

# EU space strategy for security and defence

## SUMMARY

Space is becoming an increasingly contested domain. The Russian war of aggression in Ukraine highlights the key role of space-based connectivity for the conduct of military operations and the continuity of public services. The Strategic Compass for Security and Defence underlines the increasingly contested nature of space, recognises space as a strategic domain and accentuates the need to boost the security and defence dimensions of the EU in space. EU Member States have therefore committed to adopt an EU space strategy for security and defence; this was put forward by the Commission on 10 March 2023.

Recognition by the EU and its Member States of the importance of space and defence has led to an increase in the development and use of space assets for defence and security objectives over the past decade. Space and defence capability development is advancing, with several European Defence Fund and permanent structured cooperation (PESCO) projects developing the capabilities that the EU will need in the space and defence sphere. Synergies are being sought between the civil, defence and space industries. The EU is also increasingly involved in global governance on space issues, working to enhance its partnerships on space security, for instance with the United States and with the North Atlantic Treaty Organization.

The European Parliament's Committee on Foreign Affairs has adopted an own-initiative report on the Strategic Compass and EU space-based defence capabilities, in which it welcomes 'the findings and high level of ambition in the recommendations proposed in the EU space strategy in the area of security and defence'. The Council has meanwhile adopted conclusions on the EU space strategy for security and defence, welcoming it and supporting its main points.



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## Introduction

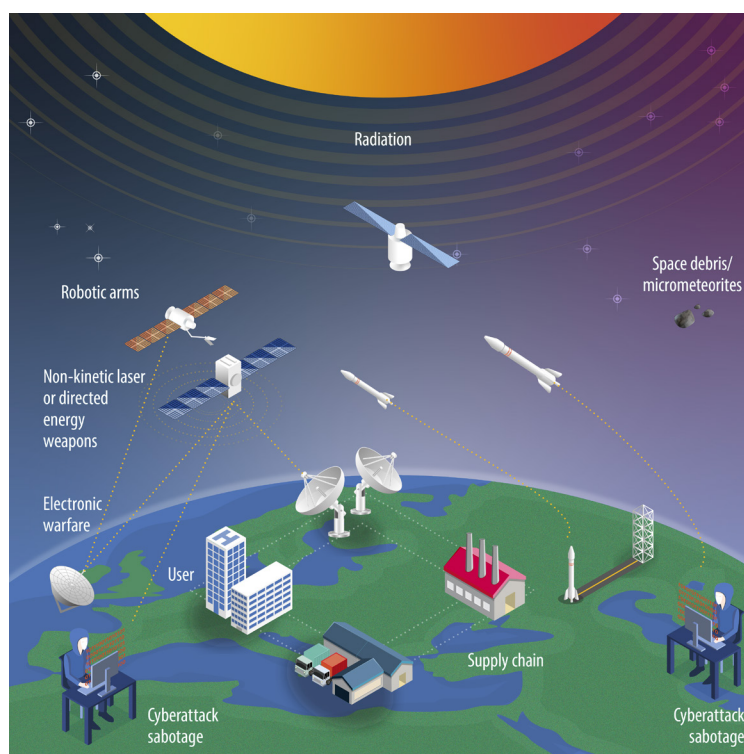
The [Strategic Compass](#) for Security and Defence – a practical plan of action to strengthen the EU's security and defence by 2030 – notes the increasingly contested nature of space, recognises it as a strategic domain and highlights the need to boost the EU's security and defence in space. The competitive and disputed nature of the space domain, and Europe's growing reliance on space equipment and services, were already addressed in the 2016 [EU Global Strategy](#) and [space strategy](#). The 2022 Strategic Compass emphasised these ideas even more and urged the development of a specific plan of action to counter the dangers to EU space assets. EU Member States therefore committed to adopt an EU space strategy for security and defence by the end of 2023. The European Commission and the High Representative/Vice-President of the European Commission (HR/VP) then issued the first-ever [EU space strategy for security and defence](#) on 10 March 2023. Josep Borrell, the HR/VP, [explained](#) that 'without security, there can be no future in Space... for the first time, we are putting forward a strategy that will pull together all our tools to protect EU space assets and ensure that everyone can benefit from space services'.

## The space domain and space threats

According to the [EU space strategy for security and defence](#) 'the space domain includes any element relevant for the functioning of space systems and the delivery of space-based services in the EU and the Member States'. Space is an increasingly [contested](#) domain. Threats to space activities [fall](#) into two categories. Unintentional threats like space debris are one. In 2009, thousands of pieces of space debris were produced when, for the first time in history, a satellite collided with another satellite in outer space. Private businesses are launching an increasing number of satellites. Space congestion is increasingly becoming an issue, especially with the advent of private space businesses. For instance, private aerospace company SpaceX manages about 4 000 Starlink satellites and has plans to launch more satellites to offer internet connectivity globally. The risks of satellite collisions and space debris are therefore rising.

