EU Non-Proliferation and Disarmament Consortium

Promoting the European network of independent non-proliferation and disarmament think tanks

NON-PROLIFERATION AND DISARMAMENT PAPERS

No. 83 June 2023

THE EU SPACE STRATEGY FOR SECURITY AND DEFENCE: TOWARDS STRATEGIC AUTONOMY?

RAÚL GONZÁLEZ MUÑOZ AND CLARA PORTELA

I. INTRODUCTION

The European Commission and the High Representative (HR) for Foreign Affairs and Security policy, Josep Borrell, launched the European Union Space Strategy for Security and Defence (EU Space Strategy) on 10 March 2023.[1] The EU Space Strategy is the most recent in a growing sequence of policy initiatives in the security field adopted by the European Union. The 2003 European Security Strategy, published under the leadership of then-High Representative for the Common Foreign and Security Policy (CFSP), Javier Solana, was the first time that the EU identified the perceived threats to its security in a single document and outlined how it intended to use the tools at its disposal to respond to them.[2] The European Security Strategy was adopted jointly with the EU Strategy against the Proliferation of Weapons of Mass Destruction, which was intended to highlight a European commitment to addressing these threats following disagreements over the 2003 US-led invasion of Iraq.[3] A second wave of strategic documents came more than a decade later, when a Global Strategy was devised. In addition to expanding its scope from security to foreign policy more generally, the Global Strategy was formulated in an inclusive process that also involved civil society actors. However, it was produced under the leadership of the then-High Representative for Foreign Affairs and Security Policy,

[1] European Commission, Directorate-General for Defence Industry and Space, Joint Communication to the European Parliament and the Council, 'European Union Space Strategy for Security and Defence', JOIN(2023)9, 10 Mar 2023.

[2] Council of the European Union, *European Security Strategy: A Secure Europe in a Better World* (Brussels, 2009), pp. 27–43.

[3] Council of the European Union, 'EU Strategy against Proliferation of Weapons of Mass Destruction', 15708/03, Brussels, 10 Dec. 2003; and Onderco, M. and Portela, C., 'NATO's Nordic enlargement and nuclear disarmament', War on the Rocks, 20 Feb. 2023.

SUMMARY

Satellite navigation, communications and imagery are critical to military doctrine. They provide the capability and functionalities required to operate increasingly complex military assets with unprecedented precision. On account of their growing importance, there is a need for EU member states to develop their own satellite infrastructure, and to ensure control over and superiority in the space landscape in which satellites operate in order to protect their security. This paper analyses the EU Space Strategy, which is the first of its kind, identifying its strengths and areas where there is room for improvement, as well as the challenges facing the project to establish a common European space defence policy, in terms of both institutional and industrial collaboration.

ABOUT THE AUTHORS

Dr Raúl González Muñoz has a PhD in Aerospace Manufacturing from Cranfield University, conducted in close collaboration with Airbus Operations UK. After working for a year in Airbus Toulouse, he studied at Sciences Po University in Paris and joined the Space Task Force at the European External Action Service in Brussels. Currently, he is leading a research project in Capgemini Engineering and is a Board Member of the Spanish Association for Aeronautical and Space Law (AEDAE).

Dr Clara Portela teaches Political Science at the Law School of the University of Valencia, having previously served at Singapore Management University and the European Union Institute for Security Studies (EUISS) in Paris. Her research focuses on arms control, European security and EU foreign policy. She has a PhD from the European University Institute in Florence. Clara Portela was the inaugural Konrad Adenauer Visiting Scholar at the Centre for European Studies, Carleton University in Ottawa, Canada.

Federica Mogherini, and its launch did not involve the endorsement of EU member states.[4] Most recently, the EU published its 'Strategic Compass' in 2022, which follows in the footsteps of the European Security Strategy.[5] Acknowledging the 'need to be prepared for a more competitive and contested space environment', the Strategic Compass heralded the launch of an EU Space Strategy to build a common understanding of space-related risks and threats, and to develop appropriate responses and capabilities to react, and strengthen resilience.[6]

While some previous strategies set out a comprehensive approach to enhancing the security of the EU, others can be categorized as thematic through their focus on a specific domain. The EU Space Strategy falls into the latter category. Nonetheless, it shares with earlier documents a lack of operationalization of the identified challenges and required responses. Despite their comparative vagueness, however, EU strategy documents signal a common analysis of the security environment, a consensus on how to address security threats, and a readiness to deploy a variety of tools in a coordinated fashion. Importantly, while the 2003 European Security Strategy was a text prepared by Solana and endorsed by the European Council, the Strategic Compass relies on the first threat assessment exercise conducted by the EU, which involved member states directly.[7] In this context, the EU Space Strategy signifies a commitment to follow-up an initiative heralded by the Strategic Compass.

An important aspect in the evolution of EU strategic documents in the security domain is the development of the notion of European strategic autonomy. The term first surfaced in an official EU document in December 2013, in European Council Conclusions that discussed the European defence industrial base.[8] Its use became more frequent after featuring in the Global Strategy, expanding from its initial defence application to policy fields such as trade, the economy, digitalization and technology. It has been promoted under the current European Commission led by Ursula von der Leyen.[9] Emerging from the first joint EU threat analysis exercise, the Strategic Compass spells out the goal of establishing European strategic autonomy and importantly also mentions outer space policy, which had been absent from any of the previous strategies.

How does the EU Space Strategy aim to advance Brussels' declared ambition to achieve strategic autonomy? First, it aims to facilitate a transition from a civilian-oriented space policy to one with certain military applications—thereby explicitly acknowledging the 'dual-use character' of space assets. Second, by establishing a baseline of action on protecting the EU's space assets, as well as coordination with national space defence strategies, it aims to foster progressive convergence towards a unified Space Strategy for all member states. For the time being, the EU can take steps to ensure that member states coordinate their policies at the European level through article 189 of the 2007 Treaty on the Functioning of the European Union (TFEU), which stipulates that the EU draw up a European space policy 'to promote scientific and technical progress, industrial competitiveness and the implementation of its policies', and 'may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of space'. However, there are significant constraints on the framing and implementation of space policy on account of the current division of competences between the EU and individual member states. Ultimately, the above-mentioned goals imply the transfer to the EU of competences that remain in the hands of member states.[10] While article 189 TFEU excludes any harmonization of the laws and regulations of member states, article 4.3 TFEU stipulates that the EU's competence shall not result in member states 'being prevented from exercising theirs'. The EU space strategy cannot, by itself, modify the legal situation, but it can highlight the potential and pave the way for EU strategic autonomy in space.

