

Pădureanu, Mihaela-Adriana

Working Paper

Regulating the space and the future of the European space policy: European and Romanian contributions

EIR Working Papers Series, No. 45

Provided in Cooperation with:

European Institute of Romania, Bucharest

Suggested Citation: Pădureanu, Mihaela-Adriana (2022) : Regulating the space and the future of the European space policy: European and Romanian contributions, EIR Working Papers Series, No. 45, European Institute of Romania, Bucharest

This Version is available at:

<https://hdl.handle.net/10419/281082>

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Regulating the Space and the Future of the European Space Policy. European and Romanian Contributions

Mihaela-Adriana PĂDUREANU

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Author:

Mihaela-Adriana Pădureanu

**Bucharest, December 2022
Working Paper no. 45**

European Institute of Romania

7-9, Regina Elisabeta Blvd., Bucharest, Romania

Telephone: (4021) 314 26 96; Fax: (4021) 314 26 66

E-mail: ier@ier.gov.ro; Website: www.ier.gov.ro

ISSN online: 1841 - 4281

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Abstract

In this working paper we present and discuss the main directions in the development of the outer space policy with a special focus on the relation between the European countries. The strategic importance of the outer space has been acknowledged during the Cold War and has stayed that way ever since. At the same time, as the progress in the economic area has required more advanced and efficient tools for communication and transportation, the technological development of the outer space instruments had to offer solutions and innovation for answering the need of the commercial sector. The opening of the space sector to other (non)state actors has accelerated in the last years. In this analysis we focused on the European approach to this domain and to the way in which the European Union has started and developed its role in this sector. The paper offers a few policy recommendations for the national and European levels of action aiming to highlight the relevance of this activity and to straighten the coherence of a common approach in the outer space.

Keywords: Space, european space policy, rules, United Nations

Biography: Mihaela-Adriana Pădureanu is currently an expert at the European Studies Unit, the European Institute of Romania. She worked as a researcher at SNSPA's Centre for East European and Asian Studies. She holds a PhD in Political Science and her research interests include the history and evolution of international relations, theories of international relations, foreign policy analysis and security studies.

Contact: mihaela.padureanu@ier.gov.ro.

Introduction: Why space is important for policymakers and societies?

In this paper, we discuss the evolution of the European Union (EU) space policy and some of its major implications for the future of the EU on the world stage. The applicability of space products is far-reaching, in fields starting with the military and continuing with the commercial and economic sectors. The paper will begin with an introductory section where we present the argument for the topic's relevance then we discuss the European space policy and the relevant documents. We also look at how the member states are supporting the space policy and who are the front runners in this domain. The other sections of the document focus on the EU's relationship with the United States (US) and the United Nations (UN). We chose to discuss this connection because the United States has a significant position in the space sector including in terms of spending,¹ while the UN is the main organisation that regulates space activities through the United Nations Office for Outer Space Affairs (UNOOSA). The paper will also examine the EU-UN relation and the EU-US relation in this domain to see if and how they cooperate and also to identify the major directions of this policy, according to each actor's perspective.

This analysis will also assess Romania's position on this topic and provide a few useful recommendations for strengthening its role in this domain. Finally, in the last section, we present a few policy recommendations and conclusions. The paper does not endorse a technical approach to this topic; for this type of analysis the reader is advised to use specialised websites. The methodology of the paper is based on document analyses (public documents such as strategies, and communications), survey analyses and interpretation.

The topic of this paper has wide and relevant implications in today's world and we chose to talk about this topic due to the following reasons: **First**, there is the **strategic** importance of space. Space can be considered a very demanding domain, due to the costs incurred by its management, so only a handful of countries are well-equipped to be active in this area. That is why the Cold War's two superpowers were the first able to afford the costs of such activities. Afterwards, other states joined these activities (France, Italy). However, the beginning of space activities was linked with a perceived potential advantage in the defence and innovation sectors.

* The author would like to thank Ana-Maria Anghelescu and Mihai Sebe for their valuable feedback on earlier versions of this working paper.

¹ Berger, Eric. Report finds that US accounts for more than half of global space spending. Nations around the world spent \$92 billion on the "space sector" in 2021 (01.06.2022), *Ars Technica*, <https://arstechnica.com/science/2022/01/report-finds-that-us-accounts-for-more-than-half-of-global-space-spending/> (Accessed: 03.10.2022).

This potential for obtaining an advantage over other actors is still related to today's space activities. On the same note, more recently, space has been explicitly linked with ***security and defence***. Josep Borrell, High Representative of the European Union for Foreign Affairs and Security Policy, highlighted in February 2022 that congestion and debris are threatening the space infrastructure.² The Strategic Compass, published in March 2022, mentions the need for a future EU Space Strategy for security and defence while mentioning the importance of respecting the principle of peaceful use of space.³ The Compass adds outer space to other elements which need to be protected such as land, air, sea and cyberspace.

Second, there are the ***intense processes of communication and (inter)connection penetrating the world economy***. Some of our globalised economy sectors are highly dependent on satellites' activity, especially for information and telecommunications. The two reasons mentioned above, strategic position and economic activity, were blended and are visible in the conflict in Ukraine where the increased use of technology is vital for the defence against the illegal Russian invasion.⁴

Third, there is ***the commercial potential*** of this activity. According to data from 2017, the space sector in Europe "generated €8.76 billion in annual turnover and directly employed 42,664 workers across Europe."⁵ It is expected that by 2040, the value of the global space sector will reach between \$1.1 and \$2.7 trillion.⁶ From this perspective, the "new space" concept defines the increasing private involvement in space activities, including in terms of funding and an increased number of actors involved in space activities.⁷

² EEAS, 'Space and defence: protecting Europe and strengthening our capacity to act', 20.02.2022, https://www.eeas.europa.eu/eeas/space-and-defence-protecting-europe-and-strengthening-our-capacity-act_en (Accessed: 03.07.2022).

³ Council of the EU, A Strategic Compass for Security and Defence, Brussels, 21 March 2022 (OR. en) 7371/22, <https://data.consilium.europa.eu/doc/document/ST-7371-2022-INIT/en/pdf> pp. 3-12 (Accessed: 05.06.2022). See also: Fiott, Daniel (15.04.2021), 'Securing the Heavens. How can space support the EU's Strategic Compass?', Brief 9, EU ISS <https://www.iss.europa.eu/content/securing-heavens> (Accessed: 05.06.2022).

⁴ 'Satellite internet is a hot new commodity in Ukraine' (29.04.2022), *The Economist*, <https://www.economist.com/graphic-detail/2022/04/29/satellite-internet-is-a-hot-new-commodity-in-ukraine> (Accessed: 02.05.2022).

⁵ American Chamber of Commerce to the European Union (AmCham EU), 'EU, Space, Security and Defence Strengthening the transatlantic relationship', (2019), p. 5

⁶ American Chamber of Commerce to the European Union (AmCham EU), 'EU, Space, Security and Defence Strengthening the transatlantic relationship', (2019), p. 6.

⁷ Martin, Gary (2015). NewSpace: The Emerging Commercial Space Industry NASA Ames Research Center, NASA <https://ntrs.nasa.gov/api/citations/20150023562/downloads/20150023562.pdf> (Accessed: 03.05.2022). See also: SIPRI (2022), The 'NewSpace' Industry: A Challenge for Missile Non-proliferation and Export Controls? (video). YouTube https://www.youtube.com/watch?v=M6bP_kXv974 (Accessed: 10.10.2022).

In the last 60 years, space has been one of the high-end fields for European cooperation. The topic has evolved from a curious and rather exclusive field of interest to an ever-expanding and essential domain of intense interaction between different state and non-state actors. The exclusiveness of the sector came from the high costs demanded by most of the newly-developed industries. Only a handful of European states could afford to invest in such activities. The most representative were the United Kingdom, France and Italy. As the processes of communication and exchange of goods and services have intensified, the need for reliable technologies has increased in the EU countries.

