

Aneta Bąk-Pitucha

John Paul II Catholic University of Lublin, Poland

**THE COOPERATION OF THE VISEGRAD GROUP (V4) STATES
IN THE SPACE SECTOR** <https://doi.org/10.2478/ppsr-2025-0017>

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Author

Aneta Bąk-Pitucha, PhD in Political Science (doctor of humanities in the field of political sciences), researcher at the John Paul II Catholic University of Lublin, Poland. She is the curator of the National Security Scientific Circle. She is the author of monographs, numerous scientific articles, and reviews. She is also a member of many scientific societies. Organizes scientific conferences and is a member of the Team of Experts of the Catholic University of Lublin. Research interests focus on topics related to international relations, formats of cooperation in the region of Central and Eastern Europe, as well as national minorities and ethnic groups.

 <https://orcid.org/0000-0002-6672-6504> anetabak@kul.pl**Abstract**

The Visegrad Group has been in existence for over three decades. The four countries of Central Europe – the Czech Republic, Hungary, Poland, and Slovakia – have become a key area of regional development in many spheres – from political, through economic, to socio-cultural. The changes taking place in the immediate region of Europe, which began in 1989, primarily involved the domestic and foreign policy of the above-mentioned countries. These transformations also included relations with new neighbours and the process of European and Euro-Atlantic integration. The Visegrad Group states achieved their priority goals of membership in the European Union and NATO, which strengthened ties and cooperation. Due to the annexation of Crimea by Russia and the deepening conflict in Eastern Ukraine, which definitively changed the approach to security in the immediate European environment, defence issues dominated mutual contacts between the V4 members. Hence, the Visegrad Group states have expanded international cooperation in the space sector. Currently, according to the report of experts from the Polish Space Agency, the Visegrad Group countries participate in various initiatives in the area of space activities. The aim of the article is to present the degree of development and involvement of the Visegrad Group states in the field of space policy. The analysis of selected aspects of cooperation will attempt to answer the question about the prospects for further activity in the face of new challenges and threats of the 21st century.

Keywords

Visegrad Group, V4, Polish Space Agency, European Space Agency, space policy

Introduction

It is worth emphasizing that when considering regional security, especially from the Poland's perspective, it is about the security of the Central European region. There are many distinct perceptions of the V4 unity and the region in general. The V4 states have achieved common goals and are members of both the EU and NATO. The V4 states have been

cooperating for over 30 years, although the dynamics of that cooperation varies as political options take different approaches and the place of foreign policy is variously defined across the states concerned. The Visegrad Group is one of the many formats of regional cooperation. Others include the Weimar Triangle and the Three Seas Initiative (The Three Seas Initiative, 2025).

Space is a platform for increased activity not only of superpowers, but also of other countries, including European ones. During the Cold War, space was explored by the USA and the USSR. Initially, customary norms prevailed, but over time appropriate regulations were developed. In the field of space lawmaking, the UN has been vested with a dominant role. The first document was the Treaty on Principles for the Activities of States in the Exploration and Use of Outer Space, Including the Moon, and Other Celestial Bodies, signed in Moscow, London, and Washington on 27 January, 1967 (Stankiewicz, 2010, pp. 110–111).

Nowadays, space is an area of new opportunities for technological advancement and the activities of multiple actors, both state and private. Space exploration is undoubtedly a fascinating and expensive exercise, requiring huge financial outlays and the involvement of numerous parties. On the other hand, when it comes to security policy, efforts to explore outer space seem to be very important, or even crucial, especially in the context of the rivalry between the superpowers and increasing their influence. Currently, Poland is implementing the most extensive international space cooperation framework with Belgium, the Visegrad Group states and Ukraine (before the war) – according to the report prepared by experts of the Polish Space Agency (Balcer et al., 2021, pp. 24–94).

This article consists of two parts. The first provides analyses of the space sector from the perspective of legal sciences, while the second offers a view from the perspective of political science and administration. This publication shows a dualism of research methods. During the preparation of the article, desk research methods were used. These include the method of analysis of written sources, which is a consequence of the use of qualitative content analysis. Comparative and systemic methods were also applied in the preparation of the content, enabling the collection of data necessary to solve the research problem, i.e., the relevant data in the databases of the European Space Agency and the Polish Space Agency, the data available in the related literature, and articles published in the news media.

The aim of this article is to show the involvement of states in space cooperation and, therefore, the following hypotheses are put forward:

1. Space is an area of competition between countries, due to its scientific, military, and information potential.
2. Cooperation between the V4 states is important to the security policy of these countries.