Furthermore, with respect to agreements and partnerships on space security, the EU's approach to space defence is framed against the background of its com-

[4] Sanahuja, J. A., 'The EU Global Strategy: Security narratives, legitimacy, and identity of an actor in crisis', eds E. Conde, Z. Yaneva and M. Scopelliti, *Routledge Handbook on European Security Law and Policy* (Routledge: Abingdon, Oxon, 2020), pp. 395–414.

[5] European External Action Service, 'A strategic compass for security and defence', Brussels, 21 Mar. 2022.

[6] European External Action Service (note 5), p. 36.

[7] European External Action Service (note 5).

[8] European Council Conclusions, EUCO 217/13, Brussels, 20 Dec. 2013.

[9] Burni, A. et al., 'Progressive pathways to European Strategic Autonomy: How can the EU become more independent in an increasingly challenging world?', Foundation for European Progressive Studies, Policy Brief (Mar. 2023).

[10] Pedrazzi, M., 'EU space security policy', eds E. Conde, Z. Yaneva and M. Scopelliti, *Routledge Handbook on European Security Law and Policy* (Routledge: Abingdon, Oxon, 2020) pp. 213–19.

mitment to the international norms enshrined in article 2 of the 1992 Treaty on European Union (TEU).[11] As a champion of international law, the EU supports the peaceful use of space, adherence to international space law and the prevention of an arms race in outer space.[12] However, it must also protect its outer space assets. Section II details the significance of space defence in contemporary international relations. Section III outlines the space assets currently in position or being developed by EU member states. Section IV identifies and discusses the objectives of the EU Space Strategy. Section V makes policy recommendations that address the strategy's identified limitations and problems. Section VI discusses some conclusions.

II. THE IMPORTANCE OF A SPACE DEFENCE POLICY

In the contemporary era, outer space has emerged as a critical domain for modern militaries and strategic operations. The increasing reliance of today's armed forces on space-based assets for surveillance, intelligence gathering, positioning and communications makes them vulnerable to any disruption to the services these assets provide.[13] The frequent lack of any redundancy strategy for some of these systems accentuates the impact of any possible service interruption, which would hugely restrict the situational awareness of a modern army and its capacity for deployment and action.[14] This underscores the pressing need for a comprehensive space strategy for security and defence to safeguard these assets and ensure their continued operation.[15] The importance of space in modern defence strategies cannot be overstated. Space-based assets provide a wide range of essential capabilities that are integral to the functioning of modern armed forces.

Many of these assets have a dual-use character. They are actively employed for civilian and scientific matters and contribute considerably to modern economies across the world. With regard to their military applications, satellite-based communication (SATCOM) networks enable real-time communication and information sharing among military units, allowing for coordinated operations in remote areas and enhancing situational awareness. Satellite-based navigation systems, such as the Global Positioning System (GPS), provide positioning, navigation and timing (PNT) data that are crucial for precision targeting, missile defence and troop movement. Space-based intelligence, surveillance and reconnaissance (ISR) capabilities allow for early warning of potential threats, monitoring of the activities of adversaries and the collection of intelligence for decision making.

The significance of outer space for defence and security is further amplified by the evolving security challenges of the 21st century. The global security landscape reflects increased geopolitical tensions, growing competition for resources and the proliferation of advanced technologies. Far from remaining immune to these developments, outer space has experienced further militarization and weaponization in recent years, involving a remarkable rise in the number of dual-use space assets and a growing diversity of actors engaged in space activities.[16] While space has always been militarized, in that it has always had a military component to its development and possible application, it has been increasingly weaponized since the 2000s, understood as the placement in orbit of space-based devices with destructive capacity.[17] Several major powers, such as China, India, Russia and the United States, have actively pursued the development of space technologies for offensive and defensive purposes in recent decades, with some EU member states, notably France, Germany, Italy and Spain, also developing some defensive capabilities.[18] Furthermore, some of these nations, most recently Russia in 2021, have conducted a number of anti-satellite (ASAT) tests in the past

[11] 'The Union is founded on the values of respect for human dignity, freedom, democracy, equality, the rule of law and respect for human rights', article 2, Treaty on European Union.

[12] United Nations Treaties, 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

[13] Chapman, B., *Space Warfare and Defense: A Historical Encyclopaedia and Research Guide* (ABC-CLIO: Santa Barbara, CA, 2008).

[14] Evans, G., 'The problem with GPS in the modern military', *Global Defence Technology*, 11 June 2018; and Air Force Space Command, 'Resiliency and disaggregated space architectures', White Paper, 24 Apr. 2013.

[15] Steinberg, A., 'Weapons in space: The need to protect space assets', *Astropolitics*, vol. 10, no.3 (2012), pp. 248–67.

[16] Anson, P. and Cummings, D., 'The first space war: The contribution of satellites to the gulf war', *RUSI Journal*, vol. 136, no. 4 (1991), pp. 45–53.

[17] Mowthorpe, M., *The Militarization and Weaponization of Space* (Lexington Books, 2004).