The hostile deployment of counterspace capabilities intended to obstruct rivals' use of space constitutes the other – intentional – category of threats in space. Counterspace capabilities are used to intimidate rivals, prevent them from using their space systems, or gain informational advantages. They are focused on orbiting space assets, the ground infrastructure that supports them, and the data linkages that connect them. Indeed, the [development](#) of space technologies for both offensive and defensive purposes has in recent decades been actively pursued by several major powers, including China, India, Russia, and the United States (US), with some EU Member States, such as Germany, Spain, France and Italy, also developing defensive capabilities. Multiple different counterspace [technologies](#) that could endanger the space assets of EU Member States are being developed and tested. These

Figure 1 – Space threats



Data source: [European Commission](#), 2023. Graphic by Samy Chahri.

include kinetic physical, non-kinetic physical, electronic and cyber-counterspace devices. For instance, a satellite can be struck directly by ascent weapons (such as missiles) and indirectly by co-orbital weapons, which are launched into orbit before being directed to hit their target. The threat posed by counterspace capabilities was clearly demonstrated on 15 November 2021, when Russia [carried out](#) a direct-ascent hit-to-kill anti-satellite (ASAT) test that smashed a Russian satellite into more than 1 500 pieces of orbital debris (China [conducted](#) a similar test in 2007). The nature of the space realm, especially in orbit close to Earth, means that weapons tests like these against any satellite can [jeopardise](#) the space assets of other nations, and endanger the continuous delivery of space-based services. Commissioner for the Internal Market Thierry Breton [remarked](#) at the 2022 EU Space Conference that 'Space is a strategic area where big powers are now competing. ... Europe must defend its interests and freedom to operate in space'.

Space communication and remote sensing technology have also made [headlines](#) in the context of Russia's invasion of Ukraine. While a fleet of Earth observation satellites saw Russia's pre-war military build-up and advances toward Kyiv, commercial satellite services ensure that Ukrainians have dependable internet connectivity and communications. Russia sought to [disable](#) space-based assets used by Ukraine prior to its invasion with a plethora of cyber-attacks. On 24 February 2022, an hour before Russia's invasion began, a 'multi-faceted' attack was [launched](#) against the private satellite provider Viasat's KA-SAT network, which [provides](#) high-speed satellite internet coverage for Europe. The attack, [blamed](#) by both Ukrainian and Western intelligence officials on Russia, was probably intended to weaken Ukraine's command and control capabilities of Ukraine, as the satellite network was being [used](#) by the Ukrainian government, the Ukrainian army, and Ukrainian security services. It [disrupted](#) broadband service for thousands of Ukrainian customers and other fixed broadband customers throughout Europe. According to the European Space Policy Institute: 'The KA-SAT cyber-attack [demonstrates](#) that commercial space systems are essential tools to support military operations on Earth, but also prime targets to (cyber-)attack'. Space-based assets are also critical in Ukraine's response to the Russian invasion: Ukraine's military and civilian reaction to Russia's invasion [relies](#) heavily on Starlink. Using a mobile network made possible by Starlink, Ukrainian soldiers upload pictures of potential targets. These are conveyed to an artillery-battery commanders-only encrypted group chat. These commanders then determine if and where to shell the target. Compared to current methods of fire coordination, it is far faster. No other army has ever had access to this level of connectivity.

## Increasing EU and Member State space activities

Despite the increasingly contested nature of space and the proliferation of counterspace capabilities and the threat this poses to the vital security and defence interests of the EU and its Member States, most EU Member States did not make security or military uses of space a high priority for most of the [post-Cold War era](#) (France and the UK being notable exceptions). Over the past 10 years this has changed however: the pace of development and use of space assets for defence and security objectives has [increased](#) in EU Member States. The EU has encouraged coordination and standardisation of these efforts. In addition to EU space assets (see box on EU space initiatives below), many EU Member States have space assets that were created and are operated by two or more EU Member States, such as the French–Italian secure communications satellite [Athena-Fidus](#). It is critical to recognise how interdependent Member States are in many of these space programmes already, such as the 15 countries that make up the EU Space Surveillance and Tracking ([SST](#)) Consortium for which the EU's space programme has [served](#) as the 'front desk' since 2023. EU Member States also collaborate with one another through joint ventures such as Thales Alenia Space (France and Italy) and the multi-national aerospace company Airbus (Germany, Spain and France). Moreover, 19 of the 27 Member States already have [national space strategies](#). Since 2019, [France](#) even has a specific space and defence strategy, and [established](#) a military space command in 2019. Germany also launched a military space command in 2021.

At EU level, in 2021, the Commission [created](#) a Directorate-General for Defence Industry and Space (DG DEFIS), which implements the EU space programme. It has also invested in the research and development of space defence capabilities. Several recent EU documents reflect the growing importance of the defence and space domain, such as the March 2022 Strategic Compass and the Commission's February 2022 [contribution](#) to European defence. The EU Strategic Compass notes that 'Our freedom of action depends on safe, secure and autonomous access to the space domain'. It recognises that 'competition in this domain has strong security and defence implications. It is key for observation, monitoring, navigation and communication capabilities, but it is a congested and contested domain, as illustrated by irresponsible behaviours of strategic competitors'. More broadly, the Strategic Compass highlights how access to space has become increasingly contested in the modern era of complex security concerns and strategic competitiveness. According to Daniel Fiott, Head of the Defence and Statecraft programme at the Centre for Security, Diplomacy and Strategy of the Brussels School of Governance, this marks a [paradigm shift](#) in how the EU sees space and defence, and recognition at the highest political level that space and defence cannot be ignored.

