MUNEA

UNOOSA

STUDY GUIDE

MUNEA

1. History of United Nations
    1.1. Foundation of United Nations
    1.2. United Nations Role in Outer Space

2. Introduction to UNOOSA
    2.1. Overview of the Committee
    2.2. History and Mandate
    2.3. Structure and Functions

3. Understanding the Agenda Topic(s)
    3.1. Background of the Issue
    3.2. Key Definitions and Terminology
    3.3. Current Situation and Recent Developments
    3.4. Relevant Case Studies
    3.5. Expectations from Delegates

4. Major Stakeholders
    4.1. Member States Involved
    4.2. International Organizations
    4.3. NGOs and Private Sector

5. Previous International Actions
    5.1. UN Resolutions and Treaties
    5.2. UNOOSA's Past Efforts
    5.3. Contributions by Other Bodies

6. Challenges and Controversies
    6.1. Legal and Ethical Issues
    6.2. Political and Economic Barriers
    6.3. Technological Constraints

7. Possible Solutions and Approaches
    7.1. Technological Innovations
    7.2. Policy Recommendations
    7.3. International Collaboration

8. Bloc Positions
    8.1. Western and Developed States
    8.2. Developing and Emerging Space Powers
    8.3. Non-Spacefaring Nations

Letter from the Secretary General

Esteemed participants,

I am honored to welcome you all here as the Secretary General of the first edition of MUNEA'25.

Our Academic team has created these guides to lead a pathway in your journey. They are meant to support your research and make your experience more productive, both during your sessions and throughout the conference. We will be inspired to closely watch your progress in the committees as both the Academic and Organization team.

In addition, I would like to extend my special thanks to my DSGs, Alp Arslan Şahin and Yağız Eren Şahin who helped me a lot and also tired me out. Even though we disagreed on most of the points we discussed, I am really proud of them.

As the Secretary General of the conference, and with our goal of contributing the development of a qualified Turkish youth, I wish all our participants, from first timers to experienced ones, a meaningful three-day journey in advancing their diplomatic skills and knowledge.

Letter from the Under Secretary General

Dear participants of Ankara Erman Ilıcak Science High School Model United Nations and United Nations Office for Outer Space Affairs,

With great humility, excitement and deep respect; I welcome you all to the United Nations Office for Outer Space Affairs, where the world unites to push the boundaries of human exploration and foster international cooperation beyond this planet of ours. Together, we shape the future of outer space for the benefit of all humankind.

My name is Ahmet Efe SARIKAVAK and I am a 10th grader at Ankara Erman Ilıcak Science High School. The committee UNOOSA holds a special place in my heart as it was the first General Assembly committee that I have been a part of and I have met some very incredible people there. As an enthusiast of the advancements in the field of outer space affairs, I am aware that the developments in this field are going to carve many unprecedented paths for further technological advancements and a further strengthened international cooperation is going to be to the benefit of all humankind.

I want to express my deepest gratitude to those who have made my MUN journey so special. My advisor, Vesile İspir Ünal, for guiding me into this incredible world; Ege and Tuna, for being the kind of friends who support me both in and outside of MUN; Yavuz, for standing by me and helping turn this committee into a reality; and Melis, for making this conference possible with her efforts. Your trust and friendship mean the world to me.

If you have any questions, please do not hesitate from reaching out to me

ahmetefesarikavak06@gmail.com

Ahmet Efe SARIKAVAK - Under Secretary General of UNOOSA

Letter from the Academic Assistant

Dear delegates.

As the Academic Assistant of the UNOOSA committee, it is my pleasure to express my greetings to all of you. My name is Yavuz Alper Şahin and I am a 10th grader. I'm honored to be a part of this prestigious conference, and I'm glad all our efforts worked out.

I would like to first thank my dear Secretary General, Melis Eda Yılmaz. She is a really hard working and incredible person. Also, thanks to my Deputy Secretary Generals Yağız Eren Şahin and Alp Arslan Şahin. I know how much they worked for this conference. Not to forget, my fellow Director General Tuna Akar and Deputy Director General Ege Ulubatlı Honestly, I saw how they worked day and night without complaining, with just pure productivity. And also, I want to express my deep thanks to my Under Secretary General, Ahmet Efe Sarıkavak. We worked hard to make this study guide together, he was always there when I needed him. It was honestly such a pleasure to work with him. And last but not least, thanks to my dear English teachers Aysun Akkan Memiş, Yasemen Erdoğan, and Vesile İspir Ünal. Our Model United Nations club started working last year and since then, we worked hard with our team to make the MUNEA'25 possible. Honestly, I'm just glad I met these people and I was on the same team with them.