[18] Schrogl, K. U. et al. (eds), *Handbook of Space Security* (Springer, 2020).

decade, which has contributed to the weaponization of space while also generating hazardous space debris—artificial material that orbits the Earth but is no longer functional. The aim of such ASAT tests is to develop and demonstrate the capability to destroy or disable satellites in orbit, and to showcase to possible adversaries the possession of such a capability. There are various means of interfering with, disabling or destroying space systems, from direct-ascent missiles to co-orbital interceptors, energy weapons or cyberattacks.[19]

Europe is directly affected by these developments. European space capabilities are developed through a variety of means, both direct investments by member states and through bilateral and multilateral collaborations. One example of this is the Athena-Fidus project, which was jointly developed by France and Italy. The EU is also involved in funding space initiatives, such as efforts by the European Defence Agency (EDA) to build-up its capacity in space. In addition, the EU Space Programme, which has both civil and commercial components, provides funding for space-related activities. Several EU member states, notably France, Germany and Italy, have made substantial investments in space-based assets and have a long space history since their first satellite launches in the 1960s. They played a pivotal role in the creation of the European Space Agency (ESA) in the 1970s and have a set of ongoing national, collaborative and bilateral space programmes. The current state of European space capabilities varies across the region. France has long been at the forefront of the development of space capabilities, boasting significant assets in areas such as satellite communications, Earth observation (EO) and military surveillance.[20] Germany has also made substantial strides in the development of space assets, particularly in the domains of EO and communications.[21] Italy has focused on EO and communications capabilities in close collaborations with France, while Spain has also invested in military surveillance and communications. The creation of the EU Space Surveillance and Tracking (SST) consortium in 2015, based on the core SST capabilities of France, Germany, Italy and Spain, but now with the involvement of 15 member states, has enabled the EU to develop Space Domain Awareness (SDA) capabilities.

However, the space assets of EU member states, some of which are not even located on EU territory, remain vulnerable to potential threats, be they intentional such as from ASAT weapons or unintentional from space debris. Against a backdrop of developments in EU space capabilities, the notion of a common approach to enabling the EU to enhance the protection of its space-based assets has been gaining momentum in recent years, leading to the March 2023 EU Space Strategy. The EU recognizes the need for a comprehensive space defence strategy to safeguard its space-based assets and securely enhance its space capabilities. The EU's space strategy is part of its broader security and defence agenda, which aims to ensure the protection of EU interests, safeguard its territory and population, and promote peace and stability, in line with the goals set out in its 2022 Strategic Compass.[22] The EU acknowledges the critical role that space plays in the domains of security, defence and meeting societal needs, and argues that space is host to economic and security infrastructure that is indispensable to its capability to address global challenges.

The EU has also recognized that space-based services are increasingly crucial for military operations and essential infrastructure, which increases the security and defence implications of space activities. The EU's approach to space is situated in the context of its broader foreign and security policy. A primary objective of this policy is to ensure that the EU can reap the benefits of space while minimizing the risks and vulnerabilities associated with its use. To ensure the protection of EU interests and promote peace and stability, the EU emphasizes the significance of international cooperation and the development of norms of behaviour in space. It also underscores the importance of enhancing its autonomy and resilience by developing its space capabilities. The EU's approach to space is grounded in the principles of transparency, confidence-building and peaceful cooperation. While it aims to avoid an arms race in space, the EU's space strategy is anchored in an understanding that space is a crucial domain for security and defence, and its

[19] Weeden, B. and Samson, V., 'Global counterspace capabilities: An open source assessment', Secure World Foundation, Apr. 2020; and Raju, N., 'A proposal for a ban on destructive anti-satellite testing: A role for the European Union?', *Non-Proliferation and Disarmament Papers* no. 74 (Apr. 2021).

[20] Schrogl et al. (note 18), p. 457; and Delaporte, M., 'ASTERX 2021: French Space Forces Reach for Higher "Orbit"', Breaking Defense, 9 Apr. 2021.

[21] TanDEM, Science service system, 'Home'; Satellite-based Radar Reconnaissance System (SaRAH), 20 June 2022; and Airbus, 'SatcomBw', [n.d.].

[22] European External Action Service (note 5).

protection remains essential to the maintenance of EU strategic autonomy, resilience and capability to act.[23]

The development of an EU space strategy has been guided by various strategic and geopolitical factors. First, the changing global security landscape and the increasing weaponization of space have prompted the EU to prioritize the protection of its space-based assets, in close cooperation with the US and other allies and international organizations such as the North Atlantic Treaty Organization (NATO).[24] The EU recognizes the vulnerability of its space-based assets to intentional attacks, unintentional disruptions and space debris, which could significantly impact its defence and security capabilities as well as those of its member states.[25] A proactive and coordinated space strategy is seen as essential to mitigating these risks. Second, the growing competition for space-enabled capabilities and services has driven the EU's focus on space defence. There is considerable transatlantic cooperation in this area, thanks to a long-standing partnership in the field of space which has been strengthened over the years by a series of agreements and collaborations. One framework for this cooperation is NATO policy. NATO's policy on space is outlined in several documents, such as the 2019 NATO London Summit Declaration and the 2019 Space Policy.[26] These documents highlight how space has become a contested domain, as nations vie for access to space-based resources such as satellite communication frequencies, navigation services and remote sensing data. As a major actor with space assets of its own, the EU is seeking to safeguard its access to these resources and protect its space-based capabilities from potential disruption or denial by adversaries.

III. EUROPE IN SPACE: EU AND MEMBER STATE SPACE ASSETS

EU member states have been actively involved in space activities, including the development and operation of space assets for defence and security purposes, and the EU has fostered cooperation on and harmonization of these efforts. However, a clear distinction must be made between EU space assets—Galileo, the European Geostationary Navigation Overlay Service (EGNOS), Copernicus and the future Infrastructure for Resilience, Interconnection & Security by Satellites (IRIS²)—and the space assets of its most space-capable member states.