The beginning of the EU's Space Policy and the role of the member states

What today is the European cooperation in the space sector started in 1964 with the efforts of two individuals: the Frenchman Pierre Auger and the Italian Edoardo Amaldi.⁸ Thus, in one of the most turbulent phases of the Cold War, after the Cuban missile crisis, the first steps for a deepened European cooperation in the fields of science and technology began. The same year, two international treaties, signed in 1962, entered into force, thus establishing thematic entities – the European Launcher Development Organisation (ELDO) and the European Space Research Organisation (ESRO).⁹ In 1975 the two organisations merged and became the European Space Agency (ESA).

Every decade of ESA's existence can be summarised using different keywords. In the '70s the interest in telecommunication, aeronautical communication and meteorology became more relevant for the work of ESRO than the scientific research and the first steps for international cooperation with other actors (NASA) were decided.¹⁰ In 1980, ESA Convention came into force. The '80s provided concrete results to the decisions taken in the previous decade: Arianespace became the first commercial space transport company (it was owned mainly by France's space agency and all the European space companies are shareholders),

⁸ ESA, '1964–2014: fifty years of European cooperation in space' (17.01.2014), https://www.esa.int/About_Us/ESA_history/1964_2014_fifty_years_of_European_cooperation_in_space (Accessed: 02.05.2022).

⁹ ESA, *ESRO and ELDO Conventions come into force*, https://esamultimedia.esa.int/multimedia/bReWUt50Y24new/multimedia/1964_1.jpg (Accessed: 02.05.2022). Inventing Europe (n.d.), *ESRO and ELDO: science vs. technology*, <http://www.inventingeurope.eu/story/esro-and-eldo-science-vs-technology> (Accessed: 02.05.2022). ESA, *European Space Conference Approves Spacelab and Ariane* https://esamultimedia.esa.int/multimedia/bReWUt50Y24new/multimedia/1972_1.jpg (Accessed: 02.05.2022).

¹⁰ ESA, *ESRO Council Agrees 'First Package Deal'*, https://esamultimedia.esa.int/multimedia/bReWUt50Y24new/multimedia/1971_1.jpg (Accessed: 02.05.2022).

Marecs-A was the first European maritime communications satellite, while during the same decade the first ESA astronaut flew into space and the launcher Ariane 4 began launching communications and Earth observation satellites, but also satellites for scientific research.¹¹

In the '90s the innovative launching initiatives continued with ESA's first Earth-observing satellite and the first ESA's mission to Saturn with the Cassini-Huygens spacecraft – a joint ESA, NASA and the Italian space agency (Agenzia Spaziale Italiana – ASI), initiative.¹² Another important moment was in 1998 when the European countries decided to bring together their astronaut teams with ESA's team, and so a single European Astronaut Corps has been created (the process ended in 2002). Additionally, the most important science satellite created in Europe to date, XMM-Newton was launched in 1999.¹³ In the last two decades, the efforts in these areas have accelerated.

Throughout the European space cooperation, **France** can be considered the European country with the strongest position in this sector. In 1970 it launched its first satellite – the first country to do so after the two superpowers, the US and USSR.¹⁴

Today, ESA has 22 member states: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom.¹⁵ As we can see there is no full overlap between the EU member states and ESA members: some states are members of the ESA, but they are not EU members, or they are EU members, but not ESA members (e.g. Slovakia, Bulgaria and Cyprus are European cooperating states).

¹¹ ESA, *Arianespace Becomes First Commercial Space Transport Company*, https://esamultimedia.esa.int/multimedia/bReWUt50Y24new/multimedia/1980_1.jpg (Accessed: 02.05.2022). ESA, *Ariane 4*, https://www.esa.int/Enabling_Support/Space_Transportation/Ariane_42 (Accessed: 02.05.2022).

¹² ESA, *Launch of ERS-1 Remote-Sensing Satellite*, https://esamultimedia.esa.int/multimedia/bReWUt50Y24new/multimedia/1991_1.jpg; ESA, *Cassini-Huygens overview* https://www.esa.int/Science_Exploration/Space_Science/Cassini-Huygens_overview (Accessed: 02.05.2022).

¹³ ESA, *European Astronaut Corps Created*, https://esamultimedia.esa.int/multimedia/bReWUt50Y24new/multimedia/1998_1.jpg (Accessed: 02.05.2022). ESA, *First Operational Ariane 5 Flight Carrying XMM-Satellite*, https://esamultimedia.esa.int/multimedia/bReWUt50Y24new/multimedia/1999_1.jpg (Accessed: 02.05.2022).

¹⁴ ESA, *Diamant B launch, Kourou, 1970* (22.04.2004), https://www.esa.int/ESA_Multimedia/Images/2009/11/Diamant_B_launch_Kourou_1970 (Accessed: 02.05.2022).

¹⁵ ESA, *Member States & Cooperating States*, https://www.esa.int/About_Us/Corporate_news/Member_States_Cooperating_States (Accessed: 02.05.2022). Romania has been a ESA member since 22 December 2011 (Accessed: 02.05.2022).

This brief history of the EU member countries' cooperation in space shows us the commitment of the EU member states (and institutions) to a more consolidated role of the EU in outer space.

The institutional development of the space policy

For a clearer understanding of the content of this paper, we propose a working definition for the term *space policy*. The definition we will use was formulated by Frans G. von der Dunk:

*“‘Space policy’ refers to a slightly abstract and largely strategic formulation of overarching goals and objects, which may at some point be given shape by specific law or regulation – but are equally often given shape by non-legal, essentially political and policy instruments”, while respecting the principles of subsidiarity and proportionality.*¹⁶

Thus, besides what is usually found in the structure of each public policy goals and tools for achieving and evaluating those results, the EU's space policy adds non-legal instruments and the principles of subsidiarity and proportionality.

However, the first Treaty-related mention of outer space as an area where the European Communities could have competencies came in the '80s, with the European Single Act. The most important change in the institutional framework of the Communities since their initiation, the European Single Act encouraged and allowed the financing of research and development, which included space as well.¹⁷ The European-level initiative was followed in 1994 by the Satellite Directive with the Commission as an active actor in this field and the decision to become involved in the Global Navigation Satellite System, which would form the base of the future Galileo system.¹⁸ Frans von der Dunk remarks that these actions were taken as, at the beginning of the '90s, a Green Paper called for increased liberalisation and privatisation in the

¹⁶ von der Dunk, Frans G., 'The EU Space Competence as per the Treaty of Lisbon: Sea Change or Empty Shell?' (2011), *Space, Cyber, and Telecommunications Law Program Faculty Publications*, 66, p. 387, <https://digitalcommons.unl.edu/spacelaw/66> (Accessed: 02.05.2022).

¹⁷ von der Dunk, Frans G., 'The EU Space Competence as per the Treaty of Lisbon: Sea Change or Empty Shell?' (2011), *Space, Cyber, and Telecommunications Law Program Faculty Publications*, 66, p. 383, <https://digitalcommons.unl.edu/spacelaw/66> (Accessed: 02.05.2022).

¹⁸ von der Dunk, Frans G., 'The EU Space Competence as per the Treaty of Lisbon: Sea Change or Empty Shell?' (2011), *Space, Cyber, and Telecommunications Law Program Faculty Publications*, 66, p. 383, <https://digitalcommons.unl.edu/spacelaw/66>, p. 384 (Accessed: 02.05.2022).

telecommunications sector.¹⁹ This shows that in the early '90s, after the end of the Cold War, the soon-to-be very dynamic economic landscape needed more general principles for this area on the European part, to provide clearer guidelines for the actors, public or private, active in this sector.

In 1998, the Council made the first move towards deepening the cooperation between the EU and ESA. The Council Resolution of 22 June 1998 on the reinforcement of the synergy between the European Space Agency and the European Community called on the European Commission to act on:

*“the complementarity between the Community and ESA respect of their respective competences, so as to enhance the efficiency of government investments in space systems and technologies for the benefit of the users, industry and related European policies; (...) while avoiding unnecessary duplication”.*²⁰

This resolution, adopted during the UK Presidency, became the rock on which the following institutional contacts developed. In 1999 another Council resolution asked the Commission to prepare, together with ESA “a comprehensive document on a coherent European strategy for space”.²¹ The result of this initiative was delivered a year later, in 2000 – the ***European Strategy for Space*** was supported by ESA and by the 2000/C 371/02 Council resolution.²² The Councils of EU and ESA met at the same time to adopt the document and supported the creation of a high-level joint Task Force which brought together the ESA Executive and the European Commission.²³

¹⁹ von der Dunk, Frans G., ‘The EU Space Competence as per the Treaty of Lisbon: Sea Change or Empty Shell?’ (2011), *Space, Cyber, and Telecommunications Law Program Faculty Publications*, 66, p. 383, <https://digitalcommons.unl.edu/spacelaw/66>, p. 384 (Accessed: 02.05.2022).