Please do not hesitate to reach out to me if you have any questions. My Email is: sahinyavuzalper5@gmail.com and it is always open for your requests. We are here to ensure that your MUNEA'25 experience is pleasurable and rewarding. Welcome to MUNEA'25.

Sincerely, Yavuz Alper Şahin

Foundation of United Nations

After World War II, there was great devastation and loss. This led to the San Francisco Conference being held between 25th of April and 26th of June in 1945, with the collaboration of 51 states and resulting in the draft and signing of the UN Charter. The UN's actions were basically operating international cooperations to solve problems. These goals were mainly focused on ensuring fairness and equality between nations and states so that the future of mankind would be in peace and production.

The idea of formation of an international organizaton in order to keep peace wasn't entirely new. The League of Nations were meant to do so, providing peace and preventing future crises. But because of some weaknesses of the time, it failed and caused World War II. The formation of the UN however, is way more effective and sustainable because of stronger participations and structures. Over the course of years, the UN has developed significantly, as of 14th July 2011, it has 193 member states.

United Nation Role in Outer Space

The United Nations has played significant roles regarding outer space over the course of years. In the late fifties, it was clear that space exploration had great potential for countries. But this could very well turn into competition and conflicts rather than collaborations. Therefore, the UN formed the Committee on the Peaceful Uses of Outer Space (COPUOS) in 1959. This committee allowed countries to discuss and draft on topics such as international laws regarding space, keeping space for militarization and peaceful usage of space. The involvement of the UN helped ensure that space remains as a competition-free domain to this day.

To better support its mission, the United Nations Office for Outer Space Affairs (UNOOSA) was formed in 1962 by the UN. UNOOSA helps provide international cooperation in space operations and technical support to developing countries. UNOOSA

takes overvision of compliance with space treaties, including the Outer Space Treaty (1967). With all these efforts, the UN helps make the space explorations accessible to all countries, ensures collaboration over competition and aims to prevent harmful space activities that potentially can damage international relations; ultimately promoting the use of space for the benefit of humanity.

Introduction to UNOOSA

United Nations Office for Outer Space Affairs or UNOOSA in short is a United Nations subbody that aims to encourage peaceful utilization of outer space. Established in 1958, it encourages international cooperation in member states' space operations, establishes necessary frameworks and especially advocates for the space access of developing countries that do not fall under the category of "space-faring"

UNOOSA offers technical assistance to its member states, advocates for the demilitarization of space technologies and mainly aims to facilitate space research in developing countries, running various programmes for space awareness and informative collaboration.

Historical Context and Mandate

UNOOSA was established in 1958, in which the space race has begun, by an official decision by the United Nations General Assembly. The Sputnik Launched by the USSR in the same year has created the need for space law and ethical regulations. In this case, UNOOSA played a vital role in mediation and moderation of international space operations.

The UNOOSA mandate contains the peaceful usage of outer space, development of the international space law, limitation of militarization of outer space and the transparent registration of the actions of its member states in outer space. One of its most notable

achievements, the Outer Space Treaty, obliges the fair and peaceful utilization of outer space. The UNOOSA is responsible for the practice of these documents.

Structure and Functions

The UNOOSA's headquarters is located in Vienna, Austria and sustains its actions subordinated with the United Nations. The UNOOSA is most prominent as of the following:
Space Law: The UNOOSA plays a critical role in the establishment and implementation of space law. It has formulated various documents and treaties for sustenance of space operations under legal frameworks.
Technical Support and Capacity Expansions: Specifically to improve the space access of developing countries, it hosts training programmes, assemblies and technical assistance operations.
COPUOS: UNOOSA sustains the secretariat of the committee COUPOS (Committee on the Peaceful Uses of Outer Space). This committee handles discussions regarding the peaceful usage of outer space and space law debates through its subcommittees on a precise scale and develops new strategies.

