. While many people negatively associate the USSF with former President Donald Trump and mock its existence in pop culture (thank you Netflix), the nation's newest service in more than 70 years is working diligently to fortify stability in space. When I joined the US Air Force, I never thought space would become a new service, and it came as a surprise to all of us when the USSF was established in 2019 with the enactment of the FY20 National Defense Authorization Act. The United States now, more than at any point in its history, depends on space systems for its national security—and much more so than any other country.<sup>1</sup> While the USSF was established in 2019, for the past 60 years, space capabilities have become increasingly essential to the way a modern military conducts operations. The Joint Force community relies on space for weather, surveillance, intelligence, communications, early warning, and positioning, navigation, and timing services. Space capabilities have many touchpoints with not only the military but also everyday citizens. When you wake up in the morning and check the weather on your smartphone, you can thank the USSF (among others) for that capability.

The USSF plays a crucial role in the comprehensive defense strategy of integrated deterrence, aimed at preventing conflicts through the coordinated utilization of all aspects of national power. This includes joint force actions across various domains, working in collaboration with our valued allies and partners.<sup>2</sup> In the early days of establishing the USSF, there was one member: the Chief of Space Operations (CSO). I had been asked to come over to help the new service, and I was wearing all the hats except the S1 (Personnel). So that was S2 (Intelligence), S3 (Operations), S4 (Logistics), S5 (Strategy and Requirements), S6 (Cyber and Communications), S8 (Plans and Programming), S9 (Analysis), and S10 (Nuclear). We had a lot of work to do to design the force, establish offices and processes—all to ultimately organize, train, and equip Guardians to maintain and preserve US freedom of operations in space. I had many roles in executing the CSO's Planning Guidance (CPG) that provided the first strategic direction for the USSF as a lean, agile, and

<sup>1</sup> Forrest E Morgan, *Deterrence and First-Strike Stability in Space: A Preliminary Assessment* (Santa Monica, CA: RAND, 2010), III, <https://www.rand.org/>.

<sup>2</sup> "Fact Sheet: 2022 National Defense Strategy" (fact sheet, DOD, 2022), <https://media.defense.gov/>.

innovative service—designed to move at a speed to stay ahead of adversaries.<sup>3</sup> Prior to 2014, there was little understanding of the threats posed by our adversaries in space. However, the announcement of the Space Enterprise Vision by the Air Force Space Command marked a significant turning point as it explicitly acknowledged and tackled vulnerabilities within the space architecture.<sup>4</sup> Prior to that point, the space domain was generally considered a benign environment, affording us the luxury of dedicating ample time to developing sophisticated satellites without prioritizing defensive capabilities. It proved surprisingly challenging to convey to Pentagon leadership the extent of vulnerability our systems faced from adversaries' threats. No, to be totally honest, it was like an explosive knife fight for funding, human resources, and even physical workspace within the Pentagon—all in the pursuit of modernizing our space capabilities.

In 2016, the knife fight began for me as we introduced concepts for a resilient space architecture to the Pentagon, initiating an extensive series of meetings to disseminate and discuss these ideas. Throughout this process, we engaged in hundreds of sessions to foster understanding and gather valuable feedback. Educating senior leaders that we had to adjust our acquisition strategies to create a space infrastructure that could take a punch and continue to operate under attack was met with brick-walled resistance. However, once we conducted a comprehensive cost-comparison analysis on adopting new technology, we successfully halted the acquisition of Space-Based Infrared System (SBIRS) satellites 7 and 8. This allowed us to redirect our focus toward acquiring the necessary technology for building resilient space capabilities.

The Space Force is now shifting away from the outdated SBIRS system and embracing a modernized approach. This entails developing a multi-orbit, distributed, and proliferated constellation of satellites that offer enhanced capabilities and improved survivability, all while achieving cost effectiveness. Specifically, the Next-Generation Overhead Persistent Infrared (Next-Gen OPIR) will serve as a direct placement for the existing SBIRS system, ensuring the continued provision of critical capabilities such as missile warning, missile defense, battlespace awareness, and technical intelligence. Designed to withstand and counter emerging threats from adversaries in space, Next-Gen OPIR offers enhanced survivability. Furthermore, this advanced system will not only track emerging infrared (IR) threats in space but also expand its scope to monitor and track emerging IR

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<sup>3</sup> Chief of Space Operations' Planning Guidance (Washington, DC: USSF, 9 November 2020), <https://media.defense.gov/>.

