Ready for Lift-Off?

Challenges and Opportunities for Germany's Space Security Policy under the New Federal Government

by Andrea Rotter

Resumé

Kriget i Ukraina belyser rymdens växande strategiska betydelse för säkerhet och försvar, samtidigt som området i sig har genomgått en genomgripande omvandling under de senaste åren. Rymden speglar i allt högre grad geopolitiska rivaliteter och framträder som en viktig arena för vetenskaplig, teknisk, ekonomisk och militär konkurrens. Mot denna bakgrund är det avgörande att den nya tyska regeringen erkänner och tar itu med rymdens övergripande betydelse. Även om koalitionsavtalet mellan kristdemokraterna, kristsociala unionen (CDU/CSU) och socialdemokraterna (SPD) ger anledning till försiktig optimism, finns det betydande utmaningar att övervinna. Bland annat en begränsad samhällelig och politisk förståelse för rymdens betydelse, ett övervägande fokus på de vetenskapliga och ekonomiska aspekterna av den nya rymdkapplöpningen snarare än säkerhetsaspekterna, de senaste nedskärningarna i de nationella budgetarna och pågående tvister mellan ministerierna. Hur dessa utmaningar hanteras kommer att avgöra om Tyskland kan ta en mer beslutsam och ansvarsfull roll i rymdsäkerhetspolitiken.

THE COALITION AGREEMENT for the new German federal government states:

> Spaceflight is a key technology and an important factor in strengthen Germany's defense capabilities in space decisively and without delay. A national space security strategy will be published within the first year of our government.[1]

While recent years have brought notable shifts in Germany's approach to space, Berlin has struggled to fully grasp the broader strategic—and especially security—dimensions of the domain, particularly when compared to the United States or European partners such as France and the United Kingdom.[2] Nevertheless, the policy objectives outlined in the coalition agreement indicate a readiness for a more decisive German role in space, partly based on the growing strategic relevance and transformation of the space domain, the lessons of the war in Ukraine, and the recent, yet intensifying, upheavals in transatlantic relations. Together, these developments highlight the urgent need for Germany to assume greater responsibility for its own security—"whatever it takes,"[3] as Chancellor Friedrich Merz has stated—including in the space domain.

A Conflict-Prone New Space Age

On the one hand, the growing dependency—and consequently, the vulnerability—of digitally connected societies and modern

armed forces has been steadily increasing. In the civilian sector, citizens in Germany rely on space-based services and capabilities on a daily basis, likely without fully appreciating the extent of their dependence. The current infrastructure supporting mobility, reliable communication, and the global economy, as well as financial markets, is just as influenced by satellite-based communication and GPS signals as future technologies like autonomous driving and the Internet of Things. Furthermore, scientific efforts to combat climate change and achieve the United Nations Sustainable Development Goals heavily rely on satellite data, particularly in Earth observation.[4] In the military domain, space-based capabilities have long been considered "critical enablers" of operations, providing early warning, satellite communication (SATCOM), navigation (PNT), and reconnaissance (ISR), which are crucial for mission planning and execution.[5]

On the other hand, a range of trends and factors are driving the transformation and growing complexity of modern space use.[6] "Crowded, congested, contested" have become common terms to describe outer space in the 21st century. While the militarization of space was a key factor during the Cold War, several developments—such as the internationalization, commercialization, and congestion of space—combined with the lack of adequate international regulation shape the current space environment. In addition, strategic rivalries unfolding on Earth and mirrored in orbit, are now contributing to the 'new space age' being significantly more complex, fragile, and potentially conflict-prone.[7] Today, more than 70 countries operate civil and/or military space programs,[8] and the number of objects in space has increased exponentially in recent years, particularly due to commercial actors like Elon Musk's Starlink.[9] States (and private actors) are not only competing for key milestones in civilian space research but also for economic gains in the rapidly growing space market, which is expected reach a global value of $1.8 trillion by 2035.[10]

Around the world, states are consolidating, expanding, and modernizing their military space programs, including the development of counterspace capabilities aimed at preventing adversaries from using space-based assets during conflict.[11] These capabilities range from reversible disruptions of communication or GPS signals and cyberattacks on space systems to more destructive measures, such as kinetic anti-satellite weapons (ASAT).[12] Russia demonstrated the latter in November 2021 by destroying one of its defective satellites with a ballistic missile, creating thousands of pieces of space debris.[13] Additionally, high-powered microwaves or lasers, such as Russia's *Peresvet system*, are designed to disrupt or destroy satellites.[14] Recently, co-orbital systems have raised concerns, including rendezvous and proximity operations, where inspection satellites like Russia's *Luch*-2 approach other satellites in a suspicious manner,[15] or Moscow's reported plans to deploy a nuclear-armed weapon in space.[16] A comprehensive international consensus to curb the arms race that is already taking place beyond Earth's atmosphere seems out of reach.[17]

