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Strategic Vulnerabilities in the European Union's Dual-Use Space Architecture

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RESEARCH REPORT

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RESEARCH REPORT

1. Introduction

Space is changing and is witnessing an increasing presence of actors, which, in turn, is driving greater innovation and competition (Secure World Foundation, 2025). Furthermore, the space domain is becoming increasingly militarized (Clapp and Evroux, 2023, p. 1). This growing militarization of space is evident in recent EU initiatives, such as the Space Shield[1] (Parsonson, 2025).

While the European Union started building its space posture in 2007, it remained closely linked to the civilian sector (Deslandes, 2025). Yet, in recent years, the EU has committed to developing a more robust military approach to space to counteract counterspace capabilities intended to obstruct the use of space (Clapp and Evroux, 2023, p. 2). These new "military" efforts, however, are built on prior civilian space capabilities and frameworks, creating a "dual-use" space architecture. This, in turn, could impact the defence re-orientation of the space domain in unforeseen ways (Clapp and Evroux, 2023, p. 4). As the space domain becomes increasingly militarised, the spectrum of space threats is also expanding significantly (European Council, n.d.)[2.] .

The European Union's economic activity, public services and security functions rely heavily on uninterrupted access to space; in this sense, the growing number of space threats expose critical vulnerabilities across civilian, governmental and defence domains, as even limited interference can generate cascading effects, undermining communication, navigation, situational awareness and crisis response capacities (De Luca and Evroux, 2025, p.1; European Council, n.d.).

The dual-use nature of space is not inherently problematic[3] (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, pp. 6-7, 10, 14). Nonetheless, the increasing number of space threats points to the limits of this dual-use approach, specifically that systems designed primarily for civilian governance and commercial continuity are not automatically suited to operate under hostile conditions (Council of the European Union, 2025, p. 6). It is precisely this tension between the benefits and the constraints of dual-use assets that places the EU's space architecture at a crossroads. While these remain valuable in peacetime and for non-hostile security tasks, reliance on civilian-first systems may constrain the European Union's ability to deter, withstand and respond to hostile acts in space (De Luca and Evroux, 2025, pp. 5-6).

Against this background, this research examines whether the EU's civilian-focused and dual-use approach to the space domain creates strategic vulnerabilities to effectively respond, prevent and withstand space threats; furthermore, this study aims to examine how the European Union can overcome the limitations of its dual-use space architecture and transition toward a reliable defence space posture.

[1]The European Space Shield is part of the European Defence Readiness Roadmap 2030 and is aimed at improving the Member States' defence capabilities and to secure the resilience and protection of space assets. It is possible to see this initiative as part of the broader effort to achieve defence readiness by 2030 (Parsonson, 2025).

[2]Space threats can be both non-kinetic actions (such as jamming, spoofing, cyber intrusions and laser dazzling) and kinetic risks (like anti-satellite weapons, co-orbital interference and the deliberate creation of debris through destructive testing) (European Council, n.d.; Clapp and Evroux, 2023, pp. 2-3).

[3]This has allowed the EU to pool resources, reduce costs and maximize civilian spill-overs while gradually integrating security-relevant functions (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, pp. 6-7, 10, 14).

This paper will proceed in structured steps. First, it will examine the shift in the space domain from cooperation to contestation, which, in turn, transformed space into a domain of military competition and altered the strategic environment in which the European Union operates. Second, it analyses the current EU space architecture, focusing on its flagship components and explaining how a civilian foundation evolved into a dual-use framework. Third, this study examines the vulnerabilities arising from this dual-use space approach, focusing on three main constraints that emerge when defence-grade requirements are imposed on systems originally designed for civilian use. Finally, this research offers targeted policy recommendations for effectively overcoming the "dual-use trap," aimed at strengthening the defence dimension of the EU's space posture.

This research expects to find that the constraints on the EU's space architecture do not stem solely from the dual-use nature of EU space systems. This is because the dual-use design does not create fragmentation by itself; however, it amplifies existing constraints by embedding defence functions within governance structures built for civilian and commercial objectives.