<sup>4</sup> "Hyten announces Space Enterprise Vision," Air Force Space Command Public Affairs, 13 April 2016, <https://www.af.mil/>.

threats on land and in the air. This broader coverage contributes to bolstering our overall situational awareness and enables more effective response strategies.

In 2021, we established the Space Warfighting Analysis Center (SWAC) as a pivotal force in shaping our space acquisitions strategy. The SWAC's primary objective is to develop and deliver authoritative Force Design guidance to the USSF. These activities performed by SWAC are part of a larger capabilities development ecosystem that encompasses requirements generation, streamlined governance, unity of effort across acquisitions, and integrated test and evaluation.

Despite facing criticism from Congress as a potential redundancy, the SWAC core responsibilities involve conducting analysis, modeling, wargaming and experimentation. These efforts are essential in formulating operational concepts and providing crucial Force Design guidance.<sup>5</sup> Force Design serves as the framework to identify and integrate a comprehensive suite of capabilities that fulfill our key responsibilities, which include preserving freedom of action in space, enabling Joint Force lethality, and offering independent technology options.

Furthermore, the SWAC plays a vital role as an innovation expediter facilitating partnerships with industry to accelerate our modernization efforts. Employing a model-based systems engineering (MBSE) approach, SWAC enables comprehensive assessments of system and architecture description, concept designs, and affordability analyses throughout the lifecycle of Force Design. This systematic approach ensures informed decision-making and efficient resource allocation.<sup>6</sup>

From my perspective, a potential conflict with China could manifest without traditional shots being fired and instead take the form of a purely cyber and space war. Congress now recognizes China as a pacing threat in the space domain, and both China and Russia consider space as a critical war-fighting domain. While the USSF's USD 30-billion budget doubled from FY20 to FY24, and the USD 2.6-billion research, development, test, and evaluation (RDT&E) budget increased 16 percent, there are challenges to rapidly acquiring technology that the US Air Force has been working on for years. Recognizing these challenges, the Honorable Frank Calvelli, Assistant Secretary of the Air Force for Space Acquisition and Integration, released a memorandum on 31 October 2022.<sup>7</sup> The memorandum aims to solidify the Department of the Air Force's priorities, philosophy,

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<sup>5</sup> Theresa Hitchens, "Space Force Vice Argues Value Of Embattled Analysis Center," *Breaking Defense*, 28 July 2021, <https://breakingdefense.com/>.

<sup>6</sup> "USF SWAC Business Fair," Sam.gov, 10 September 2021, <https://sam.gov/>.

<sup>7</sup> "Air Force President's Budget FY24," Financial Management & Comptroller, 2023, <https://www.saffm.hq.af.mil/>.

and tenets for space acquisition.<sup>8</sup> It emphasizes the need to prioritize speed in acquisitions, establish resilient space architectures, and integrate the space domain with other domains to provide the Joint Force with a strategic advantage against potential adversaries.

In addition to energizing our acquisitions efforts, we have embarked on strategic partnerships with like-minded countries to enhance our space capabilities. As one example, in November 2022, I had the amazing opportunity to travel to Australia and engage with our esteemed Australian counterparts.<sup>9</sup> During this visit, I was honored to be invited as a speaker at the Australian Strategic Policy Institute's Space Masterclass and National Security Space Dinner, held at the iconic Sydney Opera House. The audience comprised representatives from Australia, Japan, Canada, the United States, and the United Kingdom, and I had the privilege of discussing defense perspectives on the significance of space.

