The Integration Role of the European Space Agency Background History of the ESA

The European Space Agency (ESA) was preceded by two separate organizations: The European Launcher Development Organization (ELDO)\(^1\) and the European Space Research Organization (ESRO)\(^2\), which were both formed in 1964\(^3\). The two administrations were active until 1974 and 1975, respectively, when they were merged together to form the ESA\(^4\). Over the course of its 10 active years, ELDO managed to launch four rockets successfully, and ESRO launched its first satellite successfully in 1968, and launched a total of seven\(^5\) satellites successfully before it was merged with ELDO. The ESA convention\(^6\) documents were signed by the 10 original countries – Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, Switzerland and the UK – in 1975, but the ratification procedures were not completed until five years later, in 1980. For these five years, the ESA was operational but did not legally exist\(^7\).

The most prominent difference between the two preceding organizations and the ESA\(^8\) was that the organisation redirected the agency’s focus from

---


\(^4\) Ibidem.

\(^5\) Ibidem.

\(^6\) The text of the ESA Convention (Ref. CSE/CS(73)19, rev. 7) was approved by the Conference of Plenipotentiaries held in Paris on 30 May 1975.

\(^7\) J. Kringe, A. Russo, op. cit., p. 1235.

science and theoretical based studies, and instead based the research and funding on satellite applications until around 1981\(^9\), wherein the focus again changed from satellites to development of the Ariane-5 Heavy-Lift Launch Vehicle (HLLV), and the decision to participate in the proposed space station – to become the International Space Station – that was at the time being proposed by NASA for international cooperation\(^{10}\).

In 1983, the ESA’s first EU astronaut was launched into space in a US space shuttle\(^{11}\), along with the first mission for the ESRO-designed Space-lab\(^{12}\). The next significant achievement for the ESA was its first interplanetary mission in 1986, when the Giotto robotic spacecraft successfully studied Comet Halley as it passed the Earth and came within 596 kilometers of the comet’s nucleus\(^{13}\).

In 1988, the Ariane 4 space shuttle was launched for the first time and over the next 15 years, completed 113 successful flights for the ESA\(^{14}\), launching satellites, communications devices and become known as one of the most versatile space launchers available\(^{15}\).

In 1990, the ESA contributed towards NASA’s Hubble Telescope project, which was the largest and most versatile space telescope in the world at the time. The ESA provided funding for the project after budgetary concerns, and also donated one of the instruments for the telescope, solar cells to power the telescope and a number of staff to work on the telescope. In return, the ESA would receive 15% of the overall viewing time on the telescope\(^{16}\).

In 1997, the Ariane 4 was replaced by the Ariane 5, a heavier, larger rocker capable of launching heavier payloads. The final version of agreements concerning ISS were proposed and agreed upon in 1998, by NASA, the ESA, the Russian Federal Space Agency (Roscosmos State Corporation), Japan Aerospace Exploration Agency (JAXA) and the Canadian Space Agency (CSA)\(^{17}\).

\(^{11}\) Dr. Ulf Dietrich Merbold born June 20, 1941.
\(^{15}\) B. Harvey, *Europe’s Space Programme: To Ariane and Beyond*, Springer Science & Business Media 2003, p. 29.
The ISS was built in orbit, piece by piece, over 40 missions, beginning in 1998 with the Russian “Zarya” control module\(^\text{18}\).

### Space Law within EU Countries and the Role of ESA

A number of rules and regulations have been adopted by the ESA concerning projected activities in space, to secure the organization financially and legally, and promote peaceful cooperation between intergovernmental organizations, and to further the science and technology available to all\(^\text{19}\). An historical and current overview of the legal framework in which the ESA operates will be given, and reasons for encouraging these laws will be discussed.