²⁰ The Council of the European Union, Council Resolution of 22 June 1998 on the reinforcement of the synergy between the European Space Agency and the European Community Official Journal C 224 , 17/07/1998 P. 0001 – 0002: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.1998.224.01.0001.01.ENG (Accessed: 01.07.2022).

²¹ The Council of the European Union, Council resolution of 2 December 1999 on developing a coherent European space strategy OJ C 375, 24.12.1999 (Accessed: 01.07.2022).

²² The Council of the European Union, Council Resolution of 16 November 2000 on a European space strategy (2000/C 371/02), https://www.copernicus.eu/sites/default/files/2018-10/2000c_371_2_space_strategy.pdf (Accessed: 01.07.2022).

²³ ESA, *ESA and the European Union adopt a common strategy for space*, 16.11.2000 https://www.esa.int/About_Us/Business_with_ESA/ESA_and_the_European_Union_adopt_a_common_strategy_for_space (Accessed: 01.07.2022).

The document highlighted the strategic importance of space and the need to have a coherent approach towards this domain. However, the strategic dimension was not the only guiding principle behind this approach towards space. The commercial needs and the search for concrete results that would improve the lives of ordinary citizens were also taken into account in those early days of cooperation.²⁴

As we can see, these institutional steps for cooperation took place at a time of a very fast-growing age of the World Wide Web. In 2003 the Commission presented the Green Paper on European Space Policy (hereafter ESP). As we have seen in the first pages of this paper, Italy has been one of the most active European players in outer space. It is therefore understandable why in November of the same year, under the Italian presidency of the Council, the ESA/EC Framework Agreement (FA)²⁵ was endorsed. The FA aimed to deepen the cooperation between ESA and the European Commission and to prepare the ESP. Frans von der Dunk considers this document to be similar to a treaty for the two signatories, the EU and ESA, which allowed the EU institutions (including ESA's director general) to initiate actions in the area of space.²⁶ It was under the same Italian presidency that the White Paper on Space²⁷ was adopted. The document underlined the relevance of different actors for the ESP "(ESA), EU and ESA Member States with their national space agencies, research centres, and industry", which comes to show that this process of multidimensional consultation aims to ensure a strong cohesion and support for this policy. Also, the document mentions the need to apply the ESP within a multi-annual European Space Programme and its potential to contribute to the "Union's Common Foreign and Security Policy and its European Security and Defence Policy."

²⁴ Telecommunications were one of UK's priorities during its presidency: <https://web.archive.org/web/20030802210800/http://presid.fco.gov.uk/workprog/> (Accessed: 01.07.2022). Also the Finish Presidency of 1999 mentioned space as a priority in its Programme: <https://web.archive.org/web/20080225225239/http://presidency.finland.fi/agenda.html> (Accessed: 01.07.2022).

²⁵ Framework Agreement between the European Community and the European Space Agency, Official Journal L 261, 06/08/2004 p. 0064–0068, [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22004A0806\(03\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22004A0806(03)&from=EN) (Accessed: 01.07.2022).

²⁶ von der Dunk, Frans G., 'The EU Space Competence as per the Treaty of Lisbon: Sea Change or Empty Shell?' (2011), *Space, Cyber, and Telecommunications Law Program Faculty Publications*, 66, p. 383, <https://digitalcommons.unl.edu/spacelaw/66>, p. 385 (Accessed: 01.07.2022)..

²⁷ White paper - Space: a new European frontier for an expanding Union - An action plan for implementing the European Space policy SEC (2003) 1249, COM/2003/0673 final <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52003DC0673> (Accessed: 01.07.2022).

In 2004, while preparing for the ratification of the Lisbon Treaty, the first European Space Council was held in Brussels with the participation of the 27 ministers of member states and the European Space Agency (ESA) member states.²⁸

The European Space Policy²⁹ was adopted in May 2007 by the fourth Space Council. We will highlight a few lines from the document that we consider relevant to the topic of this paper. First is the **strategic importance of space** for the “independence, security and prosperity of Europe and its role in the world.”³⁰ Second is **the role of space for the Common Foreign and Security Policy and climate change**,³¹ the need to develop a “commercially sustainable global civil navigation satellite”³² and introduces the European Defence Agency for optimising synergies between all aspects of the European Space Policy.³³ The third is **the reference to the United Nations’ actions in this sector, especially the Outer Space Treaty** and which are taken into account by the EU document. These general principles highlight that the subject is relevant for many layers of the EU’s economy and that these types of actions need to be coordinated at the European level, as much as possible with the international efforts in this sector.

Probably the most significant evolution for the ESP in terms of normative guidelines and a legal framework came with the entry into force of the Lisbon Treaty. Article 2c mentions the classification of possible actions in this sector shared between the member states and the Union:

“In the areas of research, technological development and space, the Union shall have competence to carry out activities, in particular to define and

²⁸ ESA, *First ever 'Space Council' paves the way for a European space programme* 25/11/2004 https://www.esa.int/About_Us/Corporate_news/First_ever_Space_Council_paves_the_way_for_a_European_space_programme (Accessed: 01.07.2022).

²⁹ Wilson, Andrew (ed.), *Resolution on the European Space Policy* ESA Director General’s Proposal for the European Space Policy ESA Communications <https://www.esa.int/esapub/br/br269/br269.pdf> (Accessed: 01.07.2022).

³⁰ Council of the European Union, Brussels, 25 May 2007, 10037/07, p. 3, <https://data.consilium.europa.eu/doc/document/ST-10037-2007-INIT/en/pdf> (Accessed: 01.07.2022).

³¹ Council of the European Union, Brussels, 25 May 2007, 10037/07, p. 3, <https://data.consilium.europa.eu/doc/document/ST-10037-2007-INIT/en/pdf> (Accessed: 01.07.2022).

³² Council of the European Union, Brussels, 25 May 2007, 10037/07, p. 5, <https://data.consilium.europa.eu/doc/document/ST-10037-2007-INIT/en/pdf> (Accessed: 01.07.2022).

³³ Council of the European Union, Brussels, 25 May 2007, 10037/07, p. 6, <https://data.consilium.europa.eu/doc/document/ST-10037-2007-INIT/en/pdf> (Accessed: 01.07.2022).

implement programmes; however, the exercise of that competence shall not result in Member States being prevented from exercising theirs.”³⁴

In the same Treaty, the European Parliament is introduced as an actor involved in the process of regulating the space:

“Article 172a

1. To promote scientific and technical progress, industrial competitiveness and the implementation of its policies, the Union shall draw up a European space policy. To this end, it may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of space.

2. To contribute to attaining the objectives referred to in paragraph 1, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall establish the necessary measures, which may take the form of a European space programme, excluding any harmonisation of the laws and regulations of the Member States.”³⁵

Also, space became one of the terms of reference for the EU Competitiveness Council, supported by the Space Working Party, to which ESA can be invited as an observer.³⁶ On a conceptual level, Jay W. Morgan argues that EU interests and strategy in space are shaped by its meta role identities as a civilian power and “global player” and that the Commission uses space policy as a lever to drive European integration in other areas.³⁷

ESA’s partners are national bodies responsible for space of its member states, the European Union, Eumetsat,³⁸ the European Defence Agency – EDA and ESA’s international

³⁴ Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon, 13 December 2007, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A12007L%2FTXT> (Accessed: 01.07.2022).

³⁵ Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon, 13 December 2007, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A12007L%2FTXT> (Accessed: 01.07.2022).

³⁶ ESA, *European milestones*, https://www.esa.int/About_Us/Corporate_news/European_milestones (Accessed: 01.07.2022).

