The Newest Dimension of Global Partnership as a Basis for Space Exploration

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The relevance of this article is due to the need to form a new paradigm of cooperation in the study of outer space and further use of space resources. The article defines global partnership as a necessary form of cooperation of space states with the involvement of all other subjects interested in this plane. The study was conducted on the basis of the analysis of the latest examples of global partnerships for space exploration, the principles of space exploration, and the legislation of some states. The article reveals the global partnership as a modern basis for space exploration, which consists in the formation of a joint global strategy for space exploration and the implementation of joint innovative, open, interdisciplinary space exploration activities, which are built on the priority of peace and security and serve to obtain equal opportunities to the use of space resources.

Keywords: global partnership, principle of equality, space cooperation, space innovation, space legal relations, space partnership, space states.

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Introduction

Social development is one of the fundamental prerequisites for revising and clarifying scientific knowledge, views and ideas about the internal structure and functionality of certain processes and phenomena. The boundaries of established fields of research and the scope of issues requiring scientific support are rapidly expanding. Among them, space occupies the most innovative and spacious place.

For quite a long time, research and development of outer space has been a privilege for certain subjects of the world arena. Having sufficient resource potential and a scientific and technological background, they laid the foundation for a renewed world perception of space assets, the formation of new approaches to space activities. And although this area is still relatively closed due to the complexity of organizational and technical processes, their cost, it gives the greatest impetus to the development of innovations.

Despite the rapid development of space relations and spheres adjacent to space, in today's conditions, it is still impossible to talk about the independent study of space, which actually indicates the need for partnership both between the leading space actors and with all other subjects of the development of the space industry. However, even under the conditions of a partnership, space exploration is impossible in the discourse of minimizing all negative factors, factors and risks from such activities, since such a partnership must be global in nature, based on a clear normative basis.

Global partnership is not a new concept for humanity. Functioning examples of global partnership are the functioning of such international organizations as the UN, WHO, IAEA, etc. At the same time, only the governmental level cannot be applied in the conditions of studying outer space. In the aspect of the development of space research, government institutions and private entities should act together, thus ensuring both the safety of space research and its comprehensive activity.

While supporting the need for a global administrator for space exploration (Soroka, 2020a; Soroka, 2020b) it is also safe to point to the provision of a new dimension of global partnership as a foundation for space exploration. It is the global partnership that transforms the interests of society, the government, and private companies into a single joint result of achieving the goal in space exploration.

The essence of global partnership and its role for space exploration

Space exploration is a symbolic field of space activity where traditionally only recognized space forces have been active. However, new subjects are showing great interest in it, mainly for reasons of international prestige, more and more of them are building ambitious plans. Complementing national efforts, international cooperation has become a central element of most countries' intelligence strategies because the costs of doing it alone are too great. Europe's development into a full actor in space exploration requires a joint assessment of the future challenges, threats and opportunities it will face in order to find the best cooperation options to lead and anticipate, rather than follow and tolerate change (Nicolas & Stoffl, 2009).

The Global Partnership for Effective Development Cooperation is a multi-stakeholder primary vehicle for improving development effectiveness to "maximize the effectiveness of all forms of cooperation for the common good of people, planet, prosperity and peace." It brings together governments, bilateral and multilateral organizations, civil society, the private sector, as well as representatives of parliaments and trade unions, among others, seeking to strengthen the effectiveness of their partnership for development.

Revealing the essence of global partnership, it is worth deciding on the interpretation of these concepts. With the Merriam-Webster dictionary, the word "partnership" has several meanings, including: 1) scientists working in partnership with each other; 2) legal relations existing between two or more persons united by contract as joint principals in business; 3) persons united in a partnership; 4) relations that resemble a legal partnership and usually include close cooperation between parties that have defined joint rights and obligations (Partnership, 2022). Future plans for space exploration cannot be separated from earthly reality. The overall geopolitical context will change significantly in the next 20 years with new opportunities (as the growing number of space states, often with young populations in contrast to Europe's aging demographics, creates new viable partners with a well-educated scientific and technical workforce), but also new challenges (as challenging economic, energy, and environmental circumstances limit space budgets and direct governments' attention to more Earth-centric issues) (Nicolas, 2009).