The First Commercial Space War

The war in Ukraine visibly demonstrates the critical role that space-based technologies play in modern hybrid and conventional warfare. Russia's invasion notably began with a cyberattack on the U.S. satellite communications provider Viasat on

February 24, 2022—an attack that disrupted not only the Ukrainian military's communications but also impacted several thousand wind turbines in Germany.[18] Jamming and spoofing—disrupting or faking communication and GPS signals—have become defining features of the conflict,[19] alongside the unprecedented involvement of commercial providers who supply Kyiv with indispensable satellite-based data and services in its fight against the Russian aggressor.[20] As a result, the Ukraine war has already been dubbed the "first commercial space war",[21] prompting Russia to issue warnings that commercially operated space infrastructure used for military purposes could become legitimate targets for retaliation.[22] This highlights the growing risk of space becoming a battlefield—a scenario no longer considered farfetched. In response—and little known in the public debate—NATO declared as early as 2021 that "attacks on, from, or through space" could activate the Alliance's mutual defense clause under Article 5.[23]

Germany's Promising Foundations

Growing dependencies in an increasingly conflict-prone security environment pose significant security and defense policy challenges for Germany—with a hitherto major factor being a lack of political will. All in all, Germany is well-positioned to navigate the far-reaching transformation of the space domain.

On the one hand, Germany has a promising scientific and industrial base, including leading research institutions like the Fraunhofer Institute for High-Frequency Physics and Radar Techniques, which developed the ground-based GESTRA radar system for monitoring objects in low Earth orbit. While the United States remains the dominant force in the global space industry, Germany's growing space sector, consisting of established companies like Airbus Defense and Space or OHB SE, and a number of start-ups such as Isar Aerospace and Rocket Factory, which specialize in microlaunchers, is internationally competitive in key technologies.[24]

On the other hand, Germany is also widely recognized as a relevant partner in international space security policy. In addition to its involvement in international cooperation within frameworks such as the United Nations, the European Union, and NATO, Germany participates in exclusive, U.S.-led cooperative initiatives like the *Combined Space Operations Initiative* and *Operation Olympic Defender*, which aim to enhance cooperation among capable, like-minded partners and to develop shared strategies for improving resilience and deterrence.[25]

> *The Bundeswehr regards space operations as a permanent task.*

Given Germany's high degree of national dependence on satellite-based services, the Bundeswehr regards space operations as a permanent task (*Dauereinsatzaufgabe*). This includes providing Space Situational Awareness (SSA), protecting critical space infrastructure, supporting military operations, and conducting space operations.[26] To this end, the Bundeswehr established a military Space Command under the leadership of the Air Force in 2021 and operates its own satellite systems for communication (*SATCOMBw*) and radar reconnaissance (*SARah*).[27] In addition, the Bundeswehr aims to procure a satellite constellation similar to Starlink.[28]

A New German Approach to Space?

Against the backdrop of the war in Ukraine, Germany has also begun to reassess its strategic approach to space. In its 2022 National Security Strategy, the former federal government acknowledges:

> For several years now, outer space has become an ever more important part of our security. The safe use of space, especially in the form of satellite communications and navigation as well as earth observation satellites, has become indispensable for many spheres of civilian life. At the same time, the military use of space has become increasingly significant for modern armed forces. The Federal Government will therefore place a stronger focus on space as a strategic dimension and expand its capabilities in this domain.[29]

The German federal government's Space Strategy published in 2023 outlines nine areas of action for Germany's space policy, underscoring that space is a cross-cutting issue of national importance. These priorities range from participation in international missions and research, to various approaches for boosting innovation within Germany's *NewSpace* industry, leveraging satellite data for environmental and climate protection, expanding the Bundeswehr's SSA capabilities, promoting the sustainable use of outer space, and attracting new talent to the sector.[30] While the security dimension of space remains underrepresented in the Space Strategy, Germany's long-overdue first Space Security Strategy offers a crucial opportunity to raise awareness of space-related security risks and to initiate the necessary measures to enhance the country's overall security and defense readiness—particularly, and necessarily, in the space domain.