³⁷ Morgan Jay W. (2021) ‘Europeanizing Space: How The European Commission Formulates And Instrumentalizes Eu Identity And Interests In Earth Orbit, p. 3.

³⁸ European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) is an intergovernmental organisation based in Darmstadt, Germany, currently with 30 Member States: <https://www.eumetsat.int/about-us/who-we-are> (Accessed: 01.07.2022).

partners.³⁹ After the Lisbon Treaty, the EC launched a Communication, *Towards a Space Strategy for the European Union That Benefits its Citizens*.⁴⁰ The document refers to other official documents, such as “*Europe 2020. A strategy for smart, sustainable and inclusive growth*”, the Commissions’s Communication on Industrial Policy, and and the conclusions of the Competitiveness Council from December 2010, mentioning space policy as part of **the industrial policy flagship initiative** and calling on the delivery of the Galileo and Global Monitoring for Environment and Security (GMES).

The GMES programme, launched in 1999, has been initiated under the supervision of the Austrian and German Presidencies,⁴¹ and is a joint initiative of the European Commission, its member states, the European Space Agency (ESA) and the European Environment Agency (EEA).⁴² GMES aims to provide accurate information about the effects of climate change and to help protect civil security,⁴³ addressing also other multilateral issues seen as a matter of credibility for the EU.⁴⁴ In the GMES frame, security includes “humanitarian aid, peacekeeping tasks, border surveillance and response to crises.”⁴⁵ In 2004, the programme initiated a space-based observation mission under the name of the Sentinel family of satellites, and in 2005 GMES became the EU’s main contribution to the Global Earth Observation System of Systems (GEOSS). A few years later, in 2012, GMES was renamed Copernicus.⁴⁶

³⁹ ESA, *A European vision* https://www.esa.int/About_Us/Corporate_news/A_European_vision (Accessed: 01.07.2022).

⁴⁰ European Commission, Brussels, 4.4.2011 COM(2011) 152 final Communication From the Commission to the Council, The European Parliament, The European Economic and Social Committee and the Committee of the Regions *Towards a Space Strategy for the European Union that Benefits its Citizens* <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0152&from=EN> (Accessed: 01.07.2022).

⁴¹ Council of the European Union, Brussels, 25 May 2007, 10037/07, p. 5, <https://data.consilium.europa.eu/doc/document/ST-10037-2007-INIT/en/pdf> (Accessed: 01.07.2022).

⁴² ESA, *Global Monitoring for Environment and Security (GMES)*, Ministerial Council 2012, https://www.esa.int/About_Us/Ministerial_Council_2012/Global_Monitoring_for_Environment_and_Security_GMES (Accessed: 01.07.2022).

⁴³ Hopkins, Huw. ‘The Status of ESA’s GMES Space Component Programme’, p. 1, https://www.nottingham.ac.uk/ecriuk/presentations/pdf_files/P3/Hopkins.pdf (Accessed: 02.07.2022). See also: Commission Of The European Communities, Brussels, 23.10.2001, COM(2001) 609 final. Communication From The Commission To The Council And The European Parliament, *Global Monitoring for Environment and Security (GMES) Outline GMES EC Action Plan (Initial Period: 2001 – 2003)*, p. 2 <https://www.copernicus.eu/sites/default/files/2018-10/COM-2001-609.pdf> (Accessed: 02.07.2022).

⁴⁴ Booz & Company (2011), *Cost-Benefit Analysis for GMES*, Final Version II Prepared for: European Commission Directorate – Enterprise and Industry, p. 24 https://www.copernicus.eu/sites/default/files/2018-10/ec_gmes_cba_final_en.pdf (Accessed: 03.07.2022).

⁴⁵ Copernicus History Overview, p. 1. <https://defence-industry-space.ec.europa.eu/system/files/2022-03/Copernicus%20History%20EN.pdf> (Accessed: 01.07.2022).

⁴⁶ Copernicus History Overview, p. 1. <https://defence-industry-space.ec.europa.eu/system/files/2022-03/Copernicus%20History%20EN.pdf> (Accessed: 01.07.2022).

The dimensions of the European Space Policy (ESP)

Since its beginning, ESA has been considered a tool complementary to other EU policies, such as competition and industrial policies, where there is a different degree of responsibility transferred to the supranational institutions, all aiming to better prepare the European economy and society to respond to different challenges, including the digital transformation and climate changes that imply better management of the natural and human resources.

The European Space Policy is implemented through three flagship initiatives: **COPERNICUS** (the European Union's Earth Observation Programme), **GALILEO** and **EGNOS** (the European Geostationary Navigation Overlay Service). In February 2022, the European Commission proposed two new tools: the **EU space-based secure connectivity system and Space Traffic Management (STM)** aiming to ensure the efficiency and security of space technology.⁴⁷ They follow the directions from *A New Industrial Strategy for Europe*⁴⁸ and the *Action Plan on synergies between civil, defence and space industries*.⁴⁹

Copernicus is the most well-known Earth Observation programme in the world, which was discussed for the first time in 1998 with the signing by a group of experts of the Baveno Manifesto, in Italy. In 2012, in a landmark decision, the EU adopted a Regulation which gave the Copernicus programme a unique trait: it allowed the full, free and open data policy.⁵⁰ Today, there are eight Copernicus Sentinel satellites in orbit, and six by contributing missions, in situ sensors and numerical models:

- The Copernicus Atmosphere Monitoring Service;
- The Copernicus Climate Change Service;
- The Copernicus Marine Environment Monitoring Service;
- The Emergency Management Service;

⁴⁷ European Commission, Press release 15 February 2022, 'Space: EU initiates a satellite-based connectivity system and boosts action on management of space traffic for a more digital and resilient Europe' https://ec.europa.eu/commission/presscorner/detail/en/IP_22_921 (Accessed: 02.07.2022).

⁴⁸ European Commission, Brussels, 10.3.2020 COM(2020) 102 final Communication From The Commission A New Industrial Strategy for Europe <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0102> (Accessed: 02.07.2022).

⁴⁹ European Commission, Communication From The Commission To The European Parliament, The European Council, The Council, The European Economic And Social Committee And The Committee Of The Regions https://ec.europa.eu/info/sites/default/files/action_plan_on_synergies_en_1.pdf (Accessed: 02.07.2022).

⁵⁰ ESA, 'Free access to Copernicus Sentinel satellite data' (15.11.2013), <https://sentinels.copernicus.eu/web/sentinel/-/free-access-to-copernicus-sentinel-satellite-data/1.1> (Accessed: 01.07.2022).

- The Copernicus Land Monitoring Service;
- The Security Service.⁵¹

An important step forward for the EU space policy has been the launch in 2016 of the much-delayed **Galileo** satellite navigation project. Although the project was 17 years late and cost more than 10 billion euros, the satnav system became available to users who already have a smartphone and/or navigation sets with Galileo-compatible microchips.⁵²

We can see an even more dynamic activity in the area of space policy after 2016, a truly remarkable year for the EU's activities regarding space. The EU and ESA issued a joint in which they underlined that:

*“By 2030, Europe should be able to fully benefit from its space solutions to implement its policies, to strengthen European values and security, improve knowledge and foster prosperity.”*⁵³

This significant goal stated by the EU and ESA shows that the main function of the initiative is to create the framework facilitating a better policy answer for solving the challenges posed by a very dynamic economic domain. From this perspective, more data and more digitalisation also need more efficient tools for responding to the different challenges linked to this type of economic transformation. That is why the Competitiveness Council decided in 2016 to address the need to “improving the uptake of space data from European space programmes to create growth and jobs.”⁵⁴

Also in 2016, following a Council meeting at the ministerial level in Lucerne, Switzerland, ESA's 22 member states, together with Slovenia and Canada, decided to allocate 10.3 billion euros for space activities and programmes following the vision of a United Space in Europe in the era of Space 4.0.⁵⁵ At the same meeting, four other resolutions were adopted,

⁵¹ Copernicus History Overview, p. 2. <https://defence-industry-space.ec.europa.eu/system/files/2022-03/Copernicus%20History%20EN.pdf> (Accessed: 01.07.2022).

⁵² Euractiv, ‘Europe’s own satnav, Galileo, due to go live’ (13.12.2016), <https://www.euractiv.com/section/transport/news/europes-own-satnav-galileo-due-to-go-live/> (Accessed: 01.07.2022).