EU member states are increasingly engaged in space activities, as is evident from the national space strategies of Austria, Cyprus, Czechia, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovakia, Spain and Sweden. Many of these space assets, such as Athena-Fidus, a French-Italian telecommunications satellite that provides high-throughput secure communications, have been developed and are managed by two or more EU member states. Others, such as CSO, a French military EO satellite programme, are accessed through a Memorandum of Understanding. Hence, it is important to recognize the interdependence among member states in many of these space programmes, such as the 15 members of the EU SST Consortium or the EU member states with common involvement in companies such as Thales Alenia Space (France and Italy) or Airbus (France, Germany and Spain).[27] Four states in particular, France, Italy, Germany and Spain, have developed advanced national space assets for a variety of functions, such as the EO/ISR satellites CERES (France), PAZ (Spain) and COSMO SkyMed (Italy), and SATCOM assets such as SATCOMBw (Germany) and Spainsat (Spain). Beyond these four nations other EU member states are also active in space: Belgium makes a large contribution to the ESA and several bilateral programmes, while Denmark, through its own development of GOMX 4 satellites, is also engaging in space activities. Furthermore, Luxembourg has been remarkably active in the space field, with noteworthy investments in both SATCOM (GovSat-1) and EO (LUXEOSvs) capabilities in recent years. Some member states have opted for national space defence/security strategies, such as France (2019), Italy (2019), Spain (2019) and Luxembourg (2022).[28] Others have included

[23] European Space Policy Institute (ESPI), *Europe, Space and Defence: From 'Space for Defence' to 'Defence of Space', Full Report* (ESPI: Vienna, 2020).

[24] Congressional Research Service (CRS), *Renewed Great Power Competition: Implications for Defence, Issues for Congress* (CRS: Washington, DC, 2023).

[25] Moltz, J. C., 'The changing dynamics of twenty-first-century space power', *Journal of Strategic Security*, vol. 12, no. 1 (2019), pp.15–43.

[26] NATO Research Group, 'NATO London Summit Declaration commitments', 30 Jan. 2020; and NATO, 'NATO's overarching Space Policy', 17 Jan. 2019.

[27] EU Space Surveillance and Tracking (SST), 'What is EU SST?'

[28] French Ministry of Armed Forces, Stratégie Spatiale de Defense [Space defence strategy], Report of the working group on space, 2019; Government of Italy, National Security Strategy for Space, 18 July 2019; Government of Luxembourg, Ministry of Foreign and European

space in their national security agendas. Many EU member states have therefore become reliant on space assets for a number of critical capabilities, such as EO, SATCOM, PNT and SDA, in recent decades.

Earth observation

The EU and its member states have a significant strategic advantage in terms of EO capabilities. The ability to monitor the Earth's environment from space provides critical information for a range of applications, such as climate monitoring and disaster management, and for security and defence purposes. This strategic advantage has been recognized by the EU, which has invested significantly in EO technologies and programmes. One of the key benefits of EO capabilities is the ability to monitor and predict changes in the environment. This is particularly important in the context of climate change, as accurate and timely information is crucial for understanding and mitigating the effects of global warming. The EU's Copernicus programme, for example, provides comprehensive and reliable environmental data to support climate research and natural resource management. Another key application of EO capabilities is in disaster management. The EU's Emergency Response Coordination Centre (ERCC) uses EO data to monitor and respond to disasters such as wildfires, floods and earthquakes. This information enables rapid response and effective disaster management, saving lives and minimizing damage. EO capabilities also play a critical role in security and defence. The EU's Common Security and Defence Policy (CSDP) foresees the use of EO technologies for situational awareness, intelligence gathering and the monitoring of potential security threats. This is particularly relevant in the context of border surveillance and counterterrorism efforts.

Satellite positioning, navigation and timing service

The PNT capabilities provided by satellite-based Global Navigation Satellite Systems (GNSS), such as GPS, are essential to a wide range of applications and services, such as transportation, precision agriculture and emergency response. The EU and its member states recognize the strategic importance of having reliable and secure PNT capabilities to support their economic, social and security objectives. The EU has developed its own GNSS system, Galileo, to provide independent and secure PNT services for Europe. Galileo offers greater accuracy and reliability in higher latitudes than other GNSS systems and provides a signal that is more resistant to interference and jamming.[29] The EU has also developed EGNOS, which augments GNSS signals and improves accuracy for safety-critical applications such as aviation. The EU is also collaborating with international partners, such as the USA, on the development of interoperable and complementary PNT systems. The strategic importance of PNT capabilities for security is particularly evident in military operations. Military forces rely on GNSS signals for navigation, targeting and the timing of operations. GNSS signals are vulnerable to intentional and unintentional interference, however, which can disrupt or degrade military operations. The EU and its member states are therefore investing in technologies to detect and mitigate GNSS interference, while also developing alternative PNT technologies to ensure that military operations can continue even if GNSS signals are disrupted.

Satellite communications

Satellite communications (SATCOM) capabilities are critical for a variety of strategic reasons. SATCOM provides a reliable and secure means of communication for a wide range of applications used in military, civilian and commercial activities. These applications include the transmission of data, voice and images for command and control (C2), intelligence, surveillance and reconnaissance (ISR), logistics, search and rescue, and disaster response.

The EU acknowledges the importance of SATCOM capabilities to its security and defence needs, as well as for broader societal needs. It has developed a comprehensive SATCOM policy that aims to ensure autonomy and resilience in the face of a rapidly changing global environment. EU policy focuses on promoting the development of European SATCOM capabilities, enhancing cooperation among member states and with international partners, and ensuring the availability of secure and reliable SATCOM services.

SATCOM capabilities are critical for enabling military operations and ensuring situational awareness.

Affairs, Directorate of Defense, Defence Space Strategy, 2022, Feb. 2022; and Spanish National Security Council, National Aeroespace Security Strategy, 2019.

[29] EU Agency for the Space Programme, 'Galileo: FAQ', Updated 14 Sep. 2021.

SATCOM can provide secure and resilient communication channels for C2 in military operations, allowing real-time coordination and response. SATCOM can also provide ISR capabilities, allowing the collection and analysis of intelligence information. It also plays a critical role in disaster response, as a means of communication in areas where terrestrial communication infrastructure has been damaged or destroyed.

The European SATCOM industry is a key player in the global SATCOM market with a significant presence in both commercial and military sectors. European companies are involved in the development and production of satellite systems, ground stations and associated equipment and services. The EU has stressed the need to support the European SATCOM industry through research and development, investment and the promotion of international competitiveness.