In order to prove the above hypotheses, the following research questions were posed:

1. What are the activities of the countries in the space sector?
2. What are the possibilities available to the V4 states?
3. What are the prospects for cooperation between the V4 states in the space sector?

The genesis of the space policy in the V4 states Poland

Poland is actively involved in international projects aimed at strengthening space-related defence capabilities. The Polish Space Agency (POLSA) was established by the Act of 26 September, 2014 (Journal of Laws 2014 item 1533) and its main task is to support the Polish space industry by connecting the worlds of business and science and assisting domestic entrepreneurs in obtaining funds from the European Space Agency (ESA). The Polish sector's active cooperation with the ESA began *de facto* in 2007, when Poland signed the Plan for a European Cooperating State – PECS. In 2012, the ESA Council unanimously approved Poland's accession to the ESA (Wachowicz, 2017). POLSA has been cooperating with ESA since 2012 (IGNIS, 2024). The Polish Space Strategy was adopted by the Council of Ministers by Resolution No. 6 of 26 January, 2017 (Monitor Polski, 2016). In the context of space policy, the V4 states' membership in the EU and NATO should be taken into account, which is also part of the V4 security policy (space policy and NATO membership are also part of the security strategies of the Visegrad Group states, The Defence Concept of the Republic of Poland (Ministry of National Defence, 2020), The Security Strategy of the Czech Republic 2023 (Ministry of Foreign Affairs), the Defence and the Security of the Slovak Republic (Ministerstvo obrany Slovenskej republiky, 2021 a, b), Hungary's National Security Strategy (Nemzeti Jogsabalytar, 2020).

Poland seeks close cooperation with allies to develop satellite and defence technologies. Their main goal is to strengthen Polish capabilities in the area of space security and gain access to state-of-the-art technologies. The Ministry of Defence (MoD) plans to sign new contracts for the purchase of satellites for the Polish Army. The Ministry expects that the first such satellite could be launched into Earth orbit as early as 2025. There was mention of satellites among the number of planned purchases communicated by the Deputy Minister of Defence. The implementation of military space projects is one of the key elements of Poland's defence strategy. Poland anticipates significant expenditure on the development of military space projects. The projects are aimed at strengthening the country's defence capabilities and developing autonomous satellite systems. From the scant information revealed by the Ministry of Defence, it appears that Poland intends to launch its first radar satellite by 2026. On the other hand, an analysis of the growth momentum in the domestic space sector suggests that Polish industry has developed adequate and sufficient capabilities to meet this vital need of the Polish Armed Forces. Hence, the Ministry of Defence's long-term plans call for the construction of a hybrid constellation consisting of both radar and optoelectronic satellites. The result is to be a comprehensive satellite surveillance system. This will give the Polish military quick access to satellite data, crucial in creating defence strategies and developing operational plans. Funding for military space projects in 2025 comes primarily from the budget of the Ministry of Defence. Poland also benefits from international financial support, including loans offered by the European Investment Bank (EIB), which enables large-scale investments. Funds obtained from the EIB, are estimated at around €300 million. This creates options for covering all costs of building and deploying observation and radar satellites in support of the Polish Armed Forces (Wojsko Polskie, 2022).

The Czech Republic

The Czech Republic began cooperating with ESA in 1996, but it was not until 2008 that it became an ESA member state (the accession document was signed in Prague on 8 July, 2008). In the area related to the Copernicus program, the Czech Ministry of Transport (Ministerstvo dopravy) works shoulder to shoulder with the Ministry of the Environment. One of the successes of the Ministry of Transport was the establishment of the European GNSS Agency (GSA) headquarters in Prague, transformed into the European Union Agency for the Space Programme (EUSPA) in 2021. The Czech Republic's Strategic Framework 2030 document identified Czech economic priorities, including the development of R&D and innovation policies for productivity growth. To this end, the Czech Republic has launched a scheme of government support for industrial development (Balcer et al., 2021, pp. 24–32).

Slovakia

Slovakia is active in physical science research and astronautics. In the Slovak Republic, the Ministry of Education, Science, Research, and Sports (Science and Technology section) is responsible for space policy. Slovakia implements various projects in collaboration with the ESA. The framework of the current Slovak space activities includes operating satellites, constructing satellite parts, participating in space diplomacy, as well as the relatively recently started cooperation with the ESA. The first, and so far, only, wholly Slovak-made satellite, named skCUBE, was launched on an Indian Space Agency (ISRO) rocket in August 2017. The satellite was designed and constructed by the Slovak Organization for Space Activities (SOSA). Slovakia did not become an ESA associate state until 2022, which status will allow it to further develop sustainable space capabilities. Slovakia's main goals are to build synergies between academia and industry and, partnerships at regional and international levels, within and outside the Visegrad Group (Tinjod & Airey, 2022; Balcer et al., 2021, pp. 64–70).