⁵³ ESA, *Joint statement on shared vision and goals for the future of Europe in space by the EU and ESA* (26 October 2016), https://www.esa.int/About_Us/Corporate_news/Joint_statement_on_shared_vision_and_goals_for_the_future_of_Europe_in_space_by_the_EU_and_ESA (Accessed: 01.07.2022).

⁵⁴ Council of the EU, Competitiveness Council, 26-27 May 2016, <https://www.consilium.europa.eu/en/meetings/compet/2016/05/26-27/> (Accessed: 01.07.2022).

⁵⁵ ESA, European ministers ready ESA for a United Space in Europe in the era of Space 4.0 (02.12.2016) https://www.esa.int/About_Us/Ministerial_Council_2016/European_ministers_ready_ESA_for_a_United_Space_in_Europe_in_the_era_of_Space_4.0 (01.07.2022). Space 4.0 refers to a space where there is an increased number of actors active in the area of space coming from the governments, private sector, society and politics. In

actions which point out how important it is to deepen the cooperation. The resolutions were the following:

- Towards Space 4.0 for a United Space in Europe;
- Level of Resources for the Agency's Mandatory Activities 2017-2021;
- CSG (Guiana Space Centre) (2017-2021);
- ESA Programmes.

As we mentioned, in October of the same year, the Commission adopted the **Space Strategy for Europe**, welcomed by both the Council and the European Parliament.⁵⁶ The Strategy mentions four strategic goals for the EU space policy:

1. *Maximising the benefits of space for society and the EU economy.* One of the actions proposed by the Commission for achieving this goal is to support “standardisation measures and roadmaps, and by integrating space into future strategies addressing, for example, autonomous and connected cars, railways, aviation and unmanned aerial vehicles (drones).” This measure is very important and can bring many benefits through cost reductions between the actors involved and increased interdependence which can allow for better and improved responses to different problems.
2. *Fostering a globally competitive and innovative European space sector.* This section of the document also highlights the EU's vulnerability concerning the supply chains and seeks solutions to address this issue. Moreover, with this goal the Commission admits that space is a highly global competitive domain and that the new space involves new (state and commercial) actors in this sector. The fact that their activity attracts such a high number of parties can allow for better knowledge transfer between commercial and non-commercial actors.
3. *Reinforcing Europe's autonomy in accessing and using space in a secure and safe environment.* Through this aim, the Strategy begins to introduce more future actions that need to be taken in this area. They include the necessity to: “maintain autonomous, reliable and cost-effective access to space” and the intention to

the same time: ‘Space 4.0 is analogous to, and is intertwined with, Industry 4.0, which is considered as the unfolding fourth industrial revolution of manufacturing and services.’ See also: https://www.esa.int/About_Us/Ministerial_Council_2016/What_is_space_4.0 (Accessed: 01.07.2022).

⁵⁶ Wilson, Alex. (2021) EU Space programme. *EPRS European Parliamentary Research Service* PE 628.300 – May 2021, p. 2
[https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/628300/EPRS_BRI\(2018\)628300_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/628300/EPRS_BRI(2018)628300_EN.pdf)
(Accessed: 01.07.2022).

launch “in the next 10-15 years more than 30 satellites for its Galileo and Copernicus programmes.” The same section of the document mentions ESA, EUMETSAT and the European Defence Agency as the organisations involved in helping address the topics identified in this section.

4. *Strengthening Europe’s role as a global actor and promoting international cooperation.* This paragraph mentions the importance of promoting and respecting the principles referred to by the UN and the other multilateral frameworks.
5. *Ensuring Effective Delivery.* This last objective is more technical as it mentions the institutional actors involved in implementing, but that are also contributing to the implementation of this Strategy.⁵⁷

Aiming to consolidate and expand its position in space, the EU’s budget for 2021-2027 allocated 14.8 billion euros for the EU space programme (although the Commission initial proposal was for 16 billion). The previous budget for 2014-2020 was 12.6 billion euros, under the budget heading Single market, innovation and digital.⁵⁸

The new EU space programme, launched in 2021, led to the creation of the European Union Agency for the Space Programme (EUSPA), which was officially inaugurated on 12 May 2021.⁵⁹ EUSPA, the former European Global Navigation Satellite Systems Agency (GSA), will contribute to the implementation of the space programme which has entered into force retroactively, from 1 January 2021.⁶⁰

For the current trio of the EU Presidencies space is one of the main domains for action. The 18-month Programme of the Council (1 January 2022 – 30 June 2023) states that the trio

⁵⁷ European Commission, Brussels, Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions. Space Strategy for Europe, 26.10.2016 COM(2016) 705 final <https://ec.europa.eu/docsroom/documents/19442>, p. 2-12 (Accessed: 01.07.2022).

⁵⁸ Wilson, Alex. (2021), ‘EU Space programme’, *EPRS European Parliamentary Research Service Members’ Research Service*, PE 628.300, p. 3 [https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/628300/EPRS_BRI\(2018\)628300_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/628300/EPRS_BRI(2018)628300_EN.pdf) (Accessed: 01.07.2022).

⁵⁹ EUSPA, About EUSPA <https://www.euspa.europa.eu/about/about-euspa#history> (Accessed: 05.05.2022).

⁶⁰ Czech Presidency of the Council of the European Union, ‘The EU’s space activities are managed from the Czech Republic’, (28.07.2022), <https://czech-presidency.consilium.europa.eu/en/news/the-eu-s-space-activities-are-managed-from-the-czech-republic/> (Accessed: 01.08.2022).

aims to achieve EU autonomy and competitiveness in the space sector within 8 months and to support responsible behaviour in space, in particular within the United Nations.⁶¹

The French presidency of the EU Council represented the possibility to help formulate a space strategy for security and defence and prepare the “Secure Connectivity constellation initiative”, “a new secure communication satellite infrastructure” and “a common European position on space traffic management.”⁶² As for the Czech Presidency, as the host state of the EU Agency for the Space Programme (EUSPA), space has been an important area during its term that started 1 July 2022.⁶³ The programme of the Czech Presidency included among its priorities the aims to “strengthen Europe’s defence capabilities and cyberspace security” and to monitor “the EU space-based secure communication system” in the context of increased threats.⁶⁴ Also, the EU Space Week 2022 took place in Prague during 3-6 October 2022, marking the important place of this topic for the Czech Presidency and highlighting the essential role of “New Space”, entrepreneurship, innovation and the EU Space programme for changes that can improve the lives of the citizens.⁶⁵ Moreover, aiming to boost the security of communications, in November 2022, the Council and the European Parliament reached a provisional agreement on a regulation establishing the EU’s secure connectivity programme for the period 2023-2027. To ensure this strategic goal, the European Union will “deploy an EU satellite constellation called ‘IRIS2’ (Infrastructure for Resilience, Interconnectivity and Security by Satellite), which will enable secure communication services by 2027.”⁶⁶

The upcoming Swedish presidency of the Council of the EU has announced as one of its five priorities the speeding up of the climate transition. From this perspective, the Copernicus

⁶¹ Council of the European Union, Brussels, 10 December 2021 (OR. en) 14441/21 POLGEN 191 Taking forward the Strategic Agenda 18-month Programme of the Council (1 January 2022 - 30 June 2023) <https://presidence-francaise.consilium.europa.eu/media/15fjwokc/trio-programme.pdf> (Accessed: 02.07.2022)

⁶² French Presidency of the Council of the European Union, Recovery, Strength and a Sense of Belonging, p. 2, p. 51 https://presidence-francaise.consilium.europa.eu/media/qh4cg0qq/en_programme-pfue-v1-2.pdf (Accessed: 02.07.2022).

⁶³ EUSPA, Czech EU Presidency puts space at the centre of its security priority’ <https://www.euspa.europa.eu/newsroom/news/czech-eu-presidency-puts-space-centre-its-security-priority> (Accessed: 01.07.2022).

⁶⁴ Europe as a Task: Rethink, Rebuild, Repower, Priorities of the Czech Presidency of the Council of the European Union in 2022, p. 6 <https://czech-presidency.consilium.europa.eu/media/ddjq0zh/programme-cz-pres-english.pdf> (Accessed 10.10.2022).