Although the post-Ukraine *Zeitenwende* (watershed moment) has prompted significant shifts in Germany's broader security and defense policies, the development of its approach to space has been markedly less tangible.[31] However, Germany cannot achieve its self-imposed goal of being "a guarantor of European security"[32] with the "best-equipped force in Europe"[33] without finally fully recognizing the security dimension of space. Despite some encouraging steps in recent years, Berlin still has a number of challenges to overcome before it can play the ambitious role it aspires to. Thus, the new German federal government will need to position itself as a responsible and capable defense actor—one that actively responds to the evolving security dynamics in outer space and recognizes the critical role of space-based capabilities for security and defense.

Grounds for Optimism?

The 2025 coalition agreement offers promising initiatives to address the strategic dimension of space—militarily, economically, and geopolitically. It outlines plans to expand Germany's national space program, strengthen the European Space Agency (ESA) and increase Germany's contributions, and support the participation of a German astronaut in an international lunar exploration mission. The agreement also envisions Germany's involvement in shaping a successor to the International Space Station, expanding national capabilities in Earth observation and satellite communications, and enhancing the resilience of its space-based infrastructure. Furthermore, it seeks to remove barriers to dual-use research and civil-military cooperation, while putting forth a Space Security Strategy and strengthening Germany's defense posture in space. To

foster innovation and competitiveness, the government plans to strengthen the German *NewSpace* sector—particularly the micro-launcher industry—and support a domestic launch site in the North Sea, as well as enhance the federal government's role as a strategic customer.[34]

Space is further identified as a key technology indispensable for "Europe's effective technological sovereignty"[35]—a designation made just weeks after intense debates in Germany over the continent's significant technological dependence on the United States and American private actors such as Elon Musk, whose Starlink network provides Ukraine with critical capabilities in its war against Russia. These debates were intensified by renewed doubts about U.S. reliability following Donald Trump's return to office and by a growing recognition of the need for Europe to reduce its dependence in the defense technology sector.[36] For this reason, the government aims to "create sovereign capacities for launching satellites into space from Europe" and to advocate for a "more efficient organization of European space activities".[37]

Germany's future role in space, however, will be anchored in its commitment to multilateral cooperation within both the European Union and NATO. This entails balancing deterrence and defense cooperation within NATO and with the United States on the one hand, while also fostering autonomy within the European Union on the other. As Washington will remain the primary provider of space assets for the Alliance in the foreseeable future, Europeans must actively ensure that the U.S. remains engaged in transatlantic security. At the same time, the EU will continue to pursue its ambitions for strategic autonomy[38] and reduced external dependencies, as highlighted by the IRIS² program,[39] which aims to establish an independent satellite-based communications system.

Persistent Challenges

Despite recent steps toward a more comprehensive German approach to space and an apparent heightened awareness of its strategic relevance, as expressed in the new coalition agreement, several challenges persist, and if left unresolved, they risk undermining the nascent momentum.

- *Building 'Space Literacy':* In Germany, overall understanding of the importance of space in society and politics remains limited, with the focus having primarily been on the civil-economic rather than the security dimension of the new space race.[40] As adequate space competence is the foundation of a successful approach to national defense, there must be a stronger engagement with the dependencies, vulnerabilities, and potential security threats, ultimately leading to a clear positioning of Germany's ambitions and interests. In line with Germany's strategic culture, Berlin has thus far been reluctant to take a clear stance in the current geopolitical climate. According to then-Federal Minister of Defense Annegret Kramp-Karrenbauer, German military space operations should remain exclusively defensive in nature[41], and diplomatically,[42] Berlin is committed to upholding norms and principles of responsible behavior to prevent conflict in space. However, this should not prevent an impartial assessment of the—if necessary, offensive—capabilities the Bundeswehr needs to defend itself and fulfill its missions. Nor should it hinder Germany from taking a clear position in this geopolitical space race, alongside like-minded partners such as France, the United Kingdom, and, if possible, the

United States—its most important security allies, who have adopted a more decisive stance on space as both an operational domain and a potential battleground.[43]

