

Future of the European space endeavor

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ABSTRACT

Following the recognition of space as one of NATO's domains of engagement in November 2019, the United States established the sixth branch of the US Armed Forces, the Space Force. The clear benefits of maintaining and protecting space infrastructure are driving an increase in global space sector spending. The National Aeronautics and Space Administration's (NASA) budget for 2025, despite cuts, amounted to 25 billion dollars, with a planned expansion of the US Space Force's budget to 71.1 billion dollars in 2027. With the budget of the European Space Agency (ESA) reaching only 8.26 billion euros, it has been unable to establish cheap, reusable ways to put payload into space, curbing European space potential. European Union nations' attempts to protect space infrastructure have been fragmented so far. In order to both boost and secure the European space sector, this paper recommends not only a drastic increase of the ESA budget, but also the creation of a unified space command responsible for safeguarding European space infrastructure.

CONTEXT AND ISSUE STATEMENT

As estimated by the World Economic Forum and McKinsey & Company, the global space sector is going to grow to as much as 1.8 trillion dollars by 2035. It is critical to note that most other branches of the economy also rely on space infrastructure, such as the internet or satellite navigation. In wartime, as shown in the Russian-Ukrainian war, satellite images are being used to implement strategy with more foresight and to observe enemy movements as well as encampments.

Space has become one of the domains of modern warfare. It was recognized as such during the NATO summit in November 2019, and the creation of the US Armed Forces' sixth branch, the Space Force, followed. Following a major military reorganization in April 2024, the People's Republic of China created the People's Liberation Army Aerospace Force. Following this trend, several countries around the globe created separate sub-branches dedicated to space defense, or integrated space defense into the responsibilities of the Air Force. The reusable rockets, such as Falcon or, in the future, Starship, redefine the space economy. Payloads are now cheaper to put into orbit, allowing rapid innovation. It has become crucial that the European Union possesses such launch capabilities, so as not to rely completely on our American allies.

Dangers to space infrastructure only arise. The evolution of Direct-ascent anti-satellite (DA-ASAT) missiles paves the way for the total unusability of orbits critical to the global economy and space exploration. Both the People's Republic of China and the Russian Federation have proven to have such capabilities. The European Union has already undertaken several steps to foster its technological independence. Since the early 2000s, the European Union has been paying into the ESA budget, accounting for 23.4% of the total budget. The creation of the European Union's Agency for the Space Programme in May 2021 also created a way for the Union to fund space activities directly, reaching around 2-2.5 billion euros annually in the 2021- 2027 MFF. Initially tasked with implementing the Union Space Programme, its mandate was expanded under Regulation (EU) 2023/588 with tasks from the Secure Connectivity Programme (IRIS²), and it is now entrusted with executing Union Space Systems and Space Policy Implementation as part of the European Competitiveness Fund.

ANALYSIS

IMPLEMENTATION IN THE UNITED STATES

The US Armed Forces' sixth branch, the Space Force, was established in 2019 under the Department of the Air Force. Its tasks include tracking objects and threats in orbit to prevent collisions, missile warning and defense, satellite operations, and managing space launches that are viewed as national interest. This branch of the US Armed Forces is responsible not only for maintaining the safety of space infrastructure, but it also uses said infrastructure to safeguard national security on Earth. The Space Force addresses the necessity for less bureaucratic and more agile management of the space domain. It relies on a more mission-oriented approach, which is shown in the Deltas, units that are organized around specific missions, such as cyber operations or missile warning. The proposed budget for the US Space Force in 2027 is estimated at 71.1 billion dollars, almost triple the civilian NASA's budget.

IMPLEMENTATION IN THE PEOPLE'S REPUBLIC OF CHINA

The People's Liberation Army's Aerospace Force was established in 2024 under the direct command of the Central Military Commission. It holds similar competences to its American counterpart. The force is being led under the centralized authority of the Chinese Communist Party, under which a vast network of dedicated space infrastructure exists in the form of over 240 military satellites for reconnaissance and communications, the Astronaut Corps, telemetry centers, and strategic sites like the Lop Nur base. The budget of the People's Liberation Army's Aerospace Force is unknown, yet it is safe to assume that China is aiming to possess capabilities similar to those of the United States.