⁶⁵ Copernicus, ‘EU Space Week 2022’, <https://www.copernicus.eu/en/events/events/eu-space-week-2022> (Accessed: 07.08.2022).

⁶⁶ Council of the EU, ‘Council and European Parliament agree on boosting secure communications with a new satellite system’, Press release, 17 November 2022, <https://www.consilium.europa.eu/en/press/press-releases/2022/11/17/council-and-european-parliament-agree-on-boosting-secure-communications-with-a-new-satellite-system/> (Accessed: 24.11.2022).

data can help build climate-proof cities according to the European Union Agency for the Space Programme (EUSPA), as the pressure from climate change has affected many European cities this summer.⁶⁷ Sweden is an active player in the outer space sector and has become the host of Europe's first satellite launch station.⁶⁸

The relevance and the priority given to the use of space technology, data and services have grown faster during the past two years. As bigger parts of society rely upon virtual and technological data and services for their daily activities, more refined and capable tools are needed to ensure the best possible outcome for the economic and social activities.

The EU's cooperation with the United Nations and the United States in the space domain

In this section, we will address the relationship between the EU and two other actors, one a state (the United States) and the other – an international organisation (the United Nations) to see if and how they cooperate in the space domain. As mentioned earlier, we decided to discuss the UN and not another organisation because we consider the UN to be the most relevant international actor in terms of space regulation, even if there is usually a rather difficult task to make all the states agree on some general principle, as the reader will see in the following paragraphs.

The EU's approach to space is guided by the internationally agreed perspective: the 1967 Outer Space Treaty. Because its format was first discussed and agreed upon during the Cold War, more precisely after the Cuban Missile Crisis, it has at its centre the topic of a weapon of mass destruction (WMD). As the world was living in the shadow of destruction due to nuclear weapons, the countries which agreed to the Treaty took into consideration first of all the prohibition of the usage of WMD in space. Until now, "110 states-parties, with another 89 countries that have signed it but have not yet completed ratification."⁶⁹ Among other principles, the Treaty states that:

- "the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind;

⁶⁷ EUSPA, Using Copernicus data to climate-proof cities (26.08.2022) <https://www.euspa.europa.eu/newsroom/news/using-copernicus-data-climate-proof-cities> (Accessed: 15.11.2022).

⁶⁸ The Mayour.eu, Sweden to host Europe's first satellite launch station (12.10.2021), <https://www.themayor.eu/en/a/view/sweden-to-host-europe-s-first-satellite-launch-station-9095> (Accessed: 07.08.2022).

⁶⁹ Kimball, Daryl. Rusek, Ben. *The Outer Space Treaty at a Glance*, October 2020, Armes Control Association, <https://www.armscontrol.org/factsheets/outerspace> (Accessed: 02.07.2022).

- outer space shall be free for exploration and use by all States;
- States shall be responsible for national space activities whether carried out by governmental or non-governmental entities.”⁷⁰

The so-called dual-nature of space – understood as a tool which can be used for civil or defence/security goals – makes the topic a highly sensitive one.⁷¹ These principles are reflected in the EU main documents governing the space activities, including the 2016 Space Strategy for Europe.

The EU has had close cooperation with the United Nations Office for Outer Space Affairs (UNOOSA). In 2019 they signed a joint statement which allowed them to cooperate to address the problem of space debris,⁷² one of the main challenges to the sustainability of space.⁷³ The EU has addressed the problem of debris since 2014 when the Space Surveillance and Tracking (SST) Support Framework, also known as the EU SST, was launched with Decision 541/2014/EU of the European Parliament and the Council (SST Decision).⁷⁴ The EU Space Strategy also mentions the potential harm that debris can cause in space⁷⁵. The Decision established that the Commission will work together with the SST Consortium and ESA for responding to the issues related to space surveillance:

“The Commission and the SST consortium established under this Decision, in close cooperation with ESA and other stakeholders, should continue to

⁷⁰ United Nations Office for Outer Space Affairs, Resolution Adopted by the General Assembly <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html> (Accessed: 02.07.2022).

⁷¹ EEAS, ‘Space’ (03.08.2021) https://www.eeas.europa.eu/eeas/space_en (Accessed: 02.07.2022).

⁷² United Nations Office for Outer Space Affairs (UNOOSA), UNIS/OS/510 24 May 2019, Press Release, ‘UNOOSA and ESA join forces to address the space debris challenge’ <https://www.unoosa.org/oosa/en/informationfor/media/2019-unis-os-510.html> (Accessed: 02.07.2022).

⁷³ United Nations Office for Outer Space Affairs (UNOOSA), 2021 Annual Report, Vienna, 2022, p. 17 https://www.unoosa.org/documents/pdf/annualreport/UNOOSA_Annual_Report_2021.pdf. See also: United Nations Office for Outer Space Affairs (UNOOSA), ‘UNOOSA and ESA space debris infographics and podcasts’ (10.02.2021), <https://www.unoosa.org/oosa/en/informationfor/media/unoosa-and-esa-release-infographics-and-podcasts-about-space-debris.html> (Accessed: 02.07.2022).

⁷⁴ European Union Satellite Centre, ‘Space Situational Awareness (SSA)’, <https://www.satcen.europa.eu/page/ssa> (Accessed: 02.07.2022).

⁷⁵ European Commission, Brussels, Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions. Space Strategy for Europe, 26.10.2016 COM(2016) 705 final <https://ec.europa.eu/docsroom/documents/19442>, p. 9 (Accessed: 02.07.2022)..

take the lead in technical SST dialogues with strategic partners, in accordance with their respective competences.”⁷⁶

However, it acknowledges that when necessary, the principles of subsidiarity and proportionality will be used to achieve the goals stated in the Decision:

“Since the objectives of this Decision, namely to support actions aimed at the establishment and operation of the network of sensors, the establishment of the capacity to process and analyse SST data, and the establishment and operation of SST services, cannot be sufficiently achieved by the Member States acting alone, as the provision of such services by a consortium of participating Member States would benefit the Union, notably in its role as major owner of space assets, but can rather, by reason of the scale of the Decision, be better achieved at Union level, the Union may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty of the European Union. In accordance with the principle of proportionality, as set out in that Article, this Decision does not go beyond what is necessary in order to achieve those objectives.”⁷⁷

The current SST Consortium is composed of seven EU member states represented through their national designated entities: France (National Centre for Space Studies – CNES), Germany (German Space Agency at DLR), Italy (Italian Space Agency – ASI), Poland (Polish Space Agency – POLSA), Portugal (Ministry of Defence), Romania (Romanian Space Agency – ROSA), and Spain (Centre for the Development for Industrial Technology – CDTI). Since 2016, the SST Consortium and the EU Satellite Centre (SatCen) have worked together to develop a European SST capability with the support of the European Union under different funding lines (H2020, Galileo and Copernicus programmes), and formed the SST Cooperation.⁷⁸

⁷⁶ Decision No 541/2014/EU of the European Parliament and of The Council of 16 April 2014 Establishing a Framework for Space Surveillance and Tracking Support <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32014D0541> (Accessed: 02.07.2022).

⁷⁷ Decision No 541/2014/EU of the European Parliament and of The Council of 16 April 2014 Establishing a Framework for Space Surveillance and Tracking Support <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32014D0541> (Accessed: 02.07.2022).

⁷⁸ European Union Satellite Centre, Space Situational Awareness (SSA) <https://www.satcen.europa.eu/page/ssa> (02.07.2022). See also: European Union Space Surveillance and Tracking (EU SST), ‘What is EU SST?’, <https://www.eusst.eu/> (Accessed: 02.07.2022).