- *Integrating Space as a Whole-of-Government Issue:* Rather than continuing to view space as an isolated and secondary issue, its relevance as a cross-cutting issue must be more effectively integrated into broader political and strategic considerations. So far, the familiar problems of German policy are evident here: a less-than-fully functional whole-of-government approach, the lack of interministerial funding mechanisms, and the challenge of aligning the ongoing modernization of space systems with the increasingly rapid innovation cycles, despite lengthy procurement processes.[44] Therefore, there is a need for initiatives that promote stronger institutional coordination between ministries. While a National Space Council modeled after the U.S. system, as advocated by several experts,[45] seems unlikely for now, the new government appears poised to elevate the role of space by establishing a *Federal Ministry of Research, Technology, and Space*—previously housed within the Federal Ministry for Economic Affairs and Climate Action.[46] In combination with the announced creation of a National Security Council within the Federal Chancellery, space security issues could be prioritized, Germany's civil, commercial, and security policies synchronized, and the current fragmentation of responsibilities addressed through clearer processes and the allocation of competencies.[47]
- *Improved Financial Resources and Faster Capability Development:* To strengthen Germany's resilience and operational capacity, financial resources, expertise, and civil-military procurement concepts adapted to technological dynamics are needed for the expansion of capabilities in areas such as SSA to enable Space Domain Awareness, and responsive space.[48] Last years' cuts in the national space program budget for innovation and international cooperation—over 10 percent, from €371 million in 2023 to €333 million in 2024,[49] and a further 12 percent reduction to €291 million in last year's proposal for the 2025 budget[50] (which does not include any space security positions)—coupled with the hitherto generally insufficient defense budget to expand military space capabilities, pose significant challenges to the ambitious plans and send negative signals both domestically and internationally. Despite its often-stated ambition to be a leading (military) space actor, Germany could risk slipping further into the European midfield if this financial decline continues. Thus, the recently adopted financial package, which marks a significant shift in Germany's fiscal policy and exempts defense spending from debt rules when it exceeds one percent of GDP to address gaps in the armed forces, must also be used to expand space-related capabilities.[51]
- *Strengthening Civil-Commercial-Military Cooperation:* The role of Elon Musk's Starlink in supporting both the Ukrainian population and military during the Russian invasion underscores, especially due to the dual-use nature of space technology, the growing importance of commercial actors as central drivers of innovation in both space and defense technology. Strengthening capabilities and enhancing the resilience of critical infrastructure, therefore, requires improved public-private cooperation—one that aligns government objectives with

corporate realities in capability development and procurement processes, fostering essential synergies.[52] Initiatives should include anchor contracts with German suppliers, fewer bureaucratic hurdles and faster procurement processes, higher participation rates for small and medium-sized enterprises, or the long-overdue adoption of a German Space Law to create legal and investment security for both the state and the private sector.[53]

- *Responsible and Conflict-Reducing Use of Space:* As part of an integrated security concept, sustainable, peaceful, and responsible use of space is a key pillar of German policy.[54] From a human perspective, space is a limited resource, one that is endangered primarily by the competition for available orbits and frequencies, but above all by space debris.[55] Germany's policy is based on a clear commitment to international law in space and the promotion of a behavior-based approach to developing international norms in cooperation with like-minded partners. Germany's self-commitment to refrain from destructive ASAT tests, following the Biden administration's initiative, serves as an important diplomatic signal.[56] Given the current insurmountable differences in expanding international space law or creating binding treaties—an issue likely to become even more challenging under the Trump administration—alternative forms of arms control, focusing on transparency and confidence-building measures with like-minded partners, are essential to reducing the potential for conflict and escalation.[57]

Germany stands at a pivotal crossroads in defining its future role in the increasingly contested domain of space.

Against the backdrop of significant challenges to both national and Allied security, Germany stands at a pivotal crossroads in defining its future role in the increasingly contested domain of space. While the new German government appears poised to acknowledge the strategic significance of space, successfully navigating its transformation amid rising geopolitical competition will require sustained political commitment and decisive action in the years to come. Crucially, this will require not only political will and financial ressources but also the strategic vision and capacity to shape and implement a comprehensive space policy across all relevant fields. In an era of rapidly shifting dynamics in space, Germany—and by extension, Europe—can thus no longer afford to remain reactive and neglectful of space security.

The author is the Head of the Foreign and Security Policy Division and the Deputy Director of the Academy for Politics and Current Affairs at the Hanns Seidel Foundation (HSF), a think tank based in Munich. Her research focuses on transatlantic security cooperation, as well as German and European security and defense policy.

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