Space law was initially formulated as a necessity when the first satellite, Sputnik, was launched by Russia in 1957\(^\text{20}\). In 1958, shortly after the launching of the first artificial satellite, the General Assembly in resolution 1348 (XIII) established an ad hoc Committee on the Peaceful Uses of Outer Space (COPUOS), composed of 18 members\(^\text{21}\). In 1959 by General Assembly resolution 1472 XIV established COPUOS as a permanent body, which had 24 members at the time, and reaffirmed its mandate for reviewing international cooperation in peaceful uses of space, planning programs in this area to be carried out under UN sponsorship, encouraging research and information dissemination on space issues, and studying legal problems stemming from space exploration\(^\text{22}\). The work of COPUOS has been assisted by the two subcommittees, the Scientific and Technical Subcommittee and the Legal Subcommittee. The Legal Subcommittee is the organ in which 1960s and 1970s within the framework of the ongoing work the main international treaties on space were drafted\(^\text{23}\). These treaties are\(^\text{24}\).


• Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies;25
• Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Space Objects Launched into Outer Space;26
• Convention on International Liability for Damage Caused by Space Objects;27
• Convention of Registration of Objects Launched into Outer Space;28
• Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.29

Since that time, space law has evolved and developed considerably into the complex framework, as the world’s use of space-based resources has increased.30 The ESA has been instrumental in formulating, integrating and evolving these laws as the overview on space research, theory and exploration has changed, and is one of the only space agencies in the world that lists “responsibility” as one of the main priorities of their research.31

The ESA is the main space agency for most of the countries in the EU. The European Community and ESA adopted a framework agreement on 25 November 2003 which entered into force on 28 May 2004. The agreement aimed to provide a basis for “the coherent and progressive development of an overall European space policy” and a “common basis and appropriate arrangements for an efficient and mutually beneficial cooperation” between the two parties.33 The new European space policy (ESP) was adopted by the Commission in April 2007.34 A 2007 document, the European Space Policy,35

---

26 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Space Objects Launched into Outer Space, Apr. 22, 1968, 672 U.N.T.S. 119 [hereinafter the Rescue Agreement].
28 Convention on Registration of Objects Launched into Outer Space, November 12, 1974, 1023 U.N.T.S. 15 [hereinafter the Registration Convention].
29 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 18, 1979, 1363 U.N.T.S. 3 [hereinafter the Moon Treaty].
31 Ibidem.
35 Resolution on the European Space Policy, ESA BR 269 22.05.07.
was created in order to promote peaceful cooperation in the international space community. The policy consists of five major ideas, which are:

1. Coordinating more efficacious civil space programs between the ESA, the EU and their respective Member States that guarantees worth and removes excess copies, therefore meeting the shared necessities of Europe\(^{36}\).

2. Processing and achieving European applications in space such as a global navigational satellite system (GALILEO) and the Global Monitoring for the Environment and Security (GMES) and artificial satellite communication utilization\(^{37}\).

3. Conserving the EU’s independent access to space\(^{38}\).

4. Increasing the activity between defense, national space programs, and technologies in order to pursue, in particular, the ability to make use of the information gained from of civil/military data systems\(^{39}\).

5. Securing the fact that the space policy is consistent with, and assists the logistics of the EU’s external relationships\(^{40}\).

Within the construct of these ESA frameworks, each EU nation is able to create their own targeted space laws, as they see fit, as long as those laws are within compliance to the ESA framework. The European Centre for Space Law is tasked with ensuring that the national level laws created within those countries do not go against any cooperative agreements with other countries in addition to identifying whether or not such national laws are in compliance with ESA laws\(^{41}\). The United Nations (UN) also maintains a collection of the written and enacted laws and regulations for each nation under the United Nations Office for Outer Space Affairs, spanning EU countries and all other countries who are a part of the UN or who have cooperative agreements with EU or UN member states\(^{42}\).

The ESA has been integral in convening these laws through the EU countries, and the laws benefit all EU nations. This is especially so for the “Developing Countries” principle, whereby these countries gain access to the same knowledge as other nations, but through the ESA’s integrated “fair


\(^{41}\) About ESCL, Retrieved from <www.esa.int/About_Us/ECSL_European_Centre_for_Space_Law/About_ESCL> 2017, p. 1.

return” policy, means that they only contribute to mandatory activities, and can opt in or out of others, based on their budgets\textsuperscript{43} or interests\textsuperscript{44}.