Background of the Issue

Space has been the center of technological rivalry, scientific explorations and international power demonstrations since the cold war. The Space Age which had begun after the deployment of Sputnik 1 Satellite by the Russians marked a new era of politics and strategy. This development did not only push the USA, all the countries to commence investments into space and commence their space programmes.

During the 1950s and 1960s, the majority of investments towards space served military and strategic purposes. The USA and USSR have seen space as a platform to assert dominance in, establishing space systems for reconnaissance, development of nuclear arms transportation and communication control from space. This era is commonly referred to as the militarization of space.

However, various diplomatic efforts were prominent as well. The Outer Space Treaty signed in 1967 has mentioned that no state can assert domination over the Moon or any other celestial body. This treaty sets the basis for today's space law. Yet with the advancements made in technology, it is noted that this treaty remains outdated in many aspects.

By the end of the cold war, a more collaborative time has begun in space. The most prominent example of this is the construction of the International Space Station in 1998. Space agencies and countries such as the European Space Agency, NASA, Japan and Canada have strived for collaborative efforts and have made significant steps towards international usage of outer space.

The ISS has produced valuable outputs in many areas such as scientific research (microgravity experiments, astronomy, life sciences), technology tests and simulation of manned space missions. However, this cooperation structure has not been carried out under the umbrella of the United Nations; it has been shaped more based on the political and technical agreements of the parties. In addition, many countries - especially those in Africa, Latin America and Southeast Asia, have not been able to participate in this process. This situation has created a problem of inclusivity in space research.

In the beginning of the 21st century, a time called the "New Space Era" has begun. The most distinctive aspect of this era is that space operations are not only under member states, but private companies too. Companies such as SpaceX, Blue Origin, Rocket Lab, and

Virgin Galactic play leading roles in areas such as space tourism, satellite transportation, space mining, and Mars exploration programs.

These developments, despite seeming to democratize the usage of outer space, brought the commercialization of space and it being based on private ownership. This situation also causes an unfair competitive environment for developing countries, causing them to fall behind in space technologies. Additionally, the link between private companies and public agencies cause these companies to shape in accordance with national security policies rather than global public interest.

As we enter the second quarter of the 21st century, the development of space technologies have had newly emerging space faring states and private companies rather than a handful of selective countries. Therefore, a major part of space operations still revolve around national interests rather than international collaboration, which conventionally ignites geopolitical rivalries.

In this case, envisioned United Nations Led space operations may not only promote the research of scientific findings but also act as a meditative player between its member states, supporting peaceful collaboration and become prominent as a global effort stressing space developments in developing countries.

In history, steps taken with this agenda include the establishment of the International Space Operation or ISS in short, Global Earth Observation Systems and scientific forums around the COPUOS. However, many of these initiatives materialized with participation of only a limited number of countries or their coordinations have been regulated by a non governmental organisation. In this case, an operation directly led by the United Nations may offer a more inclusive and fair approach to space, possibly sowing the seeds for greater international projects for the benefit of humankind.

Key Definitions and Terminology

Space Operations: All activities conducted in space,satellite launches, reconnaissance missions, data collection, communications services, scientific experiments, etc. , are considered space operations. The focus here is that these operations serve scientific purposes and are independent of military or commercial competition.

International Scientific Cooperation: The joint production of knowledge by scientists and institutions from different countries through joint projects, information sharing, open data sharing, and joint experiments. This cooperation is particularly important in the field of space because space itself is beyond national borders.

United Nations Leadership (UN Leadership): This means that the UN not only provides a legal framework, but also assumes roles such as direct coordination, financing, expert guidance and facilitation of regulation. This structure can be taken as a guarantee of transparency and inclusiveness.

Capacity Building: The process of increasing the scientific and technical capacity of countries, especially low-income countries or those with limited access to space technologies. It is also one of the focal points of UNOOSA.

Current Situation and Recent Developments

In the current state of technology and advancements, approximately more than %80 of United Nations member states have ongoing space programmes. With the inclusion of private companies, this number greatly escalates. This diversity further notes the importance of international collaboration and data sharing. Especially, the following developments mark the importance of United Nations guidance.