An essential component of the successful partnership between the United States and Australia is the Space Surveillance Telescope (SST) program. In 2013, both countries agreed to relocate the SST from White Sands Missile Range in New Mexico to Naval Communication Station Harold E Holt in Western Australia. This move not only added a new vantage point for space domain awareness in the Southern Hemisphere but also solidified the collaborative efforts between our nations in enhancing space surveillance capabilities.<sup>10</sup>

As we press ahead in the space domain, the international community increasingly recognizes the importance of space to military operations. Space underpins NATO's ability to navigate and track forces, maintain robust communications, detect missile launches, and ensure effective command and control. Notably, more than half of active satellites orbiting the Earth belong to NATO members or companies based within their territories.

In 2019, NATO adopted the organization's *Space Policy*, acknowledging space as a distinct operational domain, alongside air, land, maritime and cyberspace.<sup>11</sup> This policy serves as a guiding framework for NATO's approach to space and ensures the Alliance receives vital space-based support for its operations and missions, including areas such as communications, navigation, and intelligence.

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<sup>8</sup> Frank Calvelli, Assistant Secretary of the Air Force, to Department of the Air Force Space Acquisition Workforce, memorandum, subject: Space Acquisition Tenets, 31 October 2022, <https://www.safsq.hq.af.mil/>.

<sup>9</sup> Secretary of the Air Force Public Affairs, "Space Force Builds Partnership with Australia," *MilitarySpot.com*, 6 December 2022, <https://www.militaryspot.com/>.

<sup>10</sup> Sandra Erwin, "Space surveillance telescope developed by the U.S. begins operations in Australia," *SpaceNews*, 30 September 2022, <https://spacenews.com/>.

<sup>11</sup> North Atlantic Treaty Organization, "NATO's overarching Space Policy," 17 January 2022, <https://www.nato.int/>.

During the February 2023 Defence Ministers' meeting, 16 NATO allies, together with NATO invitees Finland and Sweden, agreed to develop the Alliance Persistent Surveillance from Space (APSS) initiative. This significant step will foster enhanced cooperation among NATO members in the realm of space-based surveillance, ultimately supporting the implementation of NATO's overarching *Space Policy*.<sup>12</sup>

Discussing the international community and space would be incomplete without addressing the situation in Ukraine. Our dedicated Guardians work tirelessly around the clock to ensure that our space capabilities remain operational not only for our nation and the Joint Force but also for the entire world. It is well understood by our potential adversaries that space plays a critical role in empowering military operations, as evidenced by the targeted attacks on space capabilities during the ongoing conflict in Ukraine.

To support Ukraine, the United States, along with its allies and partners, has been providing Kyiv with various GPS-enabled weapon systems. The utilization of space capabilities, including commercial ones, has played a crucial role in alerting the world to imminent attacks, maintaining communication networks within Ukraine, and sharing intelligence to strengthen the resolve of our alliance.

Meanwhile, Russia is actively pursuing space attack capabilities with the aim of neutralizing or denying space-based services, both military and commercial. Moscow perceives space-enabled information collection and transmission as pivotal in deciding the outcome of conflicts. Indeed, the Russian invasion of Ukraine commenced with a Russian cyberattack targeting a commercial satellite network. Furthermore, Russia has attempted to counter Ukraine's use of GPS, communications, and radars through the application of electronic warfare systems. These developments underscore the fact that modern warfare, even in the context of a significant land-based conflict in Eastern Europe, is now multi-domain, incorporating various domains such as cyber, space, and electronic warfare.

The USSF has been presented with an extraordinary opportunity to collaborate with partners in advancing common values, establishing behavioral norms, fostering shared capacity, and aligning military space efforts. Through these partnerships, we aim to create an environment in the space domain that promotes security, stability, and sustainability for all responsible actors.

One of the key ways in which the USSF contributes to shaping norms is by building stronger international partnerships and setting a positive example

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<sup>12</sup> North Atlantic Treaty Organization, "16 Allies, Finland and Sweden launch largest space project in NATO's history," 15 February 2023, <https://www.nato.int/>.

through responsible operations.<sup>13</sup> In February 2022, the United States, alongside Australia, Canada, France, Germany, New Zealand, and the United Kingdom, jointly released the *Combined Space Operations Vision 2031*. This initiative addresses the overarching imperative of promoting responsible space utilization, acknowledging the challenges to space sustainability, the threats posed by technological advancements, and the increasingly comprehensive and aggressive counterspace programs of other nations.