Hungary

Hungary has participated in the INTERKOSMOS programme since 1967. In the 1980s, the first Hungarian astronaut, Bertalan Farkas, was sent into space. In the 1960s, the Government Commission for Space Exploration was established to coordinate Hungary's space activities. In 1978, its function was taken over by the Intercosmos Council of the Hungarian Academy of Sciences. In 1991, Hungary signed its first cooperation agreement with the ESA. In 1992, the Hungarian Space Office (HSO), responsible for space policy, was established. Particularly active is the Hungarian Space Cluster (HUNSPACE), which usually represents the Hungarian sector at international events. Mention should be made of MaSat-1 – a CubeSat satellite, being the first Hungarian artificial satellite in orbit around the Earth. It was launched in 2012 on an Italian Vega rocket together with other CubeSat satellites built at European universities (including the Polish PWSat satellite). Since joining the ESA in 2015, Hungary has been active in microgravity (various ISS projects), life sciences, space science (aeronomy, magnetosphere physics, interferometry), Earth observation (remote sensing), GNSS applications in navigation, geodesy, and geodynamics, telecommunications, and education (Tinjod & Airey, 2022, pp. 82–93).

In addition to its relationship with the ESA, Hungary has government cooperation agreements with Russia. Since 1999, Hungary has also cooperated with EUMETSAT (it only became a member in 2009). Hungarian entities cooperate with the Ukrainian, Indian, Polish, and Romanian space sectors. Important partners of the Hungarian state in the field of space activities are institutions and industrial companies in Israel and France (Space24, 2025). The greatest opportunities for industrial and scientific cooperation between Polish and Hungarian entities may lie in the following programmes: earth observation, space security, generic technologies, and scientific projects. Of particular interest to Polish entities may be Hungary's experience in the construction and integration of satellite systems, as well as competence in the production of electronics (Do Rzeczy, 2020).

Discussion

Despite the disagreements between the V4 states, and especially the differences between Polish and Hungarian policies, joint initiatives are being undertaken, such as training for the mission to the International Space Station (ISS). In 2024, a Polish astronaut Dr. Sławosz Uznański began training in preparation for the Polish mission to the ISS, scheduled for 2025. The training was held in the US and in addition to the Pole, its participants included Tibor Kapu, a Hungarian astronaut, and representatives from the US and India. The mission is scheduled to take off from NASA's Kennedy Space Center in Florida. The flight to the ISS will be conducted by SpaceX's Falcon 9 rocket, which will lift the Dragon crew capsule into orbit. The Pole's participation in this mission is the result of cooperation and a signed agreement between the Ministry of Development and Technology and the ESA. Also involved on the Polish side is the Polish Space Agency (POLSA), as an executive agency competent of the Ministry of Poland (POLSA, 2020).

The Ax-4 mission has been approved by the ISS Multilateral Crew Board, the international body responsible for the management of the ISS. The Pole's participation in this mission is a landmark event for Poland, especially for the country's technology industry. This could open avenues for long-term development and increased international competitiveness (Załoga Ax-4 w Warszawie, 2025).

Forward-looking regarding the global space sector and various types of ventures is also no novelty for the Czech Republic, which signed a cooperation document with the US company VAST in the autumn of 2024. The two sides are to cooperate on potential manned missions to the International Space Station (ISS) or the future commercial orbital outpost Haven-1 (Kaczanowski, 2024). It is worth noting that VAST is working with SpaceX.

Slovakia also has an ongoing presence in space sector projects. Many Slovak companies are participating in the European space program, as assured by the Director of the Slovak Space Office – Industry Branch, Michal Brichta, who attended the 17th European Space Conference in Brussels on 28–29 January, 2025. A significant increase from 20 to 50 in the number of Slovak companies engaged in various areas of the space economy in Slovakia, was presented. This mainly involves the development and production of satellite hardware and components for satellite units, as well as the area of remote Earth observation and the use of satellite data and signals for various applications such as critical infrastructure, agriculture, or transportation (Brichta, 2024).