### EU space initiatives

[Regulation](#) (EU) 2021/696 of 28 April 2021 established the EU's 2021-2027 space programme, simplifying the existing EU legal framework and governance system and bringing together existing EU programmes, such as Copernicus, Galileo and EGNOS. It aims to ensure the continuous provision of high-quality secure space-related data, information and services, to maximise the socio-economic impacts of the investments, and enhance the EU's security. It also introduces new security components, such as the new Governmental Satellite Communication (GOVSATCOM) initiative to monitor space hazards and provide national authorities with access to secure satellite communications. The programme has a budget of €14.88 billion (current prices) and has the following components:

- ✓ [Galileo](#) is an autonomous civilian global navigation satellite system (GNSS). Today, with 22 operational satellites, it is in its final phase of deployment and already offers three services ([Open Service](#), [Public Regulated Service](#), [Search and Rescue service](#)).
- ✓ The [European Geostationary Navigation Overlay Service](#) (EGNOS) is a civilian regional satellite navigation system.
- ✓ [Copernicus](#) is an operational, autonomous, user-driven, civilian Earth observation system.
- ✓ [Space Situational Awareness](#) (SSA) includes a space surveillance and tracking system (SST sub-component), observational parameters related to space weather events (SWE sub-component), and risk monitoring of near-Earth objects approaching the Earth (NEO sub-component).
- ✓ [GOVSATCOM](#) is a satellite communications service under civilian and governmental control.

In addition, with the [regulation](#) establishing the Union's 2023-2027 secure connectivity programme, the Union invested a further €2.4 billion (current prices), to build infrastructure on the ground and in orbit to ensure worldwide access to secure governmental satellite communication services for the protection of critical infrastructures, surveillance, external actions and crisis management by 2025. The infrastructure might then be used further for commercial services.

The EU space strategy for security and defence builds on these efforts. It underlines space as a strategic domain for the EU, critical to its strategic autonomy as a 'global space power'. The strategy notes that to protect the strategic interests of the EU and thwart hostile space activity, more measures are required, including a better joint understanding of the space threat landscape. The HR/VP has therefore committed to compile an annual, classified analysis of the space threat landscape at EU level, using intelligence from Member States. While this shift in perception is certainly important, Fiott [warns](#) that politics will ultimately determine whether the EU can make a genuine transition to meaningful recognition of the military risks of space. Member States, he argues, will choose the plan that best reflects their normative vision of space (civilian or military) given that the EU space strategy for security and defence co-exists with the EU space strategy rather than replacing it. One consideration is likely to be that a 'defence-oriented' approach to space may generate technical needs that cannot be addressed by civilian small and medium-sized enterprises (SMEs). He notes that it is also unclear whether all Member States would be willing to adopt a more

militarised approach to space, even with the new EU strategy. Another [expert](#) notes that the space strategy for security and defence will be a 'game changer' for future military space activities'. Once it is put into practice, Member States will have a shared goal and greater motivation to increase their investments. EU space initiatives complementing national, international, and intergovernmental efforts will be crucial as they will greatly improve the EU's capacity to act decisively in this area.

## Resilience and protection of EU space systems and services

The United Nations (UN) Office for Disaster Risk Reduction defines [resilience](#) as 'the ability of a system, ... exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management'. The relevance of resilience to the space policy domain lies in the relevance of the services provided by the space assets, but also in the existence of a wide range of threats on Earth and in orbit, both man-made (for instance shooting, jamming, space debris, cyberattack) and natural (for instance space weather events, [near-Earth objects](#)). A taxonomy of space threats should factor in the nature of the threat, as well as the scale of its likely effects. The notion of resilience gained [traction](#) in international proceedings on space law in the UN only from the decade 2010.

In the EU, while [Regulation](#) (EU) 2021/696 (the EU Space Regulation) mentions 'resilience' only four times, it underpins to a large extent the scope and objectives of the programme. In fact, the inclusion of space situational awareness (space surveillance and tracking, space weather events, and near Earth objects) among the main components substantiates the role of resilience in space programme planning. In this case, the risks associated with operations in orbit are expected to be assessed and mitigated by a dedicated set of activities. Resilience is also a corollary of part of the programme's general objectives, as enshrined by Article 4(1)(a) of the EU Space Regulation: 'provide or contribute to the provision of high-quality and up-to-date and, where appropriate, secure space-related data, information and services without interruption and wherever possible at global level, meeting existing and future needs and able to support the Union's political priorities'. Some of the regulation's specific objectives reinforce this resilience objective: for instance on Galileo and EGNOS, where the programme should 'ensure the continuity and robustness of the service' (Article 4(2)(a)).

The space programme also seeks to bolster the resilience of EU space systems by encouraging EU autonomous access to space. According to recital 6 of the Space Regulation, it is 'essential that the Union supports autonomous, reliable and cost-effective access to space, especially as regards critical infrastructure and technology, public security and the security of the Union and its Member States'. Article 5 then provides for the pooling of launch services among Member States, and technological investments to provide innovative solutions to ensure such autonomous access to space.