2. Space as a Domain of Military Competition

The space domain has become militarily contested and congested, losing the long-standing cooperative element that characterised this environment (NATO, 2025). For example, many of the 10,000 satellites currently in orbit are fundamental to the performance of critical defence and security functions (Euro-Atlantic Security Leadership, 2026, p.1). In particular, critical defence capabilities (such as command and control, intelligence, surveillance, missile warning and secure communications) depend on space-based assets, and interference with them (deliberate or accidental) can increase the risk of instability and magnify vulnerabilities (Euro-Atlantic Security Leadership, 2026, p.1). Arguably, space is no longer a peaceful environment characterized by cooperation. The space domain is now a theatre in which competition, deterrence dynamics and aggressive behaviour increasingly dictate the conditions under which space assets are operated and contested (Euro-Atlantic Security Leadership, 2026, pp.1-2).

This military re-orientation of space can be proved by a combination of factors. First, NATO military doctrine reflects this transformation, recognizing space as a military operational realm alongside the more traditional defence and security domains (NATO, 2025). Space-based capabilities are essential for deterrence and defence, including navigation, missile detection, secure communications and intelligence (NATO, 2025). In this sense, the recognition of space as an operational military domain signals not just a regulatory development, but an acknowledgement that vulnerability in orbit directly affects deterrence credibility and escalation management (NATO, 2025).

Second, the military re-orientation of the space domain is also exemplified by current geopolitical developments. On one hand, the Russian invasion of Ukraine demonstrated the operational centrality of space, where satellite communications, intelligence support and cyber operations against space infrastructure were executed in parallel with on-the-ground military action (Pataki, 2025, p. 1). On the other hand, intensifying rivalry among established and emerging space powers, alongside the expansion of counterspace capabilities, is further eroding the assumption that space can remain insulated from geopolitical confrontation (Pataki, 2025, pp. 1-3).

Finally, this transformation of the space domain is also shown by developments within the European space sector itself. Since 2023, defence and security considerations have increasingly taken precedence over purely civilian uses, reflecting the recognition that space is now a strategic arena exposed to power rivalries and hybrid threats (D'Hoine, 2026). The sector's evolution thus mirrors the broader shift from cooperative access to strategic competition and resilience planning (D'Hoine, 2026).

Collectively, these developments highlight that the space domain has evolved into a congested and competitive military environment. The core issue that this section identifies is not whether space contributes to security, but whether existing governance frameworks are adequate for a domain increasingly characterised by contestation, vulnerability and militarization.

3. Current EU Space Architecture

As mentioned in the introduction, the European Union's space architecture has a long-standing civilian foundation. The foundation of this architecture lies in the EU Space Programme, which is structured around three flagship components: Galileo, Copernicus and IRIS². Together, these components form the functional backbone of the EU's presence in space (European Commission, n.d.c). These programs were originally conceived as civilian infrastructures (Cellerino, 2023, pp. 495-496). For instance, Galileo is the satellite navigation component of the EU's space posture (European Commission, n.d.b). Galileo, the EU's Global Navigation Satellite System (GNSS),was developed as a civilian-focused navigation system. While Galileo is mostly used for navigation, it has numerous applications in agriculture, transport and surveying (European Commission, n.d.b). Copernicus is the EU's Earth observation component of the Space Programme, aimed at monitoring the Earth's environment, delivering data, information and services based on satellite observations (Copernicus, n.d.). Importantly, while Copernicus holds a security application, it is focused on providing decision makers with geo-information on remote areas and border and maritime surveillance (focused on reducing illegal migration and contributing to sea navigation safety), and it does not fully extent to supporting the full-spectrum military intelligence or defence operations (European Association of Remote Sensing Companies, 2023, p. 3). Finally, IRIS² focuses on secure connectivity and communication services. IRIS² aims to address "the EU's long-term security, safety and resilience challenges by offering enhanced connectivity services to governmental users" (European Commission, 2024). While the IRIS² has been described as a step towards safer and more secure governmental communications, it does not constitute a dedicated defence satellite system (European Union Agency for the Space Programme, 2023, pp. 1-2).

Collectively, these components reflect a space architecture in which defence functions are stacked atop systems originally designed for civilian purposes (Cellerino, 2023, p. 496). While this allows for cost-sharing, innovation spill-overs and broad political acceptability, it also embeds defence requirements within infrastructures not initially conceived for hostile environments (Cellerino, 2023, pp. 495-496, 500-501).