Lack of Data sharing among countries: Space data obtained by developed countries often has limited access. This has had a negative impact on developing countries in areas such as disaster management, climate change monitoring or agricultural planning.
Space Debris Crisis: Unplanned launches and lack of international coordination have created a serious waste problem in orbit. This issue can only be solved through global coordination.
Risk of Militarization: Anti-satellite weapon tests by some countries have raised serious concerns about the security of space. UN-led civil and scientific operations could offer an alternative to such trends.

The United Nations Office for Outer Space Affairs (UNOOSA) currently carries out various scientific programs. In particular:

UN-SPIDER: Enables the use of satellite data in combating natural disasters. Technical assistance has been provided to many developing countries under this program.

Access to Space for All: Provides technical support and launch opportunities to countries wishing to develop small satellites.

Global Forum on Space Law: Provides guidance for the development of space law and for countries to act in accordance with international standards.

However, all these efforts are still carried out in a fragmented and project-based manner. The need for a comprehensive and sustained UN-led space operation is therefore becoming increasingly evident.

Relevant Case Studies

Space operations that serve the purpose of international scientific collaboration were carried out on a variety of platforms and these previous operations serve as important milestones and references for envisioned United Nations led space operations. In further parts of this article, 4 main international projects in this context will be advanced in detail. These projects being: the International Space Station, Copernicus Programme, Artemis Accords and BRICS Space Cooperation.

International Space Station

Founding Year: 1998

Partners: NASA (USA), Roscosmos (Russia), ESA (European Space Agency), JAXA (Japan), CSA (Canada)

Purpose: To establish a permanent scientific laboratory and joint research platform in space.

The International Space Station is the most inclusive and long lasting international space project in the history of humankind. Countries with different cultures, technologies and management systems have been cooperating for years on the financing, construction, maintenance and operations of this orbiting structure. In the context of this project, hundreds of microgravity experiments have been carried out; and a great amount of groundbreaking advancements in the field of biology, medicine, physique and metallurgy have been made.

Elements to note for United Nations Led Space Operations

The International Space Station despite being sustained on an international basis, the fact that the project was not carried out under the auspices of the UN prevented developing countries from participating in the process. This situation has led to criticism that the science represented by the ISS is not global but rather limited to the interests of technologically advanced countries.

Copernicus Programme

Start Year: 2014

Executive Agencies: European Commission, European Space Agency (ESA), EUMETSAT

Purpose: To contribute to environmental monitoring, disaster management, security and climate research by collecting Earth observation data.

The Copernicus Programme is one of the most prestigious and inclusive space based observation programmes. The Sentinel satellites developed within the scope of the program provide high-resolution images and provide data in areas such as agriculture, forest fires, marine pollution, water resources and air pollution.

The most eye-catching element is that the Copernicus Programme is sustained through an Open Data Policy. Every country, institution or individual may utilize the received data for scientific, commercial or social purposes.

Elements to note for United Nations Led Space Operations

An envisioned United Nations led space operation may take the Open Data Policy of the Copernicus Programme as a basis. Through an Open Data Policy, developing countries may engage in scientific analysis activities without undergoing the hefty cost of developing satellite technologies. It should be noted that the heavy costs of developing space related technologies for the developing countries is a problem to be tackled, to compensate and sustain our agenda item.

Artemis Accords

Founding Year: 2020

Initiator: NASA

Partners: US, Canada, Japan, Australia, UK, South Korea, Brazil and 20+ other countries

Purpose: To establish principles for international cooperation on Moon and Mars missions.

The Artemis Accords are a multilateral consensus that aims to outline the legal framework for NASA's plans for a human return to the Moon. The agreements set forth principles on issues such as resource extraction, space property rights, mission transparency and data sharing. However, the consensus was shaped outside the United Nations system, largely under the leadership of the United States.

Elements to note for United Nations Led Space Operations

The Accords underwent heavy criticism because of various contradictions with United Nations Space Law, being excluded by major actors in space such as Russia and China. This

situation could cause Artemis to have global legitimacy problems in the long run. A scientific operation led by the UN may provide an opportunity to shape Artemis-like principles on a more inclusive and universal basis.

BRICS Space Cooperation

Founding Year: 2009

Partners: Brazil, Russia, India, China, South Africa

Purpose: To facilitate strategic cooperation and data sharing in space among developing countries.