We are observing a decline in the of cooperation between the V4 states. The main reason is the discord between the V4 states when it comes to the policy towards the war in Ukraine and the attitude towards Russia. Unfortunately, Putin is arming and strengthening his military potential. Still, not all countries in the region treat Russia as an enemy, the examples being: Hungary, or Slovakia. Another cause of division within the Visegrad Group is the policies of the current governments, but governments do not last forever. As such, there is a chance for change. However, the geographical location, similar level of economic development, common interest, and potential of the countries remain unchanged.

According to many experts, especially military experts, it is important for EU countries to develop a common position in the face of security threats. Implicit in this is the threat from Russia's neo-imperialist policies and the inconsistent attitude of the US toward the EU. The strength of the EU and its policies at every level lies in the union of all its member states upholding common interests (MSN, 2025). European countries should take steps to unite. Europe is in a difficult situation because of divergences and, internal divisions, but also because of the changing approach of the US administration. EU countries should take steps toward unity, strengthening the defence system, including by allocating more funding for defence and space policy. In this case, the pursuit of the European Union's strategic autonomy becomes an important issue (Smolik, 2024, pp. 259–271).

Table 1. The analysis in spending on space policy

State	2019 National Budget PLN	2021 National Budget PLN	2023 National Budget PLN	Contributions to ESA in 2019 in million EUR	Contributions to ESA in 2021 in million EUR	Contributions to ESA in 2023 in million EUR
Poland	387.7 bn	494.8 bn	604.4 bn	42.64	38.96	69

Source: Revenue, expenditure – execution. (2017–2024). <https://www.gov.pl/web/finance/revenue-expenditure-execution>.

The analysis in the table indicates an increase in spending on space policy. The development of the Polish space sector should lead from basic research to the provision of technology and production of subsystems, and in the long term even to satellite systems (Polska Strategia Kosmiczna, 2017).

Hungarians are working quite intensively on space research. They have achieved considerable success, although it should be remembered that, like Poland, they owe this mainly to students from technical universities and colleges who participate in work on innovative technologies. Space projects involving Hungarian researchers are currently underway. These are mainly Hungarian-Russian space research projects, one of the goals of which is for a Hungarian astronaut to start working at the International Space Station by the end of 2025. The Hungarian space industry and the results of its research teams are recognised worldwide (Hungary today, 2024). Poland, along with Hungary, participated in the multinational space mission Ax-4 (IGNIS) in June and July 2025. One of the astronauts was Dr Sławosz Uznański-Wiśniewski, who conducted various scientific and educational experiments (Multinational space missions, 2025). Poland has prepared 13 experiments in cooperation with the European Space Agency, which has the potential to open up new opportunities for the development of Polish space technologies and science. The Ministry of Development and Technology and the Polish Space Agency were responsible for se-

lecting these experiments, and a number of Polish universities, such as the University of Wrocław, the Military University of Technology, the University of Silesia, the University of Zielona Góra, and many others, participated in preparing the experiments (Mitkov, 2025). The Polish astronaut's mission is also an opportunity for Polish companies and entrepreneurs. Domestic companies, such as Scanway, KP Labs, and SatRev, develop and deliver advanced solutions in the field of satellites, Earth observation systems, space optics, and data processing technologies. This shows that Poland is becoming an important player among global suppliers to the space industry (Kieszek, 2025).

Hungarian national values and interests in the context of the European security system, like those of Poland and the other Visegrad Group states, are closely linked to membership of NATO and the EU. This approach is exemplified by the guidelines contained in the individual security strategies of the Visegrad Group.

When it comes to economic relations, apart from the European market, the V4 also have partners such as China, and South Korea. In addition, there is close cooperation in the field of defence and security, which stems not only from NATO membership commitments, but also from new threats such as the migration crisis and the war in Ukraine (Framework for an Enhanced Visegrad Defence Planning Cooperation, 2025). According to many experts, including Hungarians such as Csaba Gyorgy Kiss, Istvan Kovacs, and Akos Engelmayer, the idea of the Visegrad Group was a very good one. However, despite common goals and actions taken to implement the original assumptions, paradoxically, a distancing could be observed, especially in Polish-Hungarian relations. Experts and researchers claim that neither the government of Jozsef Antall nor that of Viktor Orbán, both right-wing formations, treated relations with Poland with sufficient importance. It is worth mentioning here that Viktor Orbán wrote his master's thesis on the Polish anti-communist opposition and often travelled to Poland, where he took part in demonstrations. However, post-communist governments in Hungary pointed out that the weakness of these relations stems from Poland's ambitions to become a regional power, which should not conflict with the national interests of Hungary or the other V4 countries (Górny & Cebula 2020, p. 76, p. 115; Kiss, 2015, 2016).