The resilience of EU space assets and systems depends on the autonomy of the EU across space value chains, which go well beyond the deployment and operation of space assets. In its 2016 [communication](#) on a space strategy for Europe, the Commission had already identified technological dependency as a risk to the resilience of the EU space sector. For instance, the space sector relies intensively on [semi-conductors](#), for which the EU is currently set to [invest](#) to reduce its dependency from third countries. The Commission, the European Defence Agency (EDA) and the European Space Agency (ESA) drafted a joint [document](#) to identify critical space technologies for European strategic non-dependence, and a plan of action to be taken between 2021 and 2023.

In its [2023 communication](#) on an EU space strategy for security and defence, the Commission outlines four complementary sets of actions to ensure the resilience of space systems and services. First, in 2024, it will adopt a proposal for a legislative act to define common EU rules on space operations, against a current backdrop where not all Member States have their own legal framework on this matter. A second priority is to strengthen the EU's technological sovereignty, through investment in the relevant EU programmes, such as the EU space programme and Horizon Europe, but also through the continuation of the joint task force activities mentioned above. The third

priority is the reinforcement of EU space capabilities, including ensuring the EU's access to space. A last priority will seek to ensure the EU's open strategic [autonomy](#) through the relevant value chains of the space industries. In its 2023 strategic foresight [report](#), the Commission identifies space as a policy domain for which the EU and Member States should develop tools to assess their dependencies. On 6 November, the ESA's Ministerial Council adopted a [resolution](#) identifying the space launcher sector as a domain where Europe's current dependencies must be overcome.

## Responding to space threats

Responding to space threats requires the capacity to monitor and understand the events happening in the space domain, and capabilities to assess the information, design a response, and enforce it. Growth in space launches and satellites put in orbit heightens the risk of traffic congestion in space. The monitoring of space objects is therefore as important as the capacity to monitor space weather events and near-Earth objects. EU [capabilities](#) in space surveillance and tracking currently hinge on the space surveillance and tracking component established under Articles 54 to 59 of the EU Space Regulation. They are limited to ground-based and space-based infrastructure provided by participating Member States, ensuring the security of approximately 280 EU satellites, out of over [5 000](#) active globally in 2022. In 2022, a joint Commission-HR/VP [communication](#) on an EU approach to space traffic management (STM) includes a commitment to improve the scope and precision of this monitoring, providing by mid-2023 a design for an architecture analysis of future STM needs for a EU space surveillance and tracking (SST) system, able to detect all objects above 10 cm. The deployment is expected to start by 2025. Along with an information network of national authorities to be included in the upcoming EU space law, the deployment of the upgraded EU SST system would equip the EU with [space domain awareness](#) capacity – the capacity to detect, identify and characterise space objects of interest in near real time, describe and understand their behaviour, and connect this information to underlying doctrines and related space systems, on a real time basis.

At the time of writing, the EU response to space threats is based on Council [Decision](#) (CFSP) 2021/698 on the security of systems and services deployed, operated and used under the space programme that may affect the security of the Union. It empowers the Council and the HR/VP to address instructions to the EU Space Agency, or any other structure, to avert a threat, or to mitigate serious harm arising from the deployment, operation or use of EU space programme systems and services. The [2023 communication](#) on an EU space strategy for security and defence calls for changes to the Council decision to extend its scope to threats in the space domain that may affect the [security](#) of the EU. Importantly, the communication stresses that a space threat may trigger the request of the mutual assistance clause included in [Article 42\(7\)](#) of the Treaty on European Union, 'should a space threat or incident amount to an armed attack on its territory'. According to [Fiott](#), this could necessitate a potential military response, which is new territory for the EU. This and the focus on 'response' according to the expert, mean that the EU must 'forge ahead with a more military approach to space' in order for it to be credible.

## EU space capabilities for security and defence

The use of space for defence and security purposes acts as a potent [force multiplier](#), improving military operations' efficacy and the resilience of vital infrastructure and public services. Critical capabilities, such as intelligence, surveillance and reconnaissance (ISR) can be provided by space-based assets, allowing for global monitoring of all types of activity. As noted above, a prime example of this is Ukraine's heavy [reliance](#) on Starlink satellites for its military operations. The technology greatly simplifies drone warfare. A Ukrainian naval drone with what seemed to be a Starlink terminal attached to its stern washed ashore in Sevastopol – the headquarters of Russia's Black Sea Fleet – in September. Seven such drones were [deployed](#) to launch a successful attack on the port at the end of October. As one Ukrainian soldier puts it: 'Starlink is our oxygen... Our army would collapse into chaos' if it disappeared. The EU space strategy for security and defence therefore suggests making the most of space for defence and security needs. When planning EU space programme

development, it is necessary to take defence needs into consideration in the creation of dual-use services. This is significant as it is the first time the EU has sought to acquire 'hard power capabilities in the space field', marking a [shift](#) away from mainly scientific and civilian uses of EU space.