Nonetheless, the EU's space domain is going through a transformation in response to the evolving strategic environment (European Commission, 2023). This shift is most visible in the recognition of space as a contested domain in the Strategic Compass and in the adoption of the 2023 Space Strategy for Security and Defence, here referred to as the Strategy (European Commission, n.d.a; Council of the European Union, 2022, pp. 35-36; European Council, n.d.). The Strategy is the EU's first attempt to address space from a defence and security perspective. Its central objectives are to enhance the resilience and protection of EU space systems, improve collective awareness of space threats, strengthen the EU's ability to respond to hostile acts in space and promote closer coordination between civilian, security and defence actors (European Council, n.d.). Furthermore, while the Strategy does not introduce a comprehensive military space architecture, it advances a new organizational concept: Space Domain Awareness (SDA) (Fiott, 2023, p. 1). Unlike earlier notions such as Space Surveillance and Tracking (SST)[4] or Space Situational Awareness (SSA)[5], SDA integrates traditional detection and tracking features with analysis of object intent and strategic threats, making it a concept explicitly used to assess and respond to potentially hostile activities in space (Katalyst, n.d.). However, while the SDA marks a departure from previous EU approaches to space and signals a broader militarization of the domain, the Strategy advances a defence-oriented logic not by creating new military systems but by reinterpreting existing space assets through a security lens (Fiott, 2023, p. 3).

Furthermore, in June 2025, the Commission proposed the EU Space Act, which introduces harmonised EU-level requirements on safety, resilience and sustainability for space activities (European Commission, 2025a). Yet, the Act does not create new military capabilities; rather, it standardizes authorisation procedures, cybersecurity risk-management and debris-mitigation requirements across Member States (European Commission, 2025b, pp. 3-4, 16-17, 23). In doing so, the Act aims to reduce fragmentation generated by divergent national frameworks and to ensure a common baseline of protection for space infrastructure operating within the internal market (European Commission, 2025b, pp. 2-3, 16). However, the Space Act is explicitly framed as an internal market harmonisation measure under Article 114 TFEU and excludes assets used exclusively for defence or national security purposes (European Commission, 2025b, pp. 4, 19–20).

Consequently, while the EU Space Act strengthens regulatory coherence and resilience standards, it does not establish a dedicated defence command layer, thereby reinforcing the dual-use nature of the EU's space architecture rather than transforming it. Thus, it is possible to argue that while the Strategy elevates the EU's strategic ambition in space, it does not resolve the pre-existing constraints embedded in its architecture.

As such, while the EU's space approach was initially civilian-focused, the bloc's efforts are increasingly defence-oriented as a response to a more contested, congested and militarized space domain.

[4]"Space Surveillance and Tracking (SST) system detects space debris, catalogues debris objects, and determines and predicts their orbits" (European Space Agency, n.d.)

[5]Space Situational Awareness (SSA) refers to the understanding of the space environment achieved by detecting and tracking objects orbiting Earth (like satellites and debris) so that their positions, movements, and physical characteristics are known. It aims to catalogue objects and their trajectories to support collision avoidance and general space traffic management, without necessarily addressing defence-related elements (Katalyst, n.d.)

However, these efforts are currently built on civilian and dual-use infrastructure that was not originally designed to meet defence-grade requirements, creating a structural tension between emerging defence objectives and space governance choices optimized for non-hostile environments.

4. Structural Vulnerabilities in the EU's Dual-Use Space System

From the prior section, it becomes clear that the EU's space architecture has been deliberately built with a strong civilian focus, with defence applications layered on systems originally designed for other non-security purposes (Advisory Council on International Affairs, 2025, p. 6). While the EU's space architecture is currently framed as dual-use, the civilian-first logic that shaped their initial trajectory creates capabilities gaps that become particularly visible once defence-grade requirements are imposed (Advisory Council on International Affairs, 2025, p. 7).