Space Domain Awareness

The EU and its member states recognize the strategic importance of SDA capabilities, as they play a critical role in ensuring the safety and security of space-based assets, while also enabling effective response to space-related threats. SDA capabilities are essential for monitoring the space environment and identifying potential hazards, such as space debris and other space objects that could pose a threat to satellites and other spacecraft. In recent years, the EU has made significant investments in the development of SDA capabilities, including through initiatives such as the EU SST consortium. The consortium aims to enhance the EU's ability to detect and track objects in space, and will play a key role in supporting the EU's efforts to ensure the safety and security of its space assets. The European space industry plays a critical role in the development of SDA capabilities. A number of companies are involved in the development of SDA-related technologies and services. The EU also underlines the importance of international cooperation on the development of SDA capabilities.

IV. OBJECTIVES OF THE EU SPACE STRATEGY

The EU Space Strategy identifies a number of objectives linked to various actions it lists under the sub-heading of 'Way forward' at the end of each section. As indicated above, one of the overall goals of the EU Space Strategy is to reinforce European strategic autonomy, which is defined as 'the capacity of the EU to act autonomously—that is, without being dependent on other countries—in strategically important policy areas'.[30] First, the document aims to harmonize legislation on and strategic approaches to outer space across the EU, with a focus on ensuring the protection of existing space assets such as Galileo, EGNOS and Copernicus, as well as the development of future assets such as IRIS^2. It also aims to support independent European access to outer space by boosting the development of native EU launchers, such as the Ariane and Vega 'rocket families', as well as native European space launcher start-ups.[31] This objective is regarded as particularly important by the European Commission: '[a]ccess to space is a key enabler and indispensable element in the overall space value chain: without access, there is no space policy'.[32] This notion has been reiterated by ESA Director General Josef Aschbacher: 'Europe has to reacquire this competitiveness on the launcher market which today we do not have'.[33] The situation is accentuated by growing competition from other launcher manufacturers, particularly SpaceX, as Aschbacher has recognized: 'We see the new reality of SpaceX, Falcon 9, and now Starship'.[34] Another objective is to explore the potential transformation of EU space assets into dual-use assets in order to support EU defence efforts and those of its member states. The EU Space Strategy identifies the challenges and opportunities associated with such a transformation and makes recommendations on its successful implementation.

The strategy also seeks to align different sources of funding, such as the Horizon Europe research programme and the European Defence Fund (EDF), with the new defence objectives in outer space.[35] This includes identification of potential funding gaps and how to address them. In addition, the strategy mentions plans to conduct a series of space exercises based on the 'solidarity mechanism' stipulated in the TEU, and to establish SDA capabilities and explore

[30] Damen, M., 'EU strategic autonomy 2013–2023: From concept to capacity'. European Parliament Briefing, *EU Strategic Autonomy Monitor*, July 2022.

[31] Arianespace, Ariane & Vega [n.d.]; PLD Space [n.d.]; and Isar Aerospace [n.d.].

[32] European Commission, 'Access to Space' [n.d.].

[33] Hollinger, P., 'Europe's independent access to space is at risk, says space agency chief', *Financial Times*, 9 Jan. 2023.

[34] David, L., 'Interview: Josef Aschbacher, Director General of the European Space Agency', Spaceref, 24 Apr. 2023.

[35] European Commission, European Defence Fund [n.d.].

synergies with SST and the current Space Programme. SDA is mentioned explicitly in the EU Space Strategy. Finally, the document aims to engage in space defence dialogue with organizations such as the UN and NATO, as well as with key third countries, underlining the centrality of partnerships.

Operationally, the EU Space Strategy foresees the establishment of short-term roadmaps for specific actions. This entails the identification of key milestones and metrics that can demonstrate progress. The strategy also aims to encourage the development of space defence capabilities among EU member states. This objective includes the framing of actions to promote knowledge-sharing and capacity-building among member states, particularly in connection with SDA capabilities. This could translate into the establishment of cost-sharing frameworks among member states, enabling those with SDA capabilities to use SDA in support of an EU response.

Novelties in the EU Space Strategy

Several novelties stand out among the actions foreseen in the EU Space Strategy. First and foremost is the ambitious plan to introduce the development of 'hard power' to outer space.[36] This marks a shift in policy from a focus on mostly scientific and civilian uses of EU space assets to prioritizing defence-oriented applications, including a new version of Copernicus and the future IRIS², in addition to the Galileo component already in the defence domain, the Public Regulated Service. The strategy also aims to harmonize space law among member states. A willingness to allocate substantial resources and establish concrete timelines to achieve this vision is emphasized, demonstrating a clear commitment to the goals outlined. Equally significant are the involvement of the EU Single Intelligence and Analysis Capacity (SIAC) in furnishing annual space threat analyses for the EU, as well as the use of SDA capabilities by the member states that possess them. The EU Space Strategy also seeks synergies among the EDF, the Horizon Europe research programme and the EU Space Programme to support the upgrading of defence capabilities in outer space.[37] Finally, the strategy aims to conduct space military exercises, although their precise format is not specified. The deepening of space defence cooperation with the USA and NATO is equally unprecedented.

The Strategy's contribution

Remarkably, Brussels has for the first time embarked on an active endeavour to acquire hard power capabilities in the space field, as heralded by the Strategic Compass. This shift entails a strategic pivot to dual-use space assets and a combination of EU and member state capabilities. The emphasis on dual-use space assets is noteworthy as it underscores the potential to leverage civilian and military space technology applications to enhance the overall defence capabilities of the EU. This approach is aligned with a growing recognition of the dual-use nature of space assets and their contribution to the EU's pursuit of strategic autonomy by increasing its defence capabilities while allowing it to remain economically resilient and adaptable. Furthermore, the shift to an active role in space defence reflects the proactive approach of the EU to strategic autonomy, as it seeks to enhance its capabilities and contribute to the broader landscape of space security, in line with the ambition of the Strategic Compass.