IMPLEMENTATION IN THE EUROPEAN UNION

Since its creation, the European Space Agency, a body outside the European Union, has been a civilian, pacifist organization tasked with space exploration and the expansion of space infrastructure. The definition of pacifism has, however, changed throughout the years, with the implementation of a non-aggression doctrine in 2025. This change brought a deeper focus on dual-use technologies, used both at the all-European and national levels. In recent years, several European countries have chosen to create some form of national space command in order to ensure the safety of national space infrastructure.

France, having the most developed and autonomous military space infrastructure in Europe, created the French Space Command (Commandement de l'Espace - CDE) in 2019, responsible for organizing and conducting military space operations. It handles Space Domain Awareness (SDA), space support for military operations, and action in space. Uniquely in Europe, France has explicitly stated a strategy of "active defense" in space, which includes developing bodyguard satellites equipped with lasers in order to fend off attacks on French assets.

Germany created its dedicated Space Command in July 2021, which is directly subordinate to the German Air and Space Force Command. Unlike France, Germany's military space posture is strictly defensive and observational. Germany has committed to not conducting destructive anti-satellite tests and focuses heavily on civil-military integration. Similar to Germany, Italy's Comando delle Operazioni Spaziali (COS) is a joint military command designed to coordinate the space activities of its armed forces. It focuses on satellite communications, Earth observation, and space situational awareness to support joint military operations.

The current split in space competencies is as follows: ESA is responsible for the creation of new infrastructure and technologies, as well as undertaking space exploration missions. EUSPA's tasks include the use and commercialization of space assets and data, as well as regulation. The defense of said infrastructure is, however, severely fragmented and overlapping. To address this, German Defense Minister Boris Pistorius proposed the creation of a European Space Component Command, which would coordinate EU and NATO space operations, curb redundant capabilities, and reduce strategic dependence on U.S. technologies.

RECOMMENDATIONS

1. Creation of European Space Component Command

This paper strongly supports the creation of a European Space Component Command by the member states. The national fragmentation of space defense not only makes it less reliable, but also more costly. This paper advocates for the creation of an independent body as an EDA Ad Hoc Category B project, the Agency's existing mechanism for voluntary, opt-in cooperation among interested Member States, one that could act quickly and independently in order to protect

European space infrastructure. Its competences should include tracking objects and threats in orbit, satellite operations, and ensuring data access to national militaries.

2. Increased funding toward ESA

This paper recommends an increase in funding towards ESA. In order to develop independent, cheap launch capabilities, the European Commission should allocate enough funding towards ESA programs, so as to match NASA spending in the United States by 2035. As is already proven, investments in the space sector are drivers of innovation and prosperity. The unique financial environment in Europe has held back some of the private investments, meaning that if in this crucial moment more public funding isn't available, the highly specialized workforce will use their talents elsewhere. Public spending results in stability, which is required for space projects that take decades to finish.

3. Greater integration through EUSPA

This paper recommends that the European Council strengthen the competences of the EU Agency for the Space Programme (EUSPA), in order to foster deeper integration of national space programs. Greater integration could be achieved through multinational grants, supporting multinational cooperation on space defense programs. This paper recommends a review of national space defense programs, in order to find space for cooperation.

CONCLUSION

The importance of providing security to space infrastructure cannot be ignored. Although the European Union has undertaken several significant steps in order to foster space innovation and defense, it is still behind in terms of funding and coordination. Several countries are significantly outspending the European Union, and should we strive for technological independence, their input must be matched in the coming years. It is also critical to implement more integrated management of space infrastructure defense. European space infrastructure is interconnected, meaning that if one country's satellites are destroyed, the debris endangers all the satellites around it. Thus, having a space command protecting only national infrastructure is counterproductive, and a unified, all-European command should be implemented.

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