Indeed, the EU's reliance on dual-use and civilian-first space architecture allows it to cut costs, foster technological innovation, and improve integration between civilian and defence domains (Advisory Council on International Affairs, 2025, p. 7). Yet, this approach risks lowering deterrence and resilience, as well as creating fragmentation and slower decision-making (Fiott, 2023, p. 1; Euro-Atlantic Security Leadership Group, 2026, p.1; Salmeri and Carlo, 2021, p. 112). This creates what can be described as a dual-use trap: systems that are technically usable for defence, but institutionally constrained from being optimised for it. Furthermore, this trap lies in the governance, funding logic and legal frameworks that underpin EU space programmes, which were designed to prioritise openness, civilian continuity and commercial integration rather than rapid military tasking and escalation management. As a result, defence functions remain layered onto infrastructures that were not conceived for high-intensity or adversarial environments, limiting their adaptability under crisis conditions (Langeland et al., 2026, pp. 1-2; Mezzadri, 2026, p. 4). These constraints are not abstract features; they translate into concrete strategic vulnerabilities. In particular, the EU's dual-use architecture generates three limitations that directly affect deterrence credibility, resilience and crisis responsiveness.

First, the EU's dual-use space architecture leads to deterrence ambiguity (Slapakova et al., 2021, p. 186). Because it is incredibly challenging to determine whether a space asset has civilian or military applications, adversaries may struggle to discern intent, raising the risk of misperception and escalation (McClintock et al., 2026, pp. 1–3). In other words, the inability to clearly differentiate between peaceful and military functions creates uncertainty regarding proportional responses and legitimate targeting under international law (McClintock et al., 2026, pp. 1-3). Furthermore, EU Member States appear to have different approaches to the use of dual-use assets in space, which, in turn, creates legal and operational inconsistencies and uneven escalation thresholds (Lebret et al., 2026, pp. 40-47; Cséfalvayová, n.d.).

In this sense and in an increasingly hostile space environment, this high level of ambiguity lowers the European Union's overall deterrence, as adversaries could perceive the EU's response to space threats or attacks as politically constrained or insufficient for conflict scenarios (Slapakova et al., 2021, pp. 186-187). Ambiguity in itself does not automatically weaken deterrence, as in certain contexts it may even increase caution among adversaries; yet, because Member States retain different interpretations of how dual-use assets may be employed or protected in conflict scenarios, signalling coherence becomes difficult (Youvan, 2024, p. 2). This weakens deterrence credibility, as adversaries may perceive EU responses to hostile acts in space as politically constrained, delayed, or limited in scope (Salmeri and Carlo, 2021, p. 112). Thus, assets that are operationally crucial for defence remain embedded in a civilian framework, complicating coherent and credible deterrence signalling. Nonetheless, the deterrence deficit does not stem solely from dual-use ambiguity, but from the absence of a unified defence command structure capable of translating space capabilities into reliable military signals (Mezzadri, 2026, p. 3).

Second, with its current space approach, the EU faces a resilience deficit (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2023, pp. 5-7). The European Union heavily depends on non-EU military space (Advisory Council on International Affairs, 2025, p. 11). In particular, Member States' military space capabilities were developed on the basis of US space assets and intelligence, enabling the EU to develop faster, more effective and more precise ISR support and precision-enabled operations (Advisory Council on International Affairs, 2025, p. 23). This dependence is rooted in the original civilian EU space posture. Because flagship programmes such as Galileo and Copernicus were not designed as military systems from the outset, they lack certain defence-grade features such as protected bandwidth allocation, secure military-exclusive redundancy layers and rapid operational tasking mechanisms (De Man and Wouters, 2025, p. 2). Consequently, Member States continue to rely on U.S. military space infrastructure for critical capabilities, particularly in ISR and secure communications. Here, it is important to note that the EU's reliance on U.S. military space capabilities is not only the result of its civilian-first architecture; rather, it is rooted in decades of NATO-based burden-sharing (Süß, 2026, pp. 3-7). However, the second Trump administration and the deterioration of the Transatlantic Alliance risk limiting the long-standing access to US space systems (Advisory Council on International Affairs, 2025, p. 23). While this in itself is a substantive barrier to the EU's resilience, it is even more so when it comes to capabilities critical to armed forces, such as ISR, as this creates strategic dependency in high-intensity scenarios and limits autonomous operational planning (Advisory Council on International Affairs, 2025, p. 24).

Third, the EU's current dual-use architecture generates governance latency (Corsano, 2023, p. 1). Decision-making authority over EU space assets remains dispersed across civilian and EU agencies, Member States and voluntary coordination frameworks (Corsano, 2023, p. 1). In crisis scenarios requiring rapid military responses, this institutional fragmentation may delay threat attribution, tasking decisions and coordinated countermeasures.