The economic synergies between the EDF, the EU Space Programme and Horizon Europe are also advanced by the strategy, highlighting that the protection of strategic technologies is essential to maintaining space access. In addition, the positive reception of recent legislation such as the Chips Act and the Critical Raw Materials Act suggests a recognition of the economic implications of space defence.[38] In particular, the reference to the Chips Act, which focuses on securing critical technologies, further reinforces the EU's commitment to protecting its strategic interests in space. The acknowledgement of the economic dimensions of space defence highlights

[36] Nye, J. S., 'Soft power: Propaganda isn't the way', *International Herald Tribune*, 10 Jan. 2003; EU Agency for the Space Programme, 'The EU Space Programme', Updated 21 Nov. 2022; Borrell, J., 'Europe in the Interregnum: Our geopolitical awakening after Ukraine', 24 Mar. 2022; and European Union External Action Service, 'Europe must learn quickly to speak the language of power', 29 Oct. 2020.

[37] European Commission, 'Research and innovation', Horizon Europe; and EU Space Programme, EUSPA.

[38] European Economic and Social Committee, Opinion of the European Economic and Social Committee on 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on "A Chips Act for Europe"' (COM(2022) 45 final) 23 Sep. 2022; and Proposal for a Regulation of the European Parliament and of the Council establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) 168/2013, (EU) 2018/858, 2018/1724 and (EU) 2019/1020.

the interplay between economic and security considerations in the EU's approach to space strategy.

The focus on tangible actions and coordination between EU member states and institutions signifies a notable shift in the EU's stance on space defence. Initiatives in the Strategic Compass provide a roadmap for the EU to pursue a more assertive role in space defence. Plans to achieve short-term milestones reflect a sense of urgency and commitment. Notably, the strategy's timelines feature short-term deadlines for 2023 (establish EU Space SIAC) or 2024 (a roadmap to reduce strategic dependencies on technologies and delivery of pilot SDA service), indicating a proclivity for concrete action. The plan for SIAC to produce an annual classified space threat landscape analysis, including of the evolution of counter-space capabilities, demonstrates this shift. The inclusion of proximate deadlines signifies the EU's intention to prioritize concrete action in the implementation of its Space Strategy. The EU's determination to translate its strategic ambitions into tangible outcomes within a specified timeframe is likely to instil confidence among its industry partners, member states and strategic allies.

Remaining gaps

Despite the positive features of the EU Space Strategy outlined above, the language used in the text sometimes lacks precision, linked to the limitations in the mandates of the EU institutions on defence-related issues. It stands in stark contrast to the language of national space strategies. In the absence of any previous strategic document adopted in the domain of outer space, the EU Space Strategy can only be assessed against comparable strategies from other significant space actors such as the United Kingdom or even one of its own member states, France.[39] The language employed in the EU Space Strategy demonstrates a proclivity for establishing a common narrative rather than a defence-oriented approach, which is characterized by the frequent use of terms that are absent from the space defence strategies of France or the UK. This deviation from the language typical of defence strategies is particularly evident in the absence of references to the search for 'operational superiority' or 'competitive advantage' commonly found in equivalent national documents. This contrast is equally present in the scope of the document and the list of actions to be taken, as national space defence strategies often remark on the need to 'respond to hostile activities in a proportionate and coordinated manner' and 'to take retaliatory measures against an unfriendly act in space'.[40] Although this is expected due to the constraints on the EU's mandate in defence matters, it constitutes a limitation in the development of a defence strategy.

In addition, there are practical obstacles to the stated plans to implement an EU Space Law, which would in principle require modification of the TFEU. Article 189.2 allows for the establishment of a European space programme but excludes any harmonization of the laws and regulations of EU member states.[41] Nonetheless, the EU did adopt a proposal for a Regulation on secure space connectivity in 2023 and a Joint Communication on a European approach to space traffic management in 2022.[42] In particular, the Joint Communication sets out an EU approach to space traffic management that aims to frame concrete initiatives, both operational and legislative, to promote the safe, secure and sustainable use of space while preserving the strategic autonomy of the EU and the competitiveness of industry. This kind of initiative could serve as a baseline to make advances in areas that are not covered by national legislation, and to progressively foster convergence in space law at the EU level.

The obstacles are more daunting at the technical level than on the legal front. The transformation to dual-use assets faces various limitations, particularly in the domains of EO and Copernicus.[43] The refresh rate of images, which takes place at intervals of several days, and the maximum resolution of 10 metres both fall short of the requirements of defence applications.[44] This constitutes a failure of the technical capability of EU space assets to meet defence needs. Of course,

[39] British Ministry of Defence, *Defence Space Strategy: Operationalising the Space Domain*, Feb. 2022; and French Ministry for the Armed Forces, Space Defence Strategy, Report of the Space Working Group, 2019.

[40] British Ministry of Defence (note 39); and French Ministry for the Armed Forces (note 39).

[41] Treaty on the Functioning of the European Union, Consolidated version, 13 Dec. 2007.

[42] European Parliament, Regulation (EU) 2023/588 of the European Parliament and of the Council of 15 March 2023 establishing the Union Secure Connectivity Programme for the period 2023–2027; and Joint Communication to the European Parliament and the Council, An EU Approach for Space Traffic Management An EU contribution addressing a global challenge, 2022.

[43] European Space Agency, 'Technical Guide Overview'.

[44] Sentinel Online, 'Technical Guide overview'.

national sensitivities play a role too. Experts stress that the lack of involvement of the defence ministries of member states in the creation of the EU Space Strategy could negatively affect its implementation.[45] Finally, the stated intention 'to deepen cooperation in space security with the US' raises concerns about a potential external dependence.[46] Some ambiguity persists on the role of transatlantic cooperation: the whole exercise is about building 'strategic autonomy' but it is difficult not to envisage cooperation with the USA. The extent to which such cooperation might result in reliance on the US in space security matters warrants careful consideration, as it could conflict, at least theoretically, with the declared ambition to become strategically autonomous, which is a clear objective of HR Josep Borrell.[47]

V. RECOMMENDATIONS

Space has become an increasingly critical domain for defence and security. States now rely on space-based assets for a wide range of capabilities, from communications to navigation, intelligence gathering and surveillance. As the EU seeks to enhance its space capabilities and protect its space-based assets, several actions should guide future development of its Space Strategy for Security and Defence.

