

**INTERNATIONAL LEGAL PRINCIPLES OF SPACE AND  
ENVIRONMENTAL PROTECTION IN THE PROCESS OF SPACE  
EXPLORATION: NATIONAL IMPLEMENTATION AND AEROSPACE POLICY  
OF UZBEKISTAN**

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**Annotation:** *The article analyzes the international legal principles of space and environmental protection established by the UN treaties and modern initiatives in the field of sustainable space exploration. Special attention is paid to the issues of aerospace, innovative aspects of the development of space activities and environmental safety in the Republic of Uzbekistan. The legal foundations of the establishment and functioning of the Uzbekcosmos agency, its role in the implementation of state policy in the field of space, as well as the Samarqand-2028 hyperspectral satellite project as an example of the integration of science, ecology and international cooperation are considered.*

**Keywords:** *international space law, environmental protection, aerospace, sustainable development, Uzbekcosmos, Samarqand-2028 satellite, remote sensing of the Earth, Uzbekistan.*

#### Relevance of the topic

The development of aerospace and space technologies has become the most important area of scientific and technological progress of the 21st century. At the same time, space exploration entails environmental and legal challenges that require compliance with international standards for environmental protection and the prevention of pollution of the orbital space.

For Uzbekistan, which has a growing scientific potential, the development of the space industry is a strategic priority that contributes to ensuring food, environmental and national security. The state focuses on the legal regulation of space activities, the integration of international standards and the creation of an innovative infrastructure, which corresponds to the course of the President of the Republic of Uzbekistan on sustainable development and the "green economy".

#### The main part

International legal framework for the protection of space and the environment

International space law is formed based on UN acts:

- The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space (1967);
- The Convention on International Liability for Damage Caused by Space Objects (1972);
- The Convention on Registration of Objects Launched into Space (1975);
- The Agreement on the Rescue of Astronauts (1968).

These documents establish Basic principles:

- The use of outer space exclusively for peaceful purposes;
- State responsibility for damage caused in outer space and on Earth;
- Prevention of harmful pollution of outer space and Earth;
- International cooperation and exchange of scientific information.

Of particular importance is the principle of "due regard for the interests of other States", which prescribes not to cause damage to the space environment and ecosystems of the Earth.

Uzbekistan's National space strategy

In order to effectively realize the scientific and technical potential and use innovative space technologies in various sectors of the economy, on August 30, 2019, the Decree of the President of the Republic of Uzbekistan "On the development of space activities in the Republic of Uzbekistan" was signed. The Agency for Space Research and Technology (Uzbekkosmos Agency) was established on its basis.

The agency's main tasks include the development and implementation of State policy in the field of space research, as well as the improvement of legislation in the field of space activities, and the implementation of state control over the implementation of space law norms. Also, the development of infrastructure and research programs, the training and advanced training of specialists, including abroad, the promotion of commercialization and public-private partnerships and the promotion of international cooperation in the field of aerospace.

As a follow-up to the decree, the Roadmap for the development of the space industry in the Republic of Uzbekistan for 2019-2020 was approved, which provides:

- Formation of a legislative framework in the field of space activities;
- Development of ground-based space infrastructure;
- Creation of a personnel-training system;
- Expansion of international cooperation;
- Popularization of achievements of national space science.

Center for Space Monitoring and Geoinformation Technologies

In accordance with the Resolution of the Cabinet of Ministers dated May 20, 2022 "On measures to further improve the activities of the Space Research and Technology Agency", the Center for Space Monitoring and Geoinformation Technologies was established at the agency.

The main tasks of the Center include remote sensing of the Earth using satellite facilities, processing and transmitting space monitoring data, and providing services in the field of space activities. And also, the introduction of innovations and scientific

developments, increasing the efficiency of economic, defense and security sectors using geoinformation technologies.

The Center's activities ensure the practical implementation of the principles of environmental monitoring, emergency prevention and sustainable environmental management.

#### International cooperation and the Samarqand-2028 project

As part of the implementation of the Presidential Decree dated November 23, 2022 "On additional measures for the further development of the space industry," Uzbekistan has stepped up international partnership.

Of particular importance is the memorandum between the Uzbekcosmos agency and the Chinese company STAR.VISION on the creation of the Samarqand-2028 hyperspectral satellite, symbolizing the holding of the 2028 International Astronautical Congress in ancient Samarkand, the largest global forum to be held in Central Asia for the first time.

Uzbek specialists will develop the artificial intelligence module for the satellite. The data obtained will allow you to:

- monitor the quality of atmospheric air;
- Monitor agriculture and forests;
- assess the ecological condition of the territories;
- Promote digitalization and green economic reforms.

In accordance with the Decree of the President of the Republic of Uzbekistan dated November 23, 2022 "On additional measures for the further development of the space industry", the Agency for Space Research and Technology (Uzbekcosmos) It is defined as the coordinating body responsible for the formation and implementation of state policy in the field of space activities, the development of innovation, scientific research and international cooperation.

It should be noted that the Resolution is aimed at deepening Uzbekistan's integration into the global space community, expanding the practical application of satellite and geoinformation technologies in economics, agriculture, ecology, urban planning and security, creating a national space monitoring system to improve the efficiency of natural resource management and emergency prevention, as well as developing scientific, educational and human resources in the aerospace industry. the sphere.