The strategy proposes two pilot programmes: one to supply initial space domain awareness services by the end of 2024, building on Member States' capacity, and another to introduce a new governmental Earth observation service within Copernicus while enhancing current resources.

Recognising that there is no universally accepted definition for space domain awareness, [Fiott](#) describes it as a combination of fusion and action. Fusion is the capacity to track, identify, survey, and evaluate the full range of space risks and threats (military and non-military), as opposed to only some aspects of it. Action refers to the capacity to use the fusion of space data to directly inform strategic decisions and policy-making in as real-time a manner as possible. The strategy also promises to enable synergies and cross-fertilisation, not least in terms of research and development, and to connect space, defence, and security more effectively at EU level. It also proposes specific measures to encourage cooperation and skill development among defence and space start-ups.

The EU is already making progress on developing the future space defence capabilities that it will require. Information superiority and management, intelligence, surveillance and reconnaissance, Earth observation, positioning, navigation and timing (PNT), space situational awareness (SSA), satellite communication, and cyber-defence were previously identified as critical space-defence technologies in the EDA's [capability development plan](#) (CDP) in 2018's capability focus areas. One of the six focus capability areas listed in the 2022 [coordinated annual review on defence](#) (CARD) report as benefiting from closer EU cooperation is 'defence in space'.

Permanent structured cooperation (PESCO) and the European Defence Fund (EDF) and its precursors are being used to advance space defence research and capability development. The EU spent over €3 million on space defence research within the framework of the preparatory action on defence research ([PADR](#)) from 2017 to 2019. The European Commission funded the [QUANTAQUEST](#) and [OPTIMISE](#) projects through the PADR, both seeking ways for the EU to prevent disruptions in space. It also spent close to €90 million within the framework of the European Defence Industrial Development Programme ([EDIDP](#)) on space defence capability projects over the 2019 to 2020 period. For example, the goal of the [INTEGRAL](#) project was to create a command and control (C2) system, assisted by AI and using SSA data produced by military space assets.

One key focus of the EDF's 2021 work programme was to strengthen the EU's navigation warfare (NAVWAR) capabilities under its first ever call for proposals. The Commission went on to [invest](#) in nine different projects (totalling around €171.3 million, or roughly 15 % of that year's €1.2 billion EDF budget) that were explicitly focused on space defence capabilities within the NAVWAR call. Three other projects were designed to protect the EU's current space assets. They ensure that the Galileo Public Regulated Service (PRS) is secured by the creation of new ground and space-based architectures ([Navguard](#)), and that satellite communications are protected ([EPW](#) and [RFSHIELD](#)). Three projects in the 2022 EDF round, totalling approximately €150 million or roughly 20 % of available funding, focus on space and defence. These are [SPIDER](#) (feasibility study on development of multi-mission affordable satellites constellations in ISR); [REACTS](#) (resilient and scalable network of responsive space systems, fully interoperable, able to launch satellites and commence data delivery within 72 hours); and [ODIN's EYE II](#) (European space-based missile early warning).

In a sign of progress on collaboration in space and defence, these projects involve companies in a multitude of Member States. ODIN's EYEII for instance involves 38 companies from 14 Member States. In the [2023 EDF call for proposals](#) another €125 million are set aside (roughly 10 % of the 2023 total EDF budget) for specific space and defence projects on 'Threat surveillance and protection of space-based assets' and 'Initial operational capacity for space situational awareness C2 and sensors', while the specific calls for SMEs may also involve space-related projects. Together with the European Commission, the European Investment Bank (EIB) [offers](#) direct venture loans for later-stage space ventures. It has launched programmes such as [CASSINI](#) to support entrepreneurship in

space-related businesses across the EU. With recent combined €45 million financing in space companies, including [GomSpace](#), [Spire Global](#), [D-Orbit](#), and [EnduroSat](#), the EIB is a major investor in emerging space technology in the EU. For instance, an EIB loan will fund GomSpace's nanosatellite platform – nanosatellite technology has potential for dual-use [applications](#).

Member States have also sought to develop space and defence capabilities within the framework of permanent structured cooperation. PESCO now numbers [five](#) distinct space-related projects. Through a mix of improved space-based early warning and endo-atmospheric interceptor capabilities, the [TWISTER](#) project seeks to bolster EU capacity to detect, track, and counter threats. The [EU HYDEF](#) hypersonic defence interceptor project, which is funded through the EDF, is connected to the TWISTER project. The Common Hub for Governmental Imagery ([COHGI](#)) is building a portal to make it easier for EU entities and Member States to exchange sensitive government imagery at EU level. The European Military Space Surveillance Awareness Network ([EU-SSA-N](#)) is working on a military SSA capacity for the EU that is autonomous, sovereign, and compatible with the EU-SST framework programme for the defence of Member States' space assets and services. With the help of cross-cutting space functions, such as reactive access to space, in-space manoeuvrability, space resilience, and training for space military operations, the Defence of Space Assets project ([DOSA](#)) seeks to improve the EU's operational efficiency in the space domain. Finally, the EU Radio Navigation Solution ([EURAS](#)) encourages the expansion of EU military PNT capabilities and upcoming collaboration, utilising Galileo and the publicly regulated service. It should also be noted that many of the PESCO and EDF projects are connected. For instance, EU HYDEF is linked to TWISTER, NAUCRATES to EU-SSA-N, and Navguard to EURAS. According to Fiott this [demonstrates](#) that the capability priorities listed in the CDP and CARD are matched with the EDF and PESCO when taken as a whole, thus benefitting from an EDF bonus.<sup>1</sup>