A first recommendation, aligned with the aim of developing and diversifying defence-related capabilities, is to make the pilot phase of the new version of Copernicus a template for the development of EU space capabilities in support of hard power. Copernicus, the EU's EO programme, has successfully provided vital data for civilian and security applications such as environmental monitoring and disaster management. Building on this success, the Copernicus pilot can be leveraged to develop space capabilities that support military operations, such as surveillance, intelligence gathering and target identification. The EU can use Copernicus infrastructure, expertise and data to enhance its situational awareness, decision-making and operational effectiveness in support of hard power. This would be one of the first capability developments within the EU purely driven by a defence agenda, which could set a precedent for the future development of other defence capabilities within the EU. In time, it may even open the door for the EU to acquire additional defence competences.

A second recommendation is to create a formal framework for coordination on defence matters between member states with space capabilities and those without. Space capabilities are not evenly distributed among EU member states. Some possess advanced space programmes while others lack space assets altogether. To ensure a coordinated and cohesive approach to space defence, a formal framework for cooperation should be established among member states. This could involve sharing information, expertise and resources related to space-based assets, as well as joint planning and execution of space defence operations. This would require a level of agreement between member states that heavily involves their defence ministries as part of the process from the start. One example of this kind of coordination is the EU SST consortium, which pulls together the capabilities of several member states. Such collaboration would enhance the collective defence capabilities of the EU, ensure equitable access to space-enabled capabilities and promote interoperability among member states.

A third recommendation is to conduct an analysis of recent developments in the US space launcher industry when developing strategies to ensure long-term EU autonomous access to space, and to note the successes of SpaceX in particular.[48] This would help plan a strategy to boost the competitiveness of the EU launcher industry, and also when designing new EU launcher systems.

The harmonization of space law among member states could also be advanced in areas that are not covered by national legislation, in a progressive move towards convergence in space law at the EU level. Space is governed by various international treaties, agreements and norms, but space law still needs to converge among EU member states for there to be a coherent and unified approach to space defence. This would involve developing common standards, regulations and procedures related to space activities, such as on space debris mitigation, space traffic management and the protection of space-based assets. A harmonized and convergent space law framework would facilitate the smooth implementation of the EU

[45] Authors' anonymous interviews with subject experts, Jan. to Apr. 2023.

[46] European Commission (note 1), p. 17.

[47] Borrell, J., 'Por qué es importante la autonomía estratégica europea' [Why is European strategic autonomy important?], Elcano Royal Institute, 23 Dec. 2020.

[48] Reddy, V. S., 'The SpaceX effect', *New Space*, vol. 6, no. 2 (2018),pp. 125–34.

Space Strategy, promote transparency, accountability and responsible behaviour in space, and ensure compliance with international obligations.

Finally, the EU should take advantage of the expertise developed in space by established EU agencies such as the European Union Satellite Centre (SatCen), to ensure smooth implementation of the various components of the EU Space Strategy, with a particular focus on the new version of Copernicus. SatCen, with its experience in geospatial intelligence, satellite imagery analysis and monitoring of global events, can provide valuable support in the development and execution of space defence operations.[49] A similar case can be made concerning the provision of new SDA services in support of EU response, where the knowledge and experience of the EU SST consortium, in which SatCen participates, could be highly valuable.[50] By leveraging the expertise and capabilities of established EU agencies, Brussels can avoid duplication, promote efficiency and ensure the optimal use of resources in implementation of its space strategy.

VI. CONCLUSIONS

The EU Space Strategy announced in the Strategic Compass represents a significant development as the EU assumes an active role in acquiring hard power capabilities in space. The text reflects a strategic pivot towards dual-use space assets and coordination among member states and EU institutions, featuring short-term goals that demonstrate a commitment to tangible results. The emphasis on economic synergies and references to the Chips Act demonstrate the interplay between economic and security considerations in the EU's approach to space strategy, aligned with its pursuit of strategic autonomy. However, a critical analysis reveals some limitations of the strategy. The language and scope of the document deviate from those characteristic of national space defence strategies. The EU cannot use the language of sovereign states and lacks full competences in defence policy. It will remain impossible for the EU to frame a Space Strategy comparable to conventional space strategies for as long as member states retain these competences. Instead, the focus resides in establishing a baseline of actions to protect the EU's space assets and on coordination with national space defence strategies. These could progressively converge into a unified Space Strategy for all member states, provided that the EU is endowed with additional competences. Furthermore, plans to implement an EU Space Law will require modification of the TFEU, making harmonization of areas not covered by national legislation the most likely scenario, given the considerable effort required for treaty change.

Copernicus requires a technical upgrade before it can achieve dual-use status. The new version of Copernicus mentioned in the strategy will probably be designed with defence requirements in mind and, according to the Multiannual Financial Framework for 2021–27, will be piloted by 2027.[51] This offers some operational capabilities but it is still unclear how the new Copernicus version will be managed and what the requirements would be to access it. Finally, plans to deepen cooperation on space security with the US raise concerns about potential dependence on external partners. While cooperation with the US would undoubtedly help to enhance capabilities, reliance on external partners might compromise the EU's pursuit of strategic autonomy in space security matters, as it would have an impact on 'the capacity of the EU to act autonomously . . . in strategically important policy areas'.[52]

In conclusion, addressing legal and technical constraints, and potential dependence on external partners will be key to the effective implementation of a robust and autonomous space action by the EU. However, the significance of the EU Space Strategy resides in the fact that it reflects an unprecedented drive for a transition from a mostly civilian to a civil/military use of outer space by leveraging dual-use assets. This rationale sets the document apart from previous strategies, which were mostly about prioritization of a specific security agenda, or about mobilizing the EU's diverse toolbox in support of foreign policy objectives. The step of adding a defence dimension to a traditionally civilian approach, effectively transforming assets into dual-use capabilities, dovetails with the trend, visible in the sequencing of strategic documents outlined above, to present EU institutions as security relevant.[53]

[49] See European Union Satellite Centre.