The EU also cooperates with the United States in the area of outer space. The United States is by far, the most important actor in the space domain. A formal step in this direction was taken in 2005 with the EU-US summit where the opening of a dialogue on civil space cooperation was decided.⁷⁹ The main contact partners of ESA are the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and the United States Geological Survey (USGS). The US also has a National Space Strategy (the latest from 2020⁸⁰), something that the EU intends to have in the future, as already mentioned in this paper. The United States Space Priorities Framework from December 2021 mentions as the highest priority the goal of maintaining the US “leadership in space exploration and space science.”⁸¹ This priority underlines the relevance and significant role of the outer space for the United States critical infrastructure, and also aims to integrate this sector or to deepen its effects on other sector such as: “the protection of terrestrial critical infrastructure from space weather events, which can disrupt services such as electric power, telecommunications, water supply, health care, and transportation.”⁸² Thus we can see that the role of space activities tends to become more important with every decade, as the economic activity changes and implies more complex processes.

In 2015, in Washington, the EU (represented by the European Commission) and the United States signed the “Copernicus Cooperation Arrangement” allowing them to share data “from the Copernicus constellation of Sentinel Earth Observation satellites.”⁸³ Although ESA has the third budget for space activities (6.56 billion dollars), after those of the US (43 billion

⁷⁹ ESA, ‘Cooperation with the United States’, https://www.esa.int/About_Us/Washington_Office/Cooperation_with_the_United_States (Accessed: 02.07.2022).

⁸⁰ Rome, Nathaniel. March 22, 2021, ‘What’s New in the 2020 US National Space Strategy?’, *Georgetown Security Studies Review*, <https://georgetownsecuritystudiesreview.org/2021/03/22/whats-new-in-the-2020-us-national-space-strategy/> (02. 07.2022). See also: Department of Defense, Defense Space Strategy Summary, June 2020, https://media.defense.gov/2020/Jun/17/2002317391/-1/-1/2020_DEFENSE_SPACE_STRATEGY_SUMMARY.PDF (Accessed: 02.07.2022).

⁸¹ United States Space Priorities Framework December 2021 <https://www.whitehouse.gov/wp-content/uploads/2021/12/united-states-space-priorities-framework--december-1-2021.pdf>, p. 6 (Accessed: 02.07.2022).

⁸² United States Space Priorities Framework December 2021 <https://www.whitehouse.gov/wp-content/uploads/2021/12/united-states-space-priorities-framework--december-1-2021.pdf>, p. 6 (Accessed: 02.07.2022).

⁸³ Copernicus, ‘European Union and United States Sign Cooperation Arrangement on Copernicus Earth Observation Data’ (20/10/2015), <https://www.copernicus.eu/ro/node/321> (Accessed: 02.07.2022).

dollars in 2017) and China (8 billion dollars in 2017),⁸⁴ in 2017 Copernicus aided the US predict and formulate a quick response to hurricanes Harvey, Irma, and Maria.⁸⁵

The United States has been better prepared to understand the strategic importance of space since it opened, in December 2018, the U.S. Space Command (USSPACECOM). They were followed by French Space Command, the German Air and Space Operations Centre, the UK Space Command, and the Italian Joint Space Operations Command.⁸⁶ The European countries' actions are considered as contributing to the strengthening of the United States position by encouraging the sharing of information, capabilities, infrastructure, and expertise.⁸⁷

Furthermore, in December 2019 was established the United States Space Force, organised under the Department of the Air Force, becoming the first new branch of the armed services in 73 years, and recognising space as a domain related to the national security.⁸⁸ The new branch will contribute to ensure the United States' space superiority and facilitate the conduct of Department of Defence, NASA and commercial space launches.⁸⁹ This institutional transformation can be seen as an acknowledgement of the outer space for different sections of society: defence, strategic, and economic. The three strategic documents – the National Defense Strategy, the Nuclear Posture Review and the Missile Defense Review released in October 2022 by the Department of Defence – have also highlighted the need for thoughtful and anticipatory actions that will deter any potential attack including in space.⁹⁰

Regarding the further steps taken by the European countries, it is worth mentioning that ESA's Ministerial Council decided on its latest meeting in Paris to increase the new budget by 17% so that it could keep up with United States and China. Moreover, for the next three years

⁸⁴ American Chamber of Commerce to the European Union (AmCham EU), 'EU, Space, Security and Defence Strengthening the transatlantic relationship', p. 6.

⁸⁵ EEAS, 'Space: A New Frontier for the EU-U.S. Partnership' (24.01.2018), https://www.eeas.europa.eu/node/38716_en (Accessed: 02.07.2022).

⁸⁶ Rome, Nathaniel. European Militaries Join the U.S. in Space, *Georgetown Security Studies Review* (07.04.2021), <https://georgetownsecuritystudiesreview.org/2021/04/07/european-militaries-join-the-u-s-in-space/> (Accessed: 02.07.2022).

⁸⁷ Rome, Nathaniel. European Militaries Join the U.S. in Space, *Georgetown Security Studies Review* (07.04.2021), <https://georgetownsecuritystudiesreview.org/2021/04/07/european-militaries-join-the-u-s-in-space/> (Accessed: 02.07.2022).

⁸⁸ United States Space Force, About the Space Force <https://www.spaceforce.mil/About-Us/About-Space-Force/> (Accessed: 02.07.2022).

⁸⁹ United States Space Force, USSF Capabilities <https://www.spaceforce.mil/About-Us/About-Space-Force/Space-Capabilities/> (Accessed: 02.07.2022).

⁹⁰ Todd, Lopez L. 'DOD Releases National Defense Strategy, Missile Defense, Nuclear Posture Reviews (27.10.2022), *DOD News*, <https://www.defense.gov/News/News-Stories/Article/Article/3202438/dod-releases-national-defense-strategy-missile-defense-nuclear-posture-reviews/> (Accessed: 30.10.2022).

of activity, ESA obtained 16.9 billion euros. The three biggest contributors were: “Germany with 3.5 billion euros, France with 3.2 billion and Italy with 3 billion euros, respectively being 20.8%, 18.9%, and 18.2% of the total budget.”⁹¹

Romania’s contribution to ESP

Romania is one of the most active countries in the Central and Eastern Europe area in the space domain. The first formal steps in establishing the space sector in Romania were implemented in 1967 with the creation of the Romanian Commission for Space Activities, in coordination with the international activities encouraged by the Intercosmos Programme in 1967. Romania participated in this programme together with other Central and Eastern European countries and in 1981 was the 11th country which sent its first cosmonaut, Dumitru-Dorin Prunariu, to space. The Romanian Space Agency (ROSA), was established in 1991 and just one year later, in 1992, Romania signed the first agreement with the European Space Agency (ESA) on space cooperation for peaceful purposes.⁹²

As we have seen, Romania is one of the seven European states which is part of the SST Consortium. The legal framework which regulates Romania’s ESA membership is the Law no. 262/2011 which ratifies the Agreement between Romania and the European Space Agency (ESA).⁹³ Thus, in December 2011, Romania became a member of the European Space Agency. The main coordinator for implementing the Agreement is the Romanian Space Agency (ROSA), while the Ministry of Research, Innovation and Digitalisation is managing Romania’s financial contribution to ESA.⁹⁴ Romania was the second Eastern European country, after the Czech Republic, to become an ESA member.⁹⁵

Outer space is within the portfolio of the Ministry of Research, Innovation and Digitalisation and according to the Programme of Government, Romania will be:

⁹¹ SpaceWatch.Global, ‘Aschbacher obtains 16.9 billion for ESA to cover next 3 years activities’ (23.11.2022), <https://spacewatch.global/2022/11/aschbacher-obtains-16-9-billion-for-esa-to-cover-next-3-years-activities/> (Accessed: 24.11.2022). See also: Hephher, Tim. ‘Europe flags space ambitions with spending hike and new astronauts’ (23.11.2022), <https://www.reuters.com/lifestyle/science/european-space-nations-wrangle-over-funding-increase-2022-11-23/> (Accessed: 24.11.2022).

⁹² ROSA, History, <https://www.rosa.ro/index.php/en/rosa-home/history-menu> (Accessed: 03.10.2022).

⁹³ ROSA, History, <https://www.rosa.ro/index.php/en/rosa-home/history-menu> (Accessed: 03.10.2022).

⁹⁴ The Romanian Association for Space Technology and Industry (Romspace), ‘Romania as an ESA Member State’, <http://romspace.ro/romania-esa-member-state.html> (Accessed: 02.08.2022).