BRICS members established regional cooperative unions to further stress the prominence of developing nations' economies in the field of space. For instance, the BRICS Remote Sensing Satellite Constellation has been developed to provide useful data in fields such as agriculture, natural disaster management and climate change. Countries have integrated their own satellites into this constellation and established common data sharing protocols.

Elements to note for United Nations Led Space Operations

BRICS cooperation is important in that it shows that developing countries can establish solidarity among themselves. However, this cooperation has a limited geographical scope and lacks a neutral structure like the UN. In addition, some projects may be hampered due to technological and political differences. Global scientific space operations to be developed under the leadership of the UN can be a point of convergence for such regional initiatives.

Summary and Evaluation

Case Study Project: ISS

Main Participants: USA, Russia, ESA, Japan, Canada

Benefits: Comprehensive scientific cooperation

Limitations: Outside UN framework, limited inclusion

Case Study Project: Copernicus

Main Participants: EU countries, ESA

Benefits: Open data sharing

Limitations: EU-centric, limited participation

Case Study Project: Artemis Accords

Main Participants: 20+ countries led by the USA

Benefits: Legal framework for lunar missions

Limitations: Outside UN, polarizing structure

Case Study Project: BRICS Cooperation

Main Participants: Brazil, Russia, India, China, South Africa

Benefits: Capacity building for developing countries

Limitations: Limited inclusiveness, political disparities

These examples, with both their successful and problematic aspects, are important reference points for the UN-led Space Scientific Operations that the UN will establish in the future. While transparency, data sharing and open science principles stand out in successful collaborations, elements such as limited participation, political conflicts and lack of inclusiveness stand out in failures.

Expectations from Delegates

Delegates are expected to develop innovative, sustainable and inclusive solution proposals for a new global mechanism to be carried out under the leadership of the United Nations, based on past examples in the field of international space cooperation.

It is important to develop models that combine the strengths of these initiatives, especially considering the successes and limitations of examples such as the ISS, Copernicus, Artemis Accords and the BRICS Space Cooperation, while minimizing exclusivity, polarization and regional centralization.

Delegates should accurately reflect both the scientific and diplomatic capacity of the country they represent and exhibit approaches that consider not only national interests but also the common good of humanity. In addition, they are expected to produce applicable policies on topics such as space research, data sharing, security, ethical frameworks and inclusive governance.

Finally, draft resolutions must take into account the technical adequacy as well as the legal and institutional infrastructure appropriate to the United Nations system. The active participation of delegates, their openness to cooperation and their pragmatic balance in their proposals will be critical to the effectiveness of this committee.

Major Stakeholders

Member States Involved

The United Nations includes many member states which play active roles in space. These countries are generally the ones that have developed their space agencies or the ones that contribute and give importance to space explorations. Besides this, developing countries also take part in space explorations to benefit from scientific cooperation and develop capacities. Member states play an important role in shaping the agenda item by cooperating in fields such as data sharing, common tasks, and global space governance.

United States (NASA): National Aeronautics and Space Administration, NASA in short, is in the global leader position in manned and unmanned space operations. It contributes to international cooperation significantly through its fully developed technological infrastructures and scientific data provision.

Russia (Roscosmos): Roscosmos is known for its years of experience in manned space flights and space stations. It stands out as a reliable partner in international duties. China (CNSA): China National Space Administration stands out with its fast-increasing capacity over the last few years. It has developed its own space station and executed space missions over the Moon and Mars.

India (ISRO): The Indian Space Research Organization is known for its low-cost and effective space missions. It promotes collaboration in scientific research and capacity-building fields.

Japan (JAXA): Japan Aerospace Exploration Agency specializes in especially robotic explorations, asteroid missions, and scientific satellite buildings.

European Countries (ESA): The European Space Agency connects many countries' scientific and economic resources through its multinational structure. It strengthens global collaborations with its common missions and long-term research projects such as ExoMars.

International Organizations

International organizations play a significant role in space practices and scientific cooperation. Especially our committee, UNOOSA, is a central actor in terms of the peaceful use of space and the implication of space missions that make history. Apart from that, international organizations such as the European Space Agency (ESA), the International Telecommunication Union (ITU), and the Group on Earth Observations (GEO) help with scientific data provision, satellite coordination, and sustainable development. These establishments help facilitate international technical collaboration and set standards. The provision of technical support and education to developed countries with the help of international organizations holds great importance.