The absence of a unified military command layer over EU space systems, therefore, constrains operational responsiveness under adversarial conditions (Advisory Council on International Affairs, 2025, pp. 45-46). While governance fragmentation is not unique to EU space policy, the characteristics of the space domain magnify its consequences. Unlike other policy domains, space operations occur under compressed operational timelines, and hostile interference can generate cascading effects within minutes (Mezzadri, 2026, pp. 1-2). In this sense, embedding space capabilities within civilian governance structures that prioritise consensus-building and continuity over rapid military responsiveness creates a structural mismatch between institutional design and operational necessity (Mezzardi, 2026, pp. 1, 12-13).

The strategic consequences of the EU's dual-use and civilian-first space posture demonstrate that the core issue is not the existence of dual-use systems per se, but the structural limitations embedded within their governance and design logic (Advisory Council on International Affairs, 2025, pp. 45-46, 49). The reliance on civilian-founded infrastructures constrains deterrence, reduces resilience under deliberate interference and introduces governance latency in crisis response (Hunter, 2025, pp. 15, 18-19). In this sense, the EU's dependence on a dual-use architecture structurally limits its ability to operate as a coherent and autonomous defence actor in an increasingly contested space domain (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2023, p. 11). Without targeted reforms that address these embedded constraints, the EU risks remaining technologically advanced yet strategically constrained (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2023, p. 1)

5. Policy Recommendations

This research has demonstrated that the European Union's dual-use space architecture generates barriers that limit deterrence, resilience and institutional responsiveness. In this sense, the issue is not whether the EU has capable space systems but whether they are aligned with the demands of an increasingly contested and militarised domain (Fiott, 2023, pp. 1-2; Hunter, 2025, pp. 15, 18-19; Advisory Council on International Affairs, 2025, pp. 6-7, 45-46). If the European Union seeks to operate as a coherent and autonomous defence actor in space, it is fundamental to establish targeted reforms to move beyond the dual-use trap and embed defence-grade functionality within the EU's space posture. Based on the gaps and vulnerabilities identified in this paper, the following recommendations outline concrete steps to address these constraints.

1.) **Establish clear crisis rules for the military use of space systems:** the European Union should create a framework that defines how civilian flagship space programs (such as Galileo, Copernicus and IRIS^2) should be used for defence objectives or during military escalations. Clear rules would make EU responses more predictable and credible. To achieve this, the rules should define how space assets are protected in conflict situations and align Member States on when or how dual-use systems may support military operations. By doing so, this framework would be fundamental to improving deterrence (The White House, 2019).

2.)**Create a secure military layer within existing space systems**: the EU should build a protected military layer within existing space programs. This should include secure military communication channels, backup systems that work even if civilian systems are attacked, and stronger cyber protections designed specifically for defence use. This would be key to increasing EU resilience (United States Space Forces, 2025).
3.) **Design a permanent EU space security coordination unit:** Following what has been done in the cybersecurity domain with ENISA, the EU should establish a permanent space security coordination unit to unify space governance and improve decision-making speed, operational effectiveness and clarity. This unit would monitor space threats in real time, coordinate responses between the EU and Member States and organise joint exercises on space security (ENISA, n.d.).

6. Conclusion

This research aimed to examine whether the EU's dual-use space approach constrains its defence capabilities. The analysis highlighted that, while the current dual-use architecture that characterizes the EU's approach to space is effective for civilian and commercial purposes (European Commission, 2025b, pp. 6-7, 10, 14; Cellerino, 2023, pp. 495-496), this approach generates three main constraints that are particularly evident when defence-grade requirements are imposed (Advisory Council on International Affairs, 2025, p. 7; Langeland et al., 2026, pp. 1-2); this, in turn, creates what this paper has labelled as a "dual-use trap." Specifically, this trap manifests itself through deterrence ambiguity, a resilience deficit and governance latency (Slapakova et al., 2021, pp. 186-187; European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2023, pp. 5-7; Corsano, 2023, p. 1). In particular, civilian framing weakens credible deterrence, dependence on non-EU military space undermines resilience and strategic autonomy, and fragmented governance structures slow crisis responsiveness (Salmeri and Carlo, 2021, p. 112; Advisory Council on International Affairs, 2025, pp. 23-24; Advisory Council on International Affairs, 2025, pp. 45-46; Corsano, 2023, p. 1). Together, these constraints limit the EU's ability to operate as a meaningful and effective defence actor in an increasingly adversarial space domain.