In conclusion, despite political differences, social and cultural activities between the V4 continue unabated. There are associations and other social and cultural institutions that undertake activities aimed at strengthening cooperation, establishing contacts, and supporting mutual initiatives and cultural, scientific, and educational projects. And even if there is no agreement at the government or parliamentary level, cooperation between the presidents of the Visegrad Group is running smoothly. Beyond the political differences between the Visegrad Group, it is important to focus on the similarities and opportunities, of which there are many. One of them is the economy, others include cooperation between people in the fields of science, culture, tourism and, indeed, the space sector.

Conclusions

In response to the three hypotheses presented in the introduction, it should be noted that space is a key area of cooperation for the Visegrad Group. The Visegrad Group states are becoming increasingly important in research into another area that is crucial for the development of civilisation, namely artificial intelligence. To support this argument, we can cite the example of Hungarian scientists from the Wigner Research Centre for Physics.

Their research is aimed at creating better AI systems (Hungarian scientists' innovative approach to AI research, 2025). In addition, students from technical colleges and leading universities, mainly in Poland and Hungary, cooperate in the fields of space research and the development of innovative technologies. This is done through the exchange of research teams, the organisation of conferences and symposia, internships, and research work, which will undoubtedly increase the effectiveness and importance of the V4. The Czech Republic and Slovakia are active in the space sector, as already mentioned. Undoubtedly, investments in the space sector and in modern technologies will increase the importance of the V4, also in economic areas, which will allow them to compete more strongly with the USA, China, Russia, Germany, France, and the United Kingdom.

Today, space is becoming an increasingly critical area of operations not only for civilian exploration agencies, but also for the armed forces. Rising global tensions, technological advances, and increased risks of space activities are causing countries around the world to invest in the development of space defence technologies. The Visegrad Group, like other participants in international relations involved in the space sector, are striving to develop and be able to use advanced technologies. They seek participation in the development and production of satellite hardware and components. Space technologies are advancing people's lives by affecting security and the development of air, sea, and road transportation, also meteorology, banking, and international trade. They are increasingly integrated into everyone's daily life. The European Commission forecasts that EU profits from the space economy will run into billions of euros. As a result, there is no doubt that the Visegrad Group states also want to share in the profitability of the space sector.

Undoubtedly, a clear decline in the cooperation between the V4 surfaced at the Prague summit in 2023. The main reason is, certainly, the deep discord between the V4 states when it comes to the government policies, as well as the position on the war in Ukraine. In addition, the division within the Visegrad Group has significantly widened following the change of government in Warsaw as the leaders of the Civic Coalition are clearly closer to Prime Minister Petr Fiala and much less aligned with Robert Fico or Viktor Orban. One solution would be to freeze cooperation, but a reduction in activity at politically important levels would be nothing new in the history of the V4: in the past, cooperation within this format significantly dwindled, only to revive after some time. It was similar with the Weimar Triangle. Today's problems in cooperation are a consequence of significant political differences between the political parties that make up the governments of the V4 states. But it is clear that governments do not last forever. On the other hand, the geographical location and similar levels of economic development, common interests, and the potential of these countries at various levels remain unchanged. Security policy and, military cooperation within NATO and the space sector can significantly strengthen cooperation between the V4 states.

The establishment of the Visegrad Group is an intriguing example of European integration. It is an integration of young democracies which, burdened by their communist legacy, have set themselves the common goal of moving closer to Western European structures, which are a reliable guarantor of security on the international stage. These events certainly had an enormous impact on the lives of millions of citizens and determined the dynamics of political, social, and economic transformation. Faced with this diagnosis of the situation and challenges, the V4 states must answer a number of questions related to the future of the V4 format. The Visegrad Group as a whole must answer the

question of what are its prospects for joint initiatives and what its willingness is to continue cooperation? Among the factors weakening V4 cooperation in recent years, Russian policy towards the crisis in Ukraine and the actions it has taken have come to the fore, which unfortunately have also left their mark on the unity of Visegrad cooperation. The conflict in Ukraine has highlighted significant differences and disagreements between the V4 states in their assessment of the situation and Russia's role in the conflict, as well as in their perception of the European Union's response to the eastern power.

The Visegrad Group format of regional cooperation is undoubtedly a form of dialogue and cooperation between Member States, focused on a specific geographical region. It is of significant importance because it allows for the strengthening of dialogue and cooperation, including in the field of security, the exchange of experiences facilitates the implementation of EU priorities, promotes European values, and supports key elements of infrastructure of regional importance, such as the Eastern Shield or the Baltic Defence Line.

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