To strengthen Europe's scientific edge and support its industrial base, in February 2021 the Commission [unveiled](#) an action plan on synergies between the civil, defence, and space industries. The action plan was created with the knowledge that, for the first time, EU funding offers opportunities to support European innovation by examining and utilising the disruptive potential of technologies at the intersection of civil, military, and space applications, such as cyber, quantum, and artificial intelligence. Two flagship projects within the action plan relate to space. The first is space-based secure connectivity (IRIS<sup>2</sup>), which is expected to make a quantum encryption-based robust connection system and high-speed connectivity available to all of Europe authorities for their secure governmental communication services. The EU's 2023-2027 security connectivity [programme](#) was adopted in March 2023. The programme outlines objectives for the EU's deployment of the [IRIS<sup>2</sup>](#) (Infrastructure for Resilience, Interconnectivity, and Security by Satellite) satellite constellation. By 2027, IRIS<sup>2</sup> will offer extremely quick (low latency) and secure communication services. The second pilot project relates to space traffic management (STM), necessary to ensure autonomous access to space while preventing potential collisions potentially caused by the proliferation of satellites and space debris.

A [joint communication](#) on an EU approach to space traffic management was adopted in February 2022 and an STM pilot project [completed](#) in March 2022, which offered a thorough analysis of the current and new legislative and voluntary frameworks and practices, evaluated their efficacy, and determined their applicability. It is important to [emphasise](#) that space and defence capabilities are inherently dual use in nature. As such, these projects will certainly benefit a number of civil and security sectors, including maritime surveillance, telecommunications and air traffic management. It will however also benefit security of supply in the space sector. The development of EU space and defence can greatly profit from the EU's dual-use strategies and projects. This also results in much greater [available funding](#) from existing programmes, such as [IRIS<sup>2</sup>](#) and [Horizon Europe](#), plus funding from the EIB (which currently funds only dual-use and not solely defence projects), in addition to purely defence-related financing vehicles such as the EDF. Furthermore, a lot of [innovation](#) in the space field is driven by the private sector nowadays. Therefore, funding initiatives, such as CASSINI (as noted above), are of particular relevance when it comes to dual-use applications.



Fiott [notes](#) that it will be a major task for PESCO to ensure that the upcoming wave of PESCO projects can strengthen the credibility of EU efforts in space and defence. First, there is a need to define the connections between PESCO projects more clearly, particularly where they can improve the EU's capacity to engage in space security and defence. Second, the EU must determine which areas of space technology will be vital in the future and then utilise those areas within the framework of the EDF and PESCO. Fiott argues, that in order for the EU to be able to invest in cutting-edge space technologies, a 'substantial boost' to the EU space programme and EDF will be necessary in the next MFF. In June 2023, the Commission [proposed](#) the creation of a new 'strategic technologies for Europe platform' ([STEP](#)) with the potential to generate €160 billion in investment. As part of this, the Commission suggests allocating an additional €10 billion to targeted programmes, such as €5 billion for the Innovation Fund, and €1.5 billion for the EDF. This should increase investment in the development and manufacturing of vital digital and deep tech, also benefiting the space sector. Fiott calls for a move towards a genuine partnership between military, civilian and industry actors in order to ensure that the EU sits 'on the technological frontier of space' (referring to space domain awareness efforts).

Technical [challenges](#) also abound in implementing the strategies goals. There are many restrictions on the conversion to dual-use assets, especially in Earth observation (Copernicus). The maximum resolution of 10 metres and the image refresh rate, which occurs at intervals of several days, are both insufficient for defence application needs. This amounts to a technical failure on the part of EU space assets to meet defence requirements. National sensitivities can also interfere. The European Space Policy Institute ([EPSI](#)) stresses the need to ensure 'scale, availability and flexibility of resources', suggesting that the EU must make funding more flexible to adapt to the new scale and pace of the security environment. The EPSI also argues that a specific EU funding line for space security and defence in the sphere of innovation, capability development and operational application is needed.

## Partnering for responsible behaviour in outer space

Under the new [strategy](#) the EU is set to increase its engagement in international forums and advance the norms, rules, and principles of responsible behaviour in space. The strategy calls for the establishment of dialogues on space security with third countries, in particular with the US and other like-minded nations. Cooperation between the EU and the North Atlantic Treaty Organization (NATO) should also be enhanced. The strategy also calls for increased collaboration with the UN to advance responsible behaviour and a shared understanding of space security.