The EU's dual-use space architecture introduces structural vulnerabilities that constrain deterrence, resilience and responsiveness. However, these constraints are not irreversible. Targeted reforms (such as clear crisis-use frameworks, a protected military layer within existing systems and a permanent space security coordination unit) can embed defence-grade functionality within the current architecture (ENISA, n.d.; U.S. Space Forces, 2025; The White House, 2019). The EU's space approach can remain technologically sophisticated yet strategically constrained, or it can deliberately evolve beyond the dual-use trap toward a credible defence-capable space framework.

Bibliography

Advisory Council on International Affairs. (2025). Governing Space Safety and Security. In Advisory Council on International Affairs.

Cellerino, C. (2023). EU Space Policy and Strategic Autonomy: Tackling Legal Complexities in the Enhancement of the 'Security and Defence Dimension of the Union in Space.' In European Papers. https://doi.org/10.15166/2499-8249/669.

Clapp, S., & Evroux, C. (2023). EU Space Strategy for Security and Defence. In EPRS - European Parliamentary Research Service.

Copernicus. (n.d.). About Copernicus. https://www.copernicus.eu/en/about-copernicus.

Corsano, A. (2023). The Issue of Fragmentation in EU Space Governance. In Finabel.

Council of the European Union. (2022). A strategic compass for security and defence: For a European Union that protects its citizens, values and interests and contributes to international peace and security. Publications Office of the European Union.

Council of the European Union. (2025). Space: the New Battleground of Modern Warfare. In Council of the European Union.

Cséfalvayová, K. (n.d.). The Dual-Use Dilemma: Why Europe Must Rethink Civil-Military Innovation. Institute for Central Europe. https://iceoz.eu/the-dual-use-dilemma-why-europe-must-rethink-civil-military-innovation/.

De Luca, S., & Evroux, C. (2025). Satellites: State of Play and Challenges for the EU. In European Parliamentary Research Service - EPRS. https://www.europarl.europa.eu/RegData/etudes/BRIE/2025/777930/EPRS_BRI(2025)777930_EN.pdf.

De Man, P., & Wouters, J. (2025). EU space governance at the threshold of a new era. Global Policy. https://doi.org/10.1111/1758-5899.70030.

Deslandes, L. (2025). The European Union in Space: From exploration and innovation to security and autonomy. European Student Think Tank. https://esthinktank.com/2025/06/19/the-european-union-in-space-from-exploration-and-innovation-to-security-and-autonomy.

D'Hoine, S. (2026). Europe's Space Sector at a Strategic Crossroads. SopraSteria. https://www.soprasteria.com/insights/details/europe-s-space-sector-at-a-strategic-crossroads.

Euro-Atlantic Security Leadership Group. (2026, February). Statement by the Euro-Atlantic Security Leadership Group (EASLG).

European Association of Remote Sensing Companies. (2023). Industry views on the EU Space Strategy for Security and Defence - Position paper from the European Earth Observation Downstream services industry (No. 20230401).

European Commission. (2023). A EU Space Strategy for Security and Defence for a stronger and more resilient EU. European Commission - Defence Industry and Space. https://defence-industry-space.ec.europa.eu/eu-space-strategy-security-and-defence-stronger-and-more-resilient-eu-2023-03-10_en.

European Commission. (n.d.a). EU Space Strategy for Security and Defence. European Commission - Defence Industry and Space. https://defence-industry-space.ec.europa.eu/eu-space/eu-space-strategy-security-and-defence_en.

European Commission. (n.d.b). Galileo | Satellite Navigation. European Commission - Defence Industry and Space. https://defence-industry-space.ec.europa.eu/eu-space/galileo-satellite-navigation_en.

European Commission. (2025a). EU Space Act. European Commission - Defence Industry and Space. https://defence-industry-space.ec.europa.eu/eu-space-act_en.

European Commission & High Representative of the Union for Foreign Affairs and Security Policy. (2023). European Union Space Strategy for Security and Defence.

European Commission. (2024). IRIS2: the new EU Secure Satellite Constellation. European Commission - Defence Industry and Space. https://defence-industry-space.ec.europa.eu/eu-space/iris2-secure-connectivity_en.