The foreseeable future programs of space research, whether in the field of space exploration or Earth observation, are becoming more and more technically complex and so expensive that a single country can hardly afford to implement them. Joint space programs create links between industries and laboratories around the world, which are then developed in non-space activities that have a positive impact on the economy and scientific research. Strategies must be developed to mitigate the risks that are gradually increasing due to climate change. In order to lower the initial barrier to involvement in space, emerging and developing space nations should be included in joint space programs (Rosa et al., 2013; Soroka et al., 2019).

Accordingly, the global partnership is the latest framework for space exploration, consisting in the formation of a joint global strategy for space exploration and the implementation of joint innovative, open, interdisciplinary space exploration activities, which are built on the priority of peace and security, and serve to obtain equal opportunities to use of space resources.

Recent examples of global partnerships for space exploration

While science and technology are the foundation and often the driving force behind space exploration, some other disciplines and their stakeholders (Earth science, space law and others) need to be more strongly interconnected and involved than they have been until now. A shared vision is critical to this connection and to providing direction that will allow new countries and stakeholders to join and participate in the common space exploration effort. Building basic space technology capacity in more countries, ensuring responsible action by new space entrants, and increasing public awareness and involvement are concrete steps that can ensure greater interest in space exploration worldwide and create a strong foundation for the program's sustainability. By involving developing countries and emerging space powers in the international space exploration program, it will be possible to create a critical bottom-up support structure to support program continuity in the development and implementation of future global space exploration structures (Ehrenfreund et al., 2012).

Prospects for the development of the space industry are an urgent issue at the moment, as this industry is one of the important sectors of the high-tech market. The development of the space industry occupies a priority place in the economy of every state, achievements in this sector provide leadership positions in the international market of space technologies, and also add a certain weight to the issue of space development. This industry plays a key role in the implementation of international space projects. The primary source of innovation in today's world is science and technology, which contribute to productivity and economic growth. In recent decades, the space industry has been an engine for scientific research and advanced technologies applied in other sectors of human activity. At the same time, the space sector of the global economy demonstrates dynamic and stable development, which is associated with the processes of a powerful transfer of space technologies from the military sphere to the public sphere, and the development on this basis of a whole complex of commercial services related to the space industry and developments. For example, weather forecasting, global broadcasting and communication would not be possible today without the satellite industry. Now humanity is witnessing technological paradigm shifts not only in the space industry, but also in related areas. The consequence of this evolution is the functioning of space tourism, broadband network coverage and private space companies. All this, in general, contributes to the commercialization of the space industry and the rapid growth of the space industry, the development and implementation of space products, technologies and services, which in turn gives a powerful impetus to the strengthening of industry competition at various levels: global, interregional, interstate and national (Koshova, 2022).

The factor of competition between states took on a new form after the reformatting of the geopolitical map of the world. In such conditions, international cooperation became the most significant incentive (and also means) of space exploration. Today, space exploration involves close long-term cooperation between countries, which is both financial and political in nature. An example of the success of joint efforts is the International Space Station. The International Space Station has shown that international obligations can be fulfilled for decades under different governments. Today, space activity is undergoing a period of economic experimentation. One example of this is the development of new launch vehicles for future missions. If new missions bring economic benefits, then financial investments in the development of the latest launch vehicles will be justified and it will be concluded that space activities are profitable. Today, space activities are economically unprofitable, this is especially noticeable for countries that spend money on the "re-introduction" of old technologies (Atamanenko & Fedoniuk, 2014).