At the same time, the ESA has taken international space law, such as the policies above, and the Outer Space Law, to mandate laws to its member states, such as the ESA Convention and the ESA Space Policy. The ESA Convention, which was initiated and opened to be signed\textsuperscript{45} on 30 May 1975, entering into legality on 30 October 1980\textsuperscript{46}, coupled with the Terms of Reference and Rules of Procedure of the ESA Council and secondary members\textsuperscript{47}, supplies the legal structure for reference to making decisions and taking actions within the ESA\textsuperscript{48}. The legality of these agreements warrants the legally tight result of any decision the ESA Council makes along with its subordinate bodies.

The ESA’s ability to come to decisions and the quality of these decisions determine they have discovered the optimum technique of leading and dividing space activities whilst being guided and viewed as an intergovernmental state. The states that are members of the ESA are unequivocally at the center of the ESA’s instrumentation, bearing in mind that the ESA as an organization, and, as a result, nonexempt to international law, does not own a wide range of freedom when it comes to declaring and altering competencies\textsuperscript{49}. As a result of this fact, the construction of the framework of the ESA’s decision-making determines that all significant decisions or actions are decided on by delegates from member states, or the states can determine to refer the decision to the Director General, an authority of the organization\textsuperscript{50}. Nevertheless, it is the member states that possess the power to make significant decisions, regardless of the initial decision of the Director General.

Processing and accomplishing European applications in space like the global navigational satellite system (GALILEO\textsuperscript{51}), fully operational at this

\textsuperscript{43} More about budget and financing national space agencies see: M. Mroczek, Warunki, które determinują wykorzystanie przez Polskę swojego członkostwa w Europejskiej Agencji Kosmicznej, „Prace Instytutu Lotnictwa” 2016, No. 2(243), p. 156.
\textsuperscript{45} ESA Convention and Council Rules of procedure, ESA 2010.
\textsuperscript{47} Ibidem.
\textsuperscript{50} T. Masson-Zwaan, op. cit., p. 13.
\textsuperscript{51} N. Danecka, Współpraca międzynarodowa w zakresie praktycznego wykorzystania sztucznych satelitów Ziemi, „Zeszyt Studencki Kół Naukowych Wydziału Prawa i Administracji UAM” 2011, No. 1, p. 28.
time, and the Global Monitoring for the Environment and Security (GMES\textsuperscript{52}) and artificial satellite usage\textsuperscript{53} is another role taken on by the ESA. The Organisation is responsible for preserving the EU’s autonomous access to space\textsuperscript{54}, increasing the action between defense, national member’s space programs and technological advances and pursue, in particular, the ability to make use of the data gained from civil/military information systems\textsuperscript{55}; Assuring the information that the space policy is accordant with, and aids the logistics of the EU’s extraneous relationships\textsuperscript{56}. The European Space Policy was drafted by the ESA’s Director General and the European Commission, giving the ESA a huge hand in this major step up in policy for Europe’s exploration of space, making it a larger force in the field on a global scale. The ESA has worked closely with the EU for over 15 years now\textsuperscript{57}, and in this time the collaboration has allowed measures to be taken on a larger scale that if a single organization were to tackle it. An example of this is the ESA and EU’s stance on space debris\textsuperscript{58}.

The ESA has also taken measures to attempt to mediate the growing space debris situation. Due to the nature of the ESA, being the fact that it is an intergovernmental organization consisting of multiple countries, many of whom both have their own national space agency and are part of the EU, the ESA has a large stake in the litigation that these countries all adhere to\textsuperscript{59}. This relationship allowed the debris debate to occur at multiple levels at an increased rate, which prompted the current standing body for the problem, the Inter-Agency Space Debris Coordination Committee (IADC), to produce guidelines in 2002 that were hugely influenced by a previous publishing by the ESA, and the current guidelines were advised by the ESA themselves\textsuperscript{60}.