## EU-NATO space cooperation

The EU space strategy for security and defence accentuates the importance of EU-NATO cooperation in the area of space security. NATO acknowledged space as a new operational domain in 2019. In 2022, it put forward its [first space policy](#). NATO's [2022 Strategic Concept](#) underlines its efforts to maintain 'secure use of and unfettered access to space and cyberspace ... [which are] ... key to effective deterrence and defence'. It also calls for the enhancement of 'resilience of the space and cyber capabilities upon which we depend for our collective defence and security'. The Strategic Compass lays out specific goals for the EU-NATO strategic partnership, including space as a new area of cooperation. The EU and NATO confirmed their commitment to [broaden](#) and deepen their collaboration on space in the [third joint declaration](#) on EU-NATO cooperation of 10 January 2023. This commitment is based on the shared values that underpin the strategic alliance. With the [creation](#) of the EU-NATO task force on resilience of critical infrastructure on 16 March 2023 – one of whose four areas of focus is space – the EU and NATO increased their cooperation. The task force's final assessment [report](#) finds that the development of counter-space capabilities by strategic rivals and potential adversaries poses a threat to NATO's and the EU's access to space and freedom of operation, with the potential to disrupt critical infrastructure. The report's recommendations include 'strengthening the structured dialogue on resilience...', and expanding existing staff talks on ...

space'. The June 2023 eighth progress [report](#) on EU-NATO cooperation also referred to regular EU-NATO consultation on space, including political dialogue and discussion of industry matters.

## EU-US space cooperation

The EU space strategy for security and defence underlines the importance of the EU-US partnership in the area of space defence, which is supposed to be deepened. The US and EU have had a space security dialogue based on strong cooperation beyond civilian areas since 2009. The 12th EU-US space [dialogue](#) took place in Brussels in June 2023. Topics of discussion included vital cooperation on GNSS (global navigation satellite systems), Earth observation and its uses, space situational awareness and spaceflight safety. Space security, in particular space cybersecurity and multilateral involvement, received special attention during the dialogue this year in light of the EU's new space strategy for security and defence. The space dialogue offered a chance for a bilateral update on each other's policy activities, with the goal of identifying synergies and strengthening cooperation strands. The dedicated EU-US security and defence [dialogue](#), launched in 2021, can also be used for discussions on space and defence matters. EU-US cooperation on space has for instance [enabled](#) the corresponding global navigation satellite systems to transition from a state of seeming rivalry to one of increasing complementarity, interoperability, and redundancy. This was enabled by the 2011 EU-US [agreement](#) on the promotion, provision and use of [Galileo](#) and GPS satellite-based navigation systems and a 2015 Copernicus Cooperation [Arrangement](#), which facilitates data sharing between the EU and the US.

### Treaties aimed at preventing conflict in space

In the 1960s and 1970s, a number of [agreements](#) were made in an effort to prohibit countries from putting weapons in orbit. International space law was established by the 1967 [Outer Space Treaty](#), which was adopted in the framework of the UN. Since then, 110 nations have joined as parties. Other UN agreements and treaties that address different facets of space include the [Moon Agreement](#) and the [Liability Convention](#).

International cooperation on peaceful uses of space is administered by the UN Committee on the Peaceful Uses of Outer Space (COPUOS). The placement of weapons other than weapons of mass destruction in space is not prohibited by any of the treaties. Although there is currently no agreement or treaty that prohibits the placement of conventional weapons in space, multilateral discussions about the peaceful uses of space are a recurrent issue at the UN Conference on Disarmament in Geneva. The Open-Ended Working Group on reducing space threats through norms, rules and principles of responsible behaviours (OEWG) is [supported](#) by the EU and its Member States as a practical measure that contributes to the development of a shared understanding of what might be regarded as responsible and irresponsible behaviour.

The EU's space strategy for security and defence notes that the EU will continue to support multilateral efforts to reduce space threats through norms, rules and principles for responsible behaviours, including through the work of the OEWG. The strategy specifically welcomes the US commitment not to conduct ASAT missile tests (joined by Germany and France). The EU and its Member States support the relevant UN General Assembly resolution approved in October 2022.

This arrangement was for instance utilised in 2017 to [assist](#) in the response to Hurricane Harvey in Texas. The EU space security and defence strategy suggests that the shift in perception on SATNAV (from competition to partnership) could be extended to other areas, such as a space situational awareness, in order to move from a dependence on US space services to a partnership based on shared interests. EU-US space cooperation remains on the agenda at the highest political level. At the last EU-US summit in 2021, the partners [vowed](#) to enhance 'cooperation on space by building on the Galileo – GPS Agreement. This could include making progress on access to Galileo's Public Regulated Service signal, engaging in space-based Earth observation to support climate policies, for instance by monitoring CO<sub>2</sub> levels and emergency services, and exchanging on respective approaches to STM.

## US space defence strategy

In 2020, the US released its [defence space strategy](#), outlining how the US Department of Defense will develop its space capabilities in order to compete, prevent, and prevail in a complex security environment marked by great power rivalry. By [pursuing](#) three goals – maintaining space superiority, offering space support to national, joint, and combined operations, and ensuring space stability – the plan will help the DoD develop its space power. To further attain the desired conditions while addressing recognised threats, opportunities, and challenges, the Department will pursue four priority lines of effort: 1) build a comprehensive military advantage in space; 2) integrate military space power into national, joint, and combined operations; 3) shape the strategic environment; and 4) cooperate with allies, partners, industry, and other US government departments and agencies.