The Vision outlines the overarching purpose of the initiative and highlights its guiding principles. These principles encompass the freedom of use of space, the responsible and sustainable utilization of space, the importance of partnering while respecting national sovereignty, and the commitment to upholding international law. By adhering to these principles, the USSF and its partners strive to shape a cooperative and rules-based framework for space operations that benefits the international community as a whole.

To maintain and preserve US freedom of operations in space, the USSF has established dedicated components to support commanders in regions where potential threats arise. In a ceremony held on 22 November 2022, at Camp H.M. Smith, the USSF officially activated and assigned US Space Forces, Indo-Pacific (USSPACEFOR-INDOPAC) to the US Indo-Pacific Command (USINDOPACOM).

The primary role of USSPACEFOR-INDOPAC is to provide USINDOPACOM with a team of highly skilled space experts. These experts collaborate with allies and partners to integrate space activities into shared operations, activities, and investments. By doing so, USSPACEFOR-INDOPAC enhances the security landscape extending from the Indian Ocean across South and East Asia to the western coast of the United States. Moreover, USSPACEFOR-INDOPAC plays a pivotal role in promoting regional stability and advancing US partnerships within the Indo-Pacific region.

In addition to the establishment of USSPACEFOR-INDOPAC, the USSF has also created two component field commands specifically tailored for US Central Command and US Forces Korea. These commands provide dedicated support and expertise in space-related matters to their respective commands, ensuring the effective integration of space capabilities and operations into their overall strategies and activities.

Space has now taken center stage, and it is truly an exciting time. I am grateful for the opportunity to shed light on how the USSF was established. The impact

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<sup>13</sup> “DoD and Partners Release Combined Space Operations Vision 2031” (press release, DOD, 22 February 2022), <https://www.defense.gov/>.

of space on our daily lives is undeniable, and ensuring the protection of this vital realm is a matter of great importance to me.

However, I would like to circle back to the Netflix series about the Space Force. I must admit that the first few episodes were quite hilarious. Interestingly, it seemed to poke fun at the US Coast Guard more than the Space Force itself. I found it ironic that the show depicted a rivalry between the US Air Force and the Space Force because in reality, the Space Force emerged from the Air Force, and we rely on the Air Force for numerous aspects of our operations. It is truly a genuine partnership within the Department of the Air Force, where collaboration and cooperation are integral to our success. 🌟

### **Lt Gen Nina M. Armagno, US Space Force**

Lieutenant General Armagno is the Director of Staff, Headquarters, US Space Force, the Pentagon, Arlington, Virginia. In this role, she synchronizes policy, plans, positions, procedures, and cross functional issues for the US Space Force headquarters staff.

Lieutenant General Armagno earned her commission and graduated from the US Air Force Academy in June 1988. She is a career space operator with more than 35 years of operational experience. She is the first lieutenant general commissioned in the USSF and is the only person to have commanded both launch wings in the US Air Force. Prior to her current assignment, she was the Director, Space Programs, Office of the Assistant Secretary of Defense for Acquisition. She directed the development and procurement of space programs for the Air Force and crafted program strategies for representing Air Force positions to Headquarters US Air Force, the office of the Secretary of Defense, Congress, and the White House. She has also served as Director of Plans and Policy, US Strategic Command, Offutt Air Force Base, Nebraska. She was directly responsible to the USSTRATCOM Commander for the development and implementation of national security policy and guidance, military strategy, and space and nuclear weapons employment policy and concepts. In addition, she has held command positions at multiple levels, including squadron, group, wing, and installation as well as staff assignments at Headquarters US Air Force, Headquarters Air Force Space Command, Headquarters 14th Air Force and the 381st Training Group, and has served as an Air Force Legislative Fellow in the Office of Congresswoman Ellen Tauscher. Lieutenant General Armagno is a member of the Council on Foreign Relations