International Telecommunication Union (ITU): ITU coordinates frequency adjustions of space communications and orbit allocations. It plays a key role in setting technical standards for satellite communication.

Group on Earth Observations (GEO): Geo encourages data sharing in fields like agriculture, environment, and disaster management by uniting countries and organizations that observe the globe. It aims to use the data acquired from space for the benefit of the global public.

NGOs and Private Sector

NGOs and the private sector get more voice day by day. Especially the investments in space technologies done by private companies over the last years increased scientific collaboration opportunities. Companies like SpaceX, Blue Origin, Planet Labs, and Rocket Lab play active roles in both takeoff technologies and data provision. The technical capacity and the knowledge accumulation of NGOs have critical importance for the success of UN-led scientific cooperation attempts. The inclusion of these actors will help provide a more inclusive and sustainable space governance.

Previous International Actions

United Nations Resolutions and Treaties

International space law and the peaceful use of space activities have been shaped by resolutions and multilateral treaties developed through the United Nations (UN) and especially the United Nations Outer Space Office (UNOOSA) since the mid-20th century.

Outer Space Treaty (1967)

The Outer Space Treaty, which entered into force in 1967, forms the basis of international space law. This document stipulates that space can only be used for peaceful purposes and that no state can claim sovereignty over the Moon or other celestial bodies. It also prohibits the placement of nuclear weapons in space. This treaty has established the idea that space is the common heritage of mankind on a legal basis.

Rescue Agreement (1968)

This agreement gives states the obligation to rescue and provide assistance to astronauts working in space in case of any danger. It also foresees that spacecraft that fall to the surface of the Earth will be returned to the original owner state.

Space Liability Convention (1972)

This convention regulates the legal and financial liability that will occur in the event that a country causes harm to another country due to activities carried out in space. It is a critical reference point for issues such as space debris and collisions, which are becoming more important today.

Registration Convention (1976)

Each state is obliged to register the spacecraft it launches with UNOOSA. This is an important step in terms of transparency and traceability in space.

Moon Agreement (1979)

This agreement, which advocates that the resources of the Moon and other celestial bodies can only be used for the sake of all humanity, has been ratified by only a limited

number of countries today. The fact that space powers such as the USA, Russia and China are not parties to this agreement has reduced the effectiveness of the text.

UNOOSA's Past Efforts

The United Nations Outer Space Office (UNOOSA) has undertaken many initiatives to ensure the peaceful use of space, globalize access to space technologies and ensure that space activities are carried out in accordance with international law.

COPUOS (Committee on the Peaceful Uses of Outer Space)

Established in 1959, the Committee on the Peaceful Uses of Outer Space (COPUOS) is the primary advisory body of UNOOSA. This committee has played a leading role in the development of international norms related to space. Member states share information, propose guiding principles and develop non-binding rules of practice through this structure.

UN-SPIDER (United Nations Platform for Space-based Information for Disaster Management and Emergency Response)

The UN-SPIDER program promotes the use of space-based information in disaster management and emergency response processes. Sharing satellite data with developing countries is one of the main goals of this program.

Space4Women and Access to Space for All

UNOOSA's Space4Women initiative was developed to ensure gender equality in the space sector and increase the role of women in space. The Access to Space for All program aims to increase the access of developing countries to space technologies and orbit. These efforts are considered concrete steps towards reducing inequality of opportunity in space.

Space Objects Database (Online Index of Space Objects)

This database, managed by UNOOSA, keeps track of all vehicles launched into space. This system, which includes information such as launch date, owner country, and mission type, facilitates traceability and responsibility determination of activities in space.

Contributions by Other Bodies

Apart from UNOOSA, some regional and national institutions have also made significant contributions to the organization, management and scientific cooperation of space. The contributions of these structures can form a model for the United Nations-led global space operations system that UNOOSA aims to establish in the future.

European Space Agency (ESA)

ESA was established in 1975 and coordinates the space activities of 22 countries in Europe. ESA actively contributes to international projects (such as the ISS) and also manages its own satellites (such as Copernicus) for scientific data sharing.

BRICS Space Collaborations

BRICS countries, consisting of Brazil, Russia, India, China and South Africa, cooperate in areas such as joint space mission plans, satellite launch collaborations and technology transfer. This structure offers an alternative space cooperation model among developing countries.