On EU-US and EU-NATO relations, the European Space Policy Institute [notes](#) that the EU position with respect to the US and NATO should be decided upon and represented in international space forums 'either on a national basis or through an established coordination mechanism, or any other relevant means'. In addition, the EU should take stock of NATO's renewed vitality in the wake of the outbreak of the Ukraine War and, in particular, make sure that its strategy is consistent with NATO's space policy. Experts argue that the current [deepening](#) of cooperation in the sphere of defence and space with the US and NATO is unprecedented. However, the declared goal of 'deepening cooperation in space security with the US' raises questions about a potential dependence on the US. The focus of the strategy is to create strategic autonomy. It is therefore important to carefully assess the extent to which cooperation with the US could lead to dependence on the US in terms of space security issues, because this could, at least theoretically, [contradict](#) the EU's desire to achieve strategic autonomy. Fiott [notes](#) that, if the EU falls short on its investments and is unable to protect its space-based assets, then this will affect its ability to 'support the multilateral rules-based order', as well as its overall credibility. He also emphasises the importance of making diplomatic efforts on space, engaging with competitors and partners, and continuing to develop close space partnerships with like-minded actors.

## European Space Agency

The [European Space Agency](#) (ESA) was founded as an intergovernmental international organisation in 1975, with its headquarters in Paris. The ESA's membership corresponds only partially with that of the EU. Three of its 22 members (the UK, Switzerland, and Norway) are not EU members, whereas the other 19 are. Although the ESA and the EU are independent organisations, they [collaborate](#) to achieve shared goals. About 20 % of the funds administered by ESA in recent years have come from the EU budget through implementation of the EU flagship programmes Galileo and Copernicus and the EU's research and development programme, Horizon 2020. A framework agreement that became effective in May 2004 provides the legal framework for EU/ESA cooperation. Cooperation is centred on joint institutions, such as the [Space Council](#), which includes officials from the ESA and the European Commission, a joint secretariat, and a high-level space policy group.

In light of the worldwide events that are posing challenges to the European space sector, the two organisations have been working to strengthen their cooperation in recent years. According to one [expert](#), the above-mentioned asymmetry between the ESA and EU membership – more specifically, the participation of States not party to the EU in the former – has raised some issues within EU-ESA cooperation when sensitive information for the core interests of the EU or Member States has had to be dealt with. The European Space Policy Institute recommends [deepening](#) EU relations with the ESA. For instance, the EU and the ESA could work together to promote innovation for the execution of security missions on Earth by utilising ESA initiatives, such as its 'Civil security from space' programme and the 'Rapid and resilient crisis response' accelerator, as well as other initiatives with potential security applications. The ESA's research and development initiatives would in fact benefit the EU's attempts to build its capabilities.

## European Parliament and Council positions

In its own-initiative [report](#) on 'the Strategic Compass and EU space-based defence capabilities' of 7 November 2023, the Committee on Foreign Affairs (AFET) welcomes the 'the findings and high

level of ambition in the recommendations proposed in the EU space strategy in the area of security and defence, which lives up to the high expectations of European players in the space sector'. It welcomes the proposal to draw up a classified yearly space threat assessment, and lauds the Commission for its announcement that it will propose space legislation for the EU. In light of the escalating threats in space, the EU and its Member States must improve their capacity to identify, categorise and attribute threats. AFET MEPs call for more substantive action to be taken at EU level regarding solidarity mechanisms, and call for more work to make the mutual assistance clause (Article 42(7) TEU) ready for use. Members of the Committee stress that, in order to develop space capabilities, the resources allocated to space in the next MFF must be increased. The Committee calls on the EU and its Member States to support multilateral solutions reached within the UN framework in the area of space governance. AFET notes the importance of increasing cooperation with strategic partners – especially the US – while ensuring the EU's strategic autonomy and 'remaining vigilant to the risk that it may seek to steer or dictate outlooks, standards and rules that the Member States have not helped to shape'. AFET MEPs call for deepened cooperation between the EU and NATO in areas of mutual interest. They meanwhile emphasise that cooperation with the ESA must take place within a framework that safeguards the EU's core interests and that highlights the ESA's role as a technical agency contributing to the implementation of the EU space programme.

The Council adopted [conclusions](#) on a 'fair and sustainable use of space' on 23 May 2023 and [conclusions](#) on space traffic management and the Copernicus programme on 10 June 2022. Most recently, on 14 November 2023, it adopted [conclusions](#) on the EU space strategy for security and defence. It welcomed the new strategy, supported its main points and confirmed the EU's commitment to address challenges through international cooperation, including through new space security dialogues. It also proposed actions such as increasing the EU's understanding of space threats by enhancing military and civilian intelligence services in the area of space security.

## MAIN REFERENCES

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## ENDNOTE

- <sup>i</sup> Special [incentives](#) have been added to the EDF Regulation with the intention of achieving EDF goals and fostering collaboration in the defence sector. Initiatives created within the framework of permanent structured cooperation (PESCO) are eligible for a higher EDF financing rate (+10 %).

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