The fact that the ESA is so interlinked between the different national space agencies and the EU gives rise to the indication that they may have

\textsuperscript{53} T. Masson-Zwaan, op. cit., p. 7.
\textsuperscript{54} Ibidem, p. 7–8.
\textsuperscript{56} Ibidem, p. 36.
a part to play in future policy making – when the eventual necessity to reme-
diate existing space debris occurs – aided by the political powers of the EU61.

The ESA and the EU have held consultations since the year 2000, holding an annual “Space Council” since 2004. This is an important event where the two groups discuss their shared goals, and how they can help each other achieve them. Pressing issues, such as space and climate change, the Lisbon strategy, space security and space exploration are discussed, and it was at the 2007 “Space Council” that the European Space Policy was created62.

The 2009 integration of the Treaty on the Functioning of the European Union (TFEU), more often called the Lisbon Treaty63, determine the EU’s competencies in the field of space activities. Although the EU had been working and collaborating with ESA for ten years prior to the treaty, there was no legal framework, obligation or basis for it to do so before the treaty took place.

Paragraph two in Article 4 of the TFEU lists the areas of shared competence between the EU and its member states, which include transport, and, thus, aviation. Any relation to space in the article is not made until paragraph three, which proposes: “In the areas of research, technological development and space, the Union shall have competence to carry out activities, in particular to define and implement programs; however, the exercise of that competence shall not result in Member States being prevented from exercising theirs”64. The fact that “space” is mentioned in Article Four of the treaty gives the implication that it is a “shared” competence, as the name of the article states. Moreover in Article 189 TFEU stipulates that The Union shall establish any appropriate relations with the European Space Agency.

Still, due to the fact that it is not included in the list of shared competencies in the second paragraph but in a removed paragraph, the “space” competence, has been given a somewhat specialized treatment by the Treaty, allowing the EU to exercise unique reflections on its space competence. This means that in the case of the “average” mutual competencies detailed in the second paragraph, all member state’s competencies are ancillary to the EU competence, meaning that an individual state can exercise their competence

61 J. Wouters, P. De Man, R. Hansen, op. cit., p. 9.
only if the EU does not, and is not planning to, use its own competence; this is what is named in the legislation as the “preemption principle”\textsuperscript{65}. In the context of space, the competencies of the EU and its member states are co-existent in the sense that a member state of the EU does not have to delay their own actions whilst they wait for the EU to make a decision on its own action.

Closer ties and an increase in cooperation between ESA and the EU, beginning with the increased freedom of the member states in the act of space-related decisions, and coupled with the financial and political backing of the EU, will bring substantial benefits to Europe by guaranteeing member states full and unrestricted access to services provided by space systems in support to its policies, and encouraging the increasing use of space to improve the lives of its citizens\textsuperscript{66}.

For existing joint enterprises between the EU and the ESA, consider such items as the European Geostationary Navigation Overlay Service (EGNOS)\textsuperscript{67}, the global satellite navigation system called “Galileo”\textsuperscript{68}, and Global Monitoring for Environment and Security (GMES) initiative\textsuperscript{69}. In April 2014, the GMES programme was renamed Copernicus in a regulation extending European Union support for the programme\textsuperscript{70}. Copernicus is composed of various systems: earth observation satellites and in situ sensors such as ground stations, airborne and sea-borne sensors\textsuperscript{71}. The ESA is in charge of developing the Sentinel satellites that represent the main part of the space segment of Copernicus. The programme collects and processes the data received from its systems across six thematic areas: land, marine, atmosphere, climate change, emergency management, and security. The data allow public authorities and private companies to develop services on a wide range of applications from environment protection and management of urban areas to fisheries, civil protection and tourism\textsuperscript{72}. These technological


\textsuperscript{66} Esa And The Eu, available online at: <www.esa.int/About_Us/Welcome_to_ESA/ESA_and_the_EU(print)> (access: 2.07.2017).