European Commission. (2025b). Proposal for a Regulation of the European Parliament and of the Council on the Safety, Resilience and Sustainability of Space Activities in the Union.

European Commission. (n.d.c). The European Union in Space. European Commission - Defence Industry and Space. https://defence-industry-space.ec.europa.eu/eu-space_en.

European Council. (n.d.). Space, Security and Defence. https://www.consilium.europa.eu/en/policies/space-security-and-defence.

European External Action Services. (2026). Space. European Union External Action. https://www.eeas.europa.eu/eeas/space_en.

European Space Agency. (n.d.). Space Surveillance and Tracking - SST Segment. European Space Agency - Space Safety. https://www.esa.int/Space_Safety/Space_Surveillance_and_Tracking_-_SST_Segment.

European Union Agency for the Space Programme. (2023). IRIS2 Factsheet. In European Union Agency for the Space Programme. https://www.euspa.europa.eu/publications-multimedia/resources/iris2-factsheet.

Hunter, A. (2025). Dual-Use Innovation: Confronting the Challenges and Delivering EU Security and Competitiveness. European Policy Centre, 1–23. https://d1xp398qalq39s.cloudfront.net/uploads/ckeditor/2025/11/18/dual-use-dp-v2.pdf.

Kytalyst. (n.d.). Space Domain Awareness (SDA). https://www.katalystspace.com/space-domain-awareness.
Langeland, K., et al. (2026). Exploring Duality in Space: How Select Countries Approach Dual-Use Space Systems. RAND Corporation. https://www.rand.org/t/RRA4003-2.

Lebret, M., et al. (2025). Duality in Space Volume II, Europe-Eurasia Workshop Insights on Developing, Deploying, and Governing Dual-Use Space Systems. In RAND Corporation. https://www.rand.org/content/dam/rand/pubs/conf_proceedings/CFA4000/CFA4003-2/RAND_CFA4003-2.pdf.

McClintock, B., et al. (2026). Introduction. In Exploring the Duality in Space (pp. 1–12). RAND.

Mezzadri, S. (2026). Building a European Geospatial Intelligence Capability: Mapping Initiatives, Identifying Gaps, and Outlining Strategic Options. In The Armament Industry European Research Group (Ares Group). https://www.iris-france.org/wp-content/uploads/2026/01/ARES_2026_01_122_European_Spatial_Intelligence_PolicyPaper.pdf.

NATO. (2025). NATO's Approach to Space. https://www.nato.int/en/what-we-do/deterrence-and-defence/natos-approach-to-space.

Parsonson, A. (2025, October 21). EU to Roll Out European Space Shield Initiative in 2026. European Spaceflight. https://europeanspaceflight.com/eu-to-roll-out-european-space-shield-initiative-in-2026/.

Pataki, Z. G. (2025). [EU capabilities in space: Scenarios for space security by 2050]. In EPRS - European Parliamentary Research Service (Report PE 765.792; pp. 1–24). https://doi.org/10.2861/8152081.

Salmeri, A., & Carlo, A. (2021). Security-by-Design Approaches for Critical Infrastructure: Mapping the landscape of Cyber and Space Law. In Legal Aspects of Space: NATO Perspectives (42nd ed., pp. 97–113).

Slapakova, L. (2021). Strategic and Legal Implications of Emerging Dual-Use ASAT Systems. In Legal Aspects of Space: NATO Perspectives (42nd ed., pp. 178–193).

Secure World Foundation: 2025 Global Counterspace Capabilities Report. (2025). https://www.swfound.org/publications-and-reports/2025-global-counterspace-capabilities-report.

Süß, J. (2025). European Autonomy in Space. In German Institute for International and Security Affairs. https://www.swp-berlin.org/publications/products/comments/2026C02_EuropeanAutonomy_in_Space_Web.pdf.

The White House. (2019). Text of Space Policy Directive-4: Establishment of the United States Space Force. https://trumpwhitehouse.archives.gov/presidential-actions/text-space-policy-directive-4-establishment-united-states-space-force/.

United States Air Forces. (2025). Modernized GPS operating system closer to operational integration. https://www.spaceforce.mil/News/Article-Display/Article/4242898/modernized-gps-operating-system-closer-to-operational-integration/.

Youvan, D. C. (2024). Amimut (Ambiguity): The Strategic Use of Uncertainty in Diplomacy and International Relations.

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