[50] See EU SST, 'What is EU SST'.

[51] Council of the European Union, 'Long-term EU budget 2021-2027 and recovery package', Updated 14 Mar. 2023.

[52] Damen (note 30).

[53] Portela, C., 'Community policies with a security agenda: The worldview of Commissioner Benita Ferrero-Waldner', *RSCAS Working Paper* no. 10 (Robert Schuman Centre: San Domenico di Fiesole, 2007).

This drive often stems from the Commission, which seems to have identified in the security-significance of its policies a source of centrality difficult to obtain from purely civilian activities, regardless of their importance. For the time being, the EU Space Strategy will be successful if it manages to encourage a transition to a dual-use approach to space assets, setting in motion a process that could create momentum for stronger cooperation among EU member states in space defence or, eventually, the reinforcement of EU competences in space policy.

ABBREVIATIONS

ASAT	Anti-satellite
CSDP	Common Security and Defence Policy
EDA	European Defence Agency
EGNOS	European Geostationary Navigation Overlay Service
EO	Earth observation
EU	European Union
EU Space Strategy	European Union Space Strategy for Security and Defence
ERCC	Emergency Response Coordination Centre
ESA	European Space Agency
GNSS	Global Navigation Satellite Systems
IRIS²	Infrastructure for Resilience, Interconnection & Security by Satellites
ISR	Space-based intelligence, surveillance and reconnaissance
NATO	North Atlantic Treaty Organization
PNT	Positioning, navigation and timing
SatCen	Satellite Centre
SATCOM	Satellite-based communication
SDA	Space Domain Awareness
SIAC	Single Intelligence and Analysis Capacity
SST	Space Surveillance and Tracking
TFEU	Treaty on the Functioning of the European Union

LIST OF RECENT NON-PROLIFERATION AND DISARMAMENT PAPERS

Armed Conflict And Nuclear Security: Implications For Europe
Non-Proliferation and Disarmament Paper no. 82
Muhammed Ali Alkiş
April 2023

Opportunities for the European Union to Strengthen Biosecurity in Africa
Non-Proliferation and Disarmament Paper no. 81
Benjamin Wakefield
November 2022

Hypersonic Missile Proliferation: An Emerging European Problem?
Non-Proliferation and Disarmament Paper no. 80
Timothy Wright
May 2022

Balancing the Three Pillars of the NPT: How can Promoting Peaceful Uses Help?
Non-Proliferation and Disarmament Paper no. 79
Ingrid Kirsten and Mara Zarka
May 2022

Navigating Chinese–Russian Nuclear and Space Convergence and Divergence
Non-Proliferation and Disarmament Paper no. 78 Lora Saalman
May 2022

Implementing the 2021 Recast of the EU Dual-use Regulation: Challenges and Opportunities
Non-Proliferation and Disarmament Paper no. 77 Mark Bromley and Kolja Brockmann
September 2021

A Comparison of National Reviews of the Treaty on the Prohibition of Nuclear Weapons
Non-Proliferation and Disarmament Paper no. 76
Michal Onderco and Andrea Farrés Jiménez June 2021

Effective and Comprehensive CBRN Security Risk Management in the 21st Century
Non-Proliferation and Disarmament Paper no. 75
Maurizio Martellini and Tatyana Novossiolova June 2021

This document has been produced with the financial assistance of the EU. The contents are the sole responsibility of the EU Non-Proliferation and Disarmament Consortium and can under no circumstances be regarded as reflecting the position of the EU.

A EUROPEAN NETWORK

In July 2010 the Council of the European Union decided to support the creation of a network bringing together foreign policy institutions and research centers from across the EU to encourage political and security-related dialogue and the long-term discussion of measures to combat the proliferation of weapons of mass destruction (WMD) and their delivery systems. The Council of the European Union entrusted the technical implementation of this Decision to the EU Non-Proliferation Consortium. In 2018, in line with the recommendations formulated by the European Parliament the names and the mandate of the network and the Consortium have been adjusted to include the word 'disarmament'.

STRUCTURE

The EU Non-Proliferation and Disarmament Consortium is managed jointly by six institutes: La Fondation pour la recherche stratégique (FRS), the Peace Research Institute Frankfurt (HSFK/ PRIF), the International Affairs Institute in Rome (IAI), the International Institute for Strategic Studies (IISS–Europe), the Stockholm International Peace Research Institute (SIPRI) and the Vienna Center for Disarmament and Non-Proliferation (VCDNP). The Consortium, originally comprised of four institutes, began its work in January 2011 and forms the core of a wider network of European non-proliferation and disarmament think tanks and research centers which are closely associated with the activities of the Consortium.

MISSION

The main aim of the network of independent non-proliferation and disarmament think tanks is to encourage discussion of measures to combat the proliferation of weapons of mass destruction and their delivery systems within civil society, particularly among experts, researchers and academics in the EU and third countries. The scope of activities shall also cover issues related to conventional weapons, including small arms and light weapons (SALW).

www.nonproliferation.eu

EU Non-Proliferation and Disarmament Consortium

Promoting the European network of independent non-proliferation and disarmament think tanks

FONDATION pour la RECHERCHE STRATÉGIQUE

FOUNDATION FOR STRATEGIC RESEARCH

www.frstrategie.org

PRIF Peace Research Institute Frankfurt — HSFK Hessische Stiftung Friedens- und Konfliktforschung

PEACE RESEARCH INSTITUTE FRANKFURT

www.hsfk.de

iai Istituto Affari Internazionali

INTERNATIONAL AFFAIRS INSTITUTE

www.iai.it/en

IISS

INTERNATIONAL INSTITUTE FOR STRATEGIC STUDIES

www.iiss.org/en/iiss-europe/

sipri

STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE

www.sipri.org

VCDNP
Vienna Center for Disarmament and Non-Proliferation

VIENNA CENTER FOR DISARMAMENT AND NON-PROLIFERATION

www.vcdnp.org