\textsuperscript{67} Agreement between the European Community, the European Space Agency and the European organisation for the safety of air navigation on a European contribution to the development of a global navigation satellite system (GNSS), OJ L 194, pp. 16–24, 10 July 1998.


aspects aside, the EU and ESA have also agreed upon ways to co-ordinate their scientific research and technological evolution attempts, specifically in the area of technologies.

Also included in the entry of the Lisbon Treaty is the European Union’s plans for a European Space Program, for which the EU has a specific competence\textsuperscript{73}. The execution and planning of this space program is anticipated to imply more levels of group action between the ESA and the EU, using the ESA’s space and technological knowledge, and the EU’s political and financial power.

The increased number of large-scale programs formulated by the European Space Council and the EU in recent years has increased discussions concerning the militarization of space for non-peaceful purposes. For the majority of the past, until recent years, the EU and ESA collaborated purely on the research and undertaking of non-military activities with regards to space, however the legislation detects a new displacement towards defense and security content, as represented, for example, by the reality that in 2008, the ESA Ministerial Council acknowledged the agreement to designate funding to the cause of Space Situational Awareness (SSA)\textsuperscript{74}. This can be coupled with the fact that the EU acknowledged the military implications of the Galileo device\textsuperscript{75}. The inquiry remains whether these implications are in understanding with the ESA Convention or with EU law, but it goes without question that many of the high technology devices developed by the ESA could technically be used for military purposes\textsuperscript{76}.

A paper on ESA and the Defense Sector published in 2004 provided the established representation of the “peaceful purposes” grammatical construction in the ESA Convention, which could be construed as anything that was not offensive or aggressive, and determined the potential of outer space for the utilization of security and defense mechanisms of the highest caliber\textsuperscript{77}. The ESA’s “Space Situational Awareness Preparatory Program” (SSA-PP) has the overall objective to give assistance to Europe’s autonomous employment of and access to space, given the focused goals of transmitting timely and accurate satellite content, information and service with regards to the space situation, paying close attention to anything that could cause da-

\textsuperscript{73} Official Journal of the European Union, 6 August 2004, p. 261, 310.
\textsuperscript{74} N. Bobrinsky, L. Del Monte, op. cit., pp. 392–398.
\textsuperscript{75} J. Hasik, M. Rip, \textit{An Evaluation of the Military Benefits of The Galileo System}, 15\textsuperscript{th} International Technical Meeting of the Satellite Division of The Institute of Navigation 2002, p. 320.
mage to the member states in both the EU and the ESA\textsuperscript{78}, which given the increasing technological advantages of recent years, could become an increasingly worrisome notion.

**Conclusions**

The ESA is still the mainframe of the European space agenda, and is only becoming more of a global factor with increasing support and political collaboration from the EU. With a stronger unified voice between the ESA, the EU and the respective member states of each group, Europe as a space power can begin to show strength on a global scale, and have a true say in international issues such as space debris, militarization of space and the updating and mediating of space laws. Although space laws were created out of a necessity for international cooperation and concern over the type of technologies launched into space and the purpose for which they were used, in addition to concerns associated with the safety of the planet and the people who inhabit it, since the 1950s, they serve as a unifying factor, allowing for international collaborations regarding space technologies and space explorations in a manner not previously seen.

Nevertheless cooperation between ESA and EU is very difficult and nowadays in author’s opinion is a biggest challenge\textsuperscript{79}. By 2015, ESA was an intergovernmental organisation of 22 member states. The national bodies responsible for space in these countries sit on ESA’s governing Council: 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.

Canada also sits on the Council and takes part in some projects under a Cooperation Agreement. Slovenia is an Associate Member. Other EU states also have Cooperation Agreements with ESA, such as Bulgaria, Cyprus, Lithuania and Malta. Latvia and Slovakia are participating in the Plan for European Cooperating States (PECS)\textsuperscript{80}. In the communication from the Commission to the Council and the European Parliament we read that ESA’s members include Norway and Switzerland, which are not EU members. Canada has a bilateral cooperation agreement with ESA. As the collaboration


\textsuperscript{79} I. Słomczyńska, op. cit., p. 129.