The tasks of the Uzbekcosmos Agency within the framework of the Resolution are as follows, since the document specifies the agency's functions aimed at the systemic development of the industry, including:

1. Development of the national program "Cosmos–2030", which provides for the creation of a satellite cluster, the development of ground infrastructure and international partnerships.

2. Creation of a regulatory framework that ensures safety and legal responsibility during space missions, as well as the protection of Earth remote sensing data.

3. Support scientific research and innovative start-ups in the field of aerospace technologies.

4. Interdepartmental coordination in the use of space information by government authorities, scientific centers and businesses.

5. Commercialization of space activities is the creation of conditions for attracting private investment, developing public-private partnerships and forming a space market for services.

#### Personnel training and development of scientific and educational potential

The Resolution pays special attention to human capital as a key factor in the development of the space industry. The Agency has been instructed to:

- organize training, retraining and advanced training of personnel in the field of aerospace, satellite systems, geoinformation technologies, telecommunications and programming;
- establish cooperation with leading foreign universities (in particular, from China, Germany, France, Russia and Kazakhstan) for the exchange of experience and joint educational programs;
- Create a national school of aerospace technologies at Tashkent State Technical University and TSUE and other universities;
- Involve young scientists, postgraduates and students in research projects, stimulating the development of Russian space science.

#### Substantiation of the strategic importance of personnel policy

The development of the space industry requires a combination of technical, legal and managerial competencies. In this regard, the following are of particular relevance::

- Legal aspects of the regulation of aerospace activities, including responsibility for the use of orbital space and environmental protection;
- Interdisciplinary training of specialists combining engineering, environmental and legal education;
- Creation of a national personnel reserve in the field of aerospace management.

Personnel policy and training of specialists in the field of aerospace law and technology in Uzbekistan

In recent years, Uzbekistan has been actively developing a national system of training and retraining of personnel for the aerospace industry. In accordance with the Decree of the President of the Republic of Uzbekistan dated November 23, 2022 "On additional measures for the further development of the space industry", one of the key tasks of the Uzbekcosmos Agency is the development of human potential, training of highly qualified engineers, space system operators and specialists in international space law.

To achieve these goals, Uzbekcosmos develops partnerships with leading domestic and foreign universities. In particular,

- Agreements have been concluded with Tashkent University of Information Technologies named after Muhammad al-Khorazmi, Tashkent State Technical University named after I. Karimov, as well as a number of foreign educational institutions, including Beijing University of Aeronautics and Astronautics (Beihang University) and Moscow Aviation Institute (MAI);

- Joint internship and research project programs are being implemented with the European Space Agency (ESA) and organizations that are members of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS);

- Innovative remote sensing laboratories, space modeling centers, and educational startups aimed at popularizing aerospace sciences among young people are being created at universities in the country.

Special attention is paid to the legal field of space activities — a new segment of aerospace law is being formed, which combines international legal principles of space protection and national regulatory mechanisms.

Thus, the personnel strategy of the Uzbekcosmos Agency is a key element of the sustainable development of the industry. Trained specialists should not only have engineering and scientific knowledge, but also understand the international legal principles governing outer space and environmental protection.

International cooperation between Uzbekistan and the United States in the field of aerospace and environmental safety of space

In November 2025, during the meeting between President of the Republic of Uzbekistan Shavkat Mirziyoyev and President of the United States of America Joe Biden, held within the framework of the C5+1 summit in New York, one of the topics on the bilateral agenda was the deepening of cooperation in the field of innovation, high technology and space research.

During the negotiations, the parties expressed mutual interest in the development of the space industry in the Central Asian region and stressed the need to ensure environmental safety in the process of space exploration, which fully complies with the international legal principles enshrined in the:

- The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967);

- The Agreement on the Rescue of Astronauts and the Return of Objects Launched into Space (1968);

- Convention on International Liability for Damage Caused by Space Objects (1972).

The United States expressed its readiness to support institutional and educational cooperation with the Uzbekcosmos Agency, including in the field of hyperspectral remote sensing of the Earth, the development of AI modules for satellite systems, as well as in the field of aerospace law and sustainable development standards.

Special attention was paid to the training of Uzbek personnel in partnership with leading American universities such as MIT (Massachusetts Institute of Technology), California Institute of Technology (Caltech) and Georgetown University, where the possibility of exchange programs and internships for students and young professionals from Uzbekistan is being considered.

Thus, the meeting of the leaders of Uzbekistan and the United States in November 2025 marked a new stage in the formation of the international legal framework for cooperation in the space sector aimed at ensuring environmental and technological security, as well as the peaceful use of outer space for the sustainable development of the Central Asian region.

## CONCLUSION

The development of space activities in Uzbekistan is in line with the international principles of space and environmental protection enshrined in the UN treaties. The establishment of the Uzbekcosmos agency, the implementation of national programs and international projects such as Samarqand-2028 strengthen the country's scientific and legal positions in the global aerospace space.

In the future, the relevant direction is the development of the Law "On Space Activities of the Republic of Uzbekistan", which will combine issues of safety, ecology, innovation and responsibility in a single legal system.

## LIST OF LITERATURE:

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