⁹⁵ The Romanian Association for Space Technology and Industry (Romspace), ‘Romania as an ESA Member State’, <http://romspace.ro/romania-esa-member-state.html> (Accessed: 02.08.2022).

“Supporting the development of strategic research and development projects

A. Strategic projects will be initiated and stimulated on development directions promoted at the European level and of interest to Romania, including those supported by the National Reform and Resilience Program in the field related to space and security and all space technologies, including collaboration projects with ESA (European Space Agency). ”⁹⁶

Romania has used its capacity as an ESA member to modernise, consolidate and develop its position in the field of space, and, as of 2014, has joined two important projects: the International Space Station (ISS), as a part of the ESA program dedicated to the Space Station, and the development of Ariane 6 rocket.⁹⁷ Romania’s public and private initiatives in the space domain can be considered as adding value to the European approach to space. In June 2021, Romania became only the second European country, after France, to launch its own satellite.⁹⁸ The EcoRocket was built by the Romanian Cosmonautics and Aeronautics Association (ARCA). Romania will contribute to the joint NASA and ESA Mars Sample-Return mission, by being part of the team which will build the Sample Transfer Arm (STA), a robotic arm that will help transfer Mars samples of rock and dust to Earth.⁹⁹ To this impressive success contributes also the high number of graduates of science universities, since Romania has the second highest number of people working as scientists and engineers, after Ireland.¹⁰⁰

In May this year, Romania celebrated 10 years of ESA membership with a conference and exhibition about “Space and Security for Eastern Europe. Romania – 10 years in the European Space Agency (ESA)”. At the event, was presented the Romanian space strategy

⁹⁶ Romania. Programme for Government 2021-2024. Coalition for resilience, development and prosperity , p. 116, https://gov.ro/fisiere/programe_fisiere/Program_de_Guvernare_2021%E2%80%942024.pdf (Accessed: 02.07.2022).

⁹⁷ ROSA, ‘Romania will own a part of the International Space Station and will contribute to the development of the latest European rocket, Ariane 6’ (03.12.2014), <https://www.rosa.ro/index.php/en/news-menu/stiri/787-romania-va-detine-o-parte-din-statia-spatiala-internationala-si-va-contribui-la-dezvoltarea-celei-mai-noi-rachete-europene-ariane-6> (Accessed: 02.08.2022).

⁹⁸ Gherasim Cristian. EU Reporter, ‘Cristia racing to become the second EU country to launch its own satellite’ (07.04.2021) <https://www.eureporter.co/world/romania/2021/04/07/romania-racing-to-become-the-second-eu-country-to-launch-its-own-satellite/> (Accessed: 02.08.2022).

⁹⁹ ROSA, The Mars robotic arm, built with Romanian contribution (03.08.2022) <https://www.rosa.ro/index.php/en/news-menu/stiri/6654-brat-robotic-folosit-pe-marte-construit-cu-ajutor-romanesc> (Accessed: 04.08.2022). See also: ESA, ‘A helping hand for Mars’, https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/A_helping_hand_for_Mars (Accessed: 02.08.2022).

¹⁰⁰ Eurostat, Human Resources in Science and Technology by Occupation HRSTO by occupation, age 25-64, 2021 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:HRSTO_by_occupation_age_25-64_2021_11-05-2022.png (Accessed: 02.08.2022).

based on 3S : Science and Technology, Services and Security¹⁰¹. The Strategy is the outcome of a research grant titled “Strategy for national participation in the new European context for coordinating research in the areas of security and space industry,”¹⁰² coordinated by the Romanian Space Agency.

Romania has also provided expertise in this domain at the international level. Romanian entities have been selected to participate in the HERA mission, the European dimension of the AIDA (Asteroid Impact and Deflection Assessment) mission. The missions aim to monitor and destroy the 65803 Didymos asteroid considered as potentially hazardous, which was already the subject of a kinetic impact by the NASA DART spacecraft in October 2022. ESA’s HERA mission which will start in November 2024 will be guided visually by technology made in Romania.¹⁰³

Having in mind the information analysed in this section, we can conclude that outer space is an important domain of action for Romania and it can be used to offer a high advantage in a cutting-edge industry. More sustained efforts are needed to be sure that all the potential advantages are indeed absorbed by the relevant stakeholders. In November 2022, a new interministerial committee for the development of the normative framework regarding the regulation of activities in outer space was established by the Romanian government.¹⁰⁴ The new structure is expected to contribute to a more efficient activity in the outer space sector.

Conclusions

As we have seen, the development of the European space policy has a long history, rooted in the post-Second World War scientific development and during some of the most difficult Cold War moments. We discussed the evolution of cooperation in outer space for the European countries and analysed the EU’s relationship with the United States and the United Nations in the outer space sector. In this paper, we have seen how, starting with the early ’60,

¹⁰¹ ROSA, European space leaders discuss (16.05.2022), <https://www.rosa.ro/index.php/en/news-menu/stiri/6386-liderii-europeni-din-domeniul-spatial-discuta-la-bucuresti-tematica-spatiu-si-securitate-pentru-europa-de-est> (Accessed: 02.08.2022).

¹⁰² ROSA, Proiect strategie 3S, <https://www.rosa.ro/index.php/ro/cercetare/proiecte-nationale/4889-proiect-strategie-3s> (Accessed: 10.11.2022).

¹⁰³ ROSA, ‘26 September: humanity will deflect an asteroid. Romania’s role in the first ever planetary defence mission’, (22.09.2022), <https://www.rosa.ro/index.php/en/news-menu/stiri/6774-26-septembrie-omenirea-deviaza-un-asteroid-rolul-romaniei-in-prima-misiune-de-aparare-planetara> (Accessed: 10.11.2022).

¹⁰⁴ Official Gazette Of Romania, Part I, No. 1071/4.XI.2022 Decision regarding the establishment of the Interministerial Committee for the elaboration of the normative framework regarding the regulation of activities in outer space, <https://monitoruloficial.ro/Monitorul-Oficial--PI--1071--2022.html>, p. 6 (Accessed: 10.11.2022).

the number of states interested in acquiring capabilities with utility in outer space has continued to increase. However, their number is still limited when compared to other policy areas. The main actors active in this domain were the two superpowers, followed by China.

Today, especially when the European continent is again at a crossroads, the strategic relevance of space is even more significant. The European countries are cooperating in this sector, but more needs to be done to ensure the resources for allowing them to remain relevant in this sector. There is the possibility that the economic role of space will decrease and that the military aspect will become more relevant for outer space. More and more people are relying on mechanisms that use the functions of satellites to act in their daily activities. Also, we can say that outer space is a very important and relevant domain for the future economic development of Europe. Therefore, from this perspective, deepening cooperation with private actors may prove beneficial for the economic sector. As we have seen, there is a certain delay when it comes to the actions in the area of space policy, probably due to the high costs of these actions.

Although present in our modern world more and more in the last two decades, space policy is not very visible in the everyday news. A better communication approach helps increase the citizens' awareness when it comes to this area, especially as most European want more action for using the technology to respond to climate change. We can assume that the fast development in the technology sector will need more cooperation among states and international organisations, because that is how they can better respond to this sector's ongoing challenges.

As the risk of confrontation is real and different threats are looming in the international system, responsible and reasonable steps are needed for managing the outer space. Increasing the coordination of different stakeholders and integrated approaches to space management will help the European economy and will provide a safer and more predictable future not only for Europeans, but also for mankind.

Policy-recommendations

At the national level:

- Encourage more inter-institutional cooperation between the relevant actors, including through a more interdisciplinary approach so that scientists from different fields (not just technical, but also from social sciences) can be involved in this process of researching the outer space and its broader implications;
- Involving the private actors in the consultation process so that the new space approach can be more relevant for all the stakeholders;
- Raising awareness and better communication with the larger parts of society that can benefit from the outputs of this activity in the outer space sector.

At the European level:

- Deepening cooperation with other the United States for space exploration and better institutional cooperation;
- Closer people-to-people contacts to continue to build a relevant community active in this domain;
- A more efficient communication strategy on the part of the institutions responsible in this sector to promote their activities;
- A more coherent mechanism to ensure the goals mentioned in the main documents on the topic are implemented accordingly by the mentioned institutions.

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