\textsuperscript{80} *New Member State*, available online at: <www.esa.int/About_Us/Welcome_to_ESA/New_Member_States> (access: 2.07.2017).
between the EU and ESA grows, this asymmetry combined with a voting system where each Member State has one vote in the ESA Council and the key decisions within this body are adopted by unanimity gives ESA members, which are not members of the EU, disproportionate leverage over matters that may affect the EU\textsuperscript{81}. Moreover, relations between the EU and ESA are affected by the asymmetry regarding political accountability. The fact that ESA as a European agency has no formal link with the European Parliament deprives ESA of the direct link with citizens that any EU policy enjoys\textsuperscript{82}

Under the unifying heading of the ESA, EU member states have been able to work to form their own laws and regulations regarding the interactions of their own countries and their own scientists in space, using the framework created by the ESA as a means of guiding and directing the approach each country wants to take. While some EU countries do not have the same levels of development as others do in terms of space exploration and even space tourism\textsuperscript{83}, the presence of the ESA’s definitive framework offers the structure necessary for the development of the industry within each subsequent EU nation. The ESA serves as the means through which it is possible to allow for the meeting of minds of some of the best and brightest in their fields. Through continued support and collaboration, and increased efforts by humanity to take to the stars, the ESA will be around for many years to come.

\textbf{Literature}


\textsuperscript{81} Communication from the Commission to the Council and The European Parliament, Establishing appropriate relations Between the EU And The European Space Agency (Com/2012/0671).

\textsuperscript{82} Ibidem.

The Integration Role of the European Space Agency Background History...

Harvey B., Europe’s Space Programme: To Ariane and Beyond, Springer Science & Business Media 2003.
Kaluga Ł., Współczesne tendencje regulacyjne międzynarodowego prawa kosmicznego, „Kwartalnik Prawa Publicznego” 2007, No. 7(4).
Kiszka K., Przestrzeń pozaziemska obszarem zainteresowania nauk o bezpieczeństwie. Kosmiczny wymiar bezpieczeństwa Polski, „De Securitate et Defensione. O Bezpieczeństwie i Obronnosci” 2016, No. 2(2).
Podemski M., Europejska Agencja Kosmiczna, „Przegląd Geologiczny” 2005, No. 3(53).
Streszczenie

Funkcja integracyjna Europejskiej Agencji Kosmicznej

Słowa kluczowe: agencje kosmiczne, organizacje międzynarodowe, prawo kosmiczne, Europejska Agencja Kosmiczna.

Organizacje międzynarodowe pełnią różne funkcje, m.in. regulacyjną, operacyjną oraz kontrolną. Europejska Agencja Kosmiczna (ESA) jest opisywana w literaturze przedmiotu w większości przypadków przez pryzmat jej funkcji operacyjnych, najczęściej z pominięciem pozostałych. Celem niniejszej pracy jest próba ukazania wzajemnego oddziaływania Unii Europejskiej i ESA na kreowanie polityki kosmicznej państw wchodzących w skład UE i nie tylko. Fakt, iż te dwie organizacje nie są ze sobą hierarchicznie powiązane, stanowi interesujący przyczynek do rozważań naukowych i współpracy w zakresie eksploracji kosmosu czy też realizacji wspólnych projektów naukowo-badawczych, takich jak EGNOS, Galileo, Copernicus. Zdaniem autora za niezbędne należy uznać dalsze pogłębianie współpracy pomiędzy wymienionymi organizacjami, tak by Unia Europejska mogła stać się realnym konkurentem w zakresie eksploracji kosmosu dla takich państw jak USA, Federacja Rosyjska, Chińska Republika Ludowa, Japonia i Indie.