Future European and national space exploration programs and projects require new capabilities and scientific and technological solutions, and therefore external input into innovation. On the other hand, the key (industrial) regions of Europe are looking for innovation partners to strengthen their regional economy. In this context, the German company European Space Innovation AG (formerly Adam Alva Neil) – with extensive experience in convergence between space and other sectors – has developed a model of regional convergence platforms (called "Space Innovation"). These platforms are designed to facilitate technological partnerships between regional non-space and space sector (agencies/industry) companies and institutions. Within space agency programs (science, technology transfer, research, scientific and industrial use of the International Space Station), the private enterprise sector has gained significant status for this innovation process. Drivers of innovation in regional clusters or industry gain relevance as partners in the European innovation network (Bütfering, 2010).

Geopolitical developments combined with financial constraints have already shown that increased international cooperation will be important for future space exploration activities. Long-term human missions beyond low Earth orbit will be impossible with the resources of a single country. Space agencies around the world are now looking for a variety of partners as they plan their future endeavours. Thus, there will inevitably be opportunities for many countries to make significant contributions to the global program, as cooperation may occur at different stages of a space project (mission planning, mission development, mission operations, etc.) and may cover different activities, such as the exchange of scientific technical information (Nicolas, 2009).

The future viability of Europe's space program has reached a critical point and it needs to ensure that it is in the best possible shape to take advantage of the opportunities that exist. Europe will have to anticipate future changes in the geopolitical and space context and evolve if it is to maintain its position in the "space hierarchy." He must make choices about what areas of intelligence he wants to specialize in and decide who to work with, learning from past experiences and avoiding a situation where he is critically dependent on his partners (if there is no reciprocity). Leading intelligence in Europe will mean making difficult strategic decisions, decisions that will determine the direction, scope and size of the intelligence program in Europe for the next five to twenty years. They will affect both Europe's competitiveness in many fields of science and technology (S&T) and the attractiveness of its foreign policy (Nicolas, 2009).

The debate on future European space exploration strategies needs to be set in a wider geopolitical context and in a more dynamic forward-looking perspective.

Integrating key space portfolios into existing venues and agendas for bilateral consultation and decision-making has the potential to support the overall goal of further deepening political, economic, commercial, social and cultural relations. For example, in an era marked by significant international uncertainty, economic/financial tensions, and opposing political agendas, there are unexplored opportunities for space cooperation in the overall relationship between Europe and Japan. Indeed, the modalities by which Europe and Japan interact in space are likely to be one of the most important arenas for potential cooperation in the future. Space is a geopolitical bridge, and the bulk of space-related activity is international in one way or another. Although the two countries have a number of comparable launch vehicle programs and goals, relatively little effort has been made to promote increased cooperation between Europe and Japan at the governmental level as both sides have pursued autonomous capabilities. Industry has been at the forefront of promoting business relations between the two parties in the launcher sector (Robinson, 2012).

A rather interesting institutional transformation of the partnership in space research is the creation in 2021 of the National Space Partnership of Great Britain (The National Space Partnership – NSP) to develop space cooperation between government, academia and industry. The NSP is funded through an independent professional team to build trust in government, industry and academia through strong governance, strong confidentiality agreements and a clear purpose. It is equipped to engage diverse communities within the space sector and beyond to reach evidence-based consensus on a range of topics. The need for this type of organization is a recognized and valuable construct in the automotive and aerospace industries through the Advanced Propulsion Centre and the Aerospace Technology Institute, respectively. Creating a comparable model in the space sector to act as an independent thought leader will catalyse the creation of a portfolio of programs developed through active engagement. The NSP aims to build one of the most innovative and attractive space economies in the world to enable

the UK to develop as a space nation. It will protect the UK's interests in space, shape the space environment and use space to solve problems at home and abroad. Through cutting-edge research, it will inspire the next generation and keep the UK competitive in space science and technology (About, 2022).

The UK space sector is and will continue to be a UK success story. The National Space Strategy, published in September 2021, highlighted the importance of the space sector to the UK; not just for everyday life, but for the UK economy. Under the Space Strategy, the National Space Partnership will support space programs that focus on markets that can support and contribute to space development and broader market growth. He will provide leadership in supply chains, space science, finance, regulation and geopolitics. Equally important, his role is to engage with the entire space sector, supporting the UK's upgrade program to maximize collaboration and communication channels (Deliverables, 2022).

It should also be noted that the basis of global partnership is undoubtedly public-private partnership as a key component of stimulating innovation and national leadership. With the potential to address a wide range of modern challenges from technology development to infrastructure modernization and from education to economic space development, public-private partnerships are opening up new opportunities. The International Space Station National Laboratory is an excellent example of a public-private partnership model at work in space. The International Space Station National Laboratory opens the incredible opportunities of the space station's research environment to a variety of researchers, entrepreneurs and innovators who can create entirely new markets in space. The International Space Station National Laboratory has developed a successful Sponsored Program model, which leverages outside funding from private industry and other government agencies to solve big problems or targeted tasks. These programs are transformed into projects of the National Laboratory of the International Space Station. The Sponsored Program model allows an organization to ask new questions and explore key variables using the National Laboratory environment as a tool in its innovation portfolio. Instead, the organization creates opportunities for targeted research projects and STEM education projects or supports new ideas from start-up companies (Public-private, 2022).

During its fifty-ninth session in 2016, the Committee on the Peaceful Uses of Outer Space endorsed seven thematic priorities leading up to the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE+50). Among them was the direction "Global Partnership in Space Exploration and Innovation," which involved raising awareness of space exploration and innovation as an important driving force for opening new areas in space science and technology, launching new partnerships and developing opportunities that create new opportunities to solve global problems. Promote dialogue with cosmonautics and the private sector. Promote cooperation between space nations and developing space nations. The opportunity for space exploration to become open and inclusive on a global scale. Defining governance and cooperation mechanisms to support this goal (Report, 2022).

In general, it is possible to identify a positive trend in the formation of the foundations of a global partnership in the exploration of outer space, while, at the same time, an undeniably negative trend of focusing progressive space states on their own interests and ideas, with minimal involvement of developing countries. The main idea of global partnership is based on strategic principles of cooperation, dialogue and joint innovation.

Conclusions

A global partnership differs from a public-private partnership because it includes other principles that collectively define the role and purpose of such a partnership in outer space.

In our opinion, the newest dimension of global partnership as the basis of space exploration is based on the following principles:

1. Equality. Parties in the formation and implementation of programs must be equal, with the same level of responsibility. The demands of the parties must be accepted or some consensus must be reached. The essence of the global partnership is the unquestionable support and equality of the participants of global programs, it is the equality of the parties that distinguishes the global partnership from the public-private one. The involvement of developing countries and established space countries in the implementation of a single common goal in the field of space exploration without hierarchical bases will allow to really ensure the interests of all participants of global space programs.
2. Support and mutual assistance. Support and assistance to developing countries will form a better system of using space resources on a global scale.
3. Constructive criticism.
4. Interdisciplinarity.
5. Innovativeness.
6. Professionalism.
7. Priority of global security and peace.
8. Openness of activity for partners with the possibility of using monitoring.
9. Stable development.
10. Mutual benefit.

The newest dimension of the global partnership should bear the peaceful nature of space exploration, using all resources equally for each of the partners. Space and space objects cannot become the property or property of one entity, mankind must peacefully and safely explore outer space, coordinate its own actions and develop this coordination for the benefit of mankind.

In a global partnership, it is quite important to comprehensively use global digital governance for the development of global management of space research and the formation of a high-quality strategic relationship between partners for the study and development of outer space.

The latest dimension of global partnership should focus on involving the largest number of states, both progressive and developing, for the formation of international norm-setting for the study of outer space, the exchange of expert experience, the development of scientific platforms, and the guarantee of human safety during space exploration. At the same time, progressive countries should act as the main interested parties that should develop global partnerships, help and encourage developing countries.

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