African Space Agency and ASEAN Space Efforts

The African Space Agency (AfSA), established by the African Union, aims to coordinate space activities across the continent. Similarly, ASEAN countries have established

technical forums and common data systems to develop regional space policies. These regional initiatives complement UNOOSA's global efforts.

Challenges and Controversies

Legal and Ethical Issues

The current legal system that determines the framework of international space activities is inadequate to keep up with the pace of technological developments. Although the principle of peaceful use of outer space is included in the 1967 Outer Space Treaty, there are serious legal and ethical uncertainties about how this principle will be applied to today's complex space operations.

Legal Gaps

The Outer Space Treaty has left many areas open-ended regarding sovereignty violations, military use, and private sector activities. For example, according to the treaty, it is not possible to claim ownership over the Moon and other celestial bodies. However, space mining activities carried out by private companies push the boundaries of this rule.

Similarly, although the Moon Treaty claims that resources are the "common heritage of mankind," it remains ineffective because the major space powers have not accepted this agreement. This situation creates a serious normative gap regarding the ownership of space resources.

Ethical Concerns

The fact that activities in space are carried out only by developed countries and companies leads to criticisms of space inequality and technological colonialism. Developing

countries face serious structural obstacles to accessing space and are often excluded from decision-making processes.

In addition, issues such as militarization of space, use of nuclear energy, and the surveillance capacity of artificial intelligence-supported satellites are highly controversial from an ethical perspective. In particular, systems called “dual-use technologies” that can be used for both civilian and military purposes undermine the principle of transparency.

Political and Economic Barriers

Another important obstacle to international space cooperation is the geopolitical tensions and economic interest conflicts between the space policies of major states.

Sovereignty-Based Competition

The race of countries such as the US, China and Russia to increase their activities in space slows down the development of multilateral cooperation mechanisms. In particular, the exclusionary evaluation of non-UN initiatives such as the Artemis Accords by other actors causes blocs.

The Tiangong Space Station project carried out by China or the independent Moon missions proposed by Russia are seen as an alternative to the cooperation structure established by Western countries via the ISS. Such mutual distrust makes it difficult to reach an agreement on issues such as common data sharing, resource governance and emergency coordination.

Economic Access Gaps

Since space activities require high-cost infrastructure, advanced technology, and expertise, developing countries have very limited opportunities in this area. There is asymmetric access to basic services such as placing satellites in orbit, remote sensing, or access to global navigation systems.

Although efforts such as the United Nations' "Access to Space for All" program aim to reduce this inequality, economic interests often become obstacles to cooperation as private sector investments increase. The process of commercialization of space leads to the prominence of private interests rather than public benefits.

In addition, underdeveloped countries participate in international space-related forums with limited resources and representative power, and are often forced to passively comply with decisions. This situation also brings with it the problem of representation inequality.

Technological Constraints

One of the most tangible obstacles to space activities is the imbalances in technological competence and infrastructure deficiencies.

Many countries do not have the infrastructure elements such as launch facilities, ground stations, and mission control centers required to carry out space missions. Such investments require large costs and are generally not shared with other countries for national security reasons.

In addition, issues such as spectrum allocation, orbital traffic management, and space situational awareness can only be managed healthily with systems that require high technology. This limits the capacity of small states in particular to safely launch and operate their own satellites.

Technological Dependence and Digital Divide

Developing countries are often dependent on external sources for space technologies. This situation creates strategic risks in terms of both national security and sustainable development goals. In addition, due to the digital divide, it is becoming difficult to analyze space data, transform it into meaningful policy, and transform it into social benefit.

Many countries are only consumers of the space data produced, and cannot become producers and developers. This situation causes scientific sovereignty to be in the hands of only a few countries.

Security and Cyber Threats (Cybersecurity and Operational Risks)

The vulnerability of space systems to cyberattacks is an important risk area that can weaken international cooperation. Cyber threats, especially against commercial satellites, navigation systems, and military systems, have become the biggest security problem of new generation space operations.

In addition, with the increase in objects in orbit, space debris poses serious operational risks. Any collision can cause chain reactions (Kessler Syndrome) and render the entire orbital system dysfunctional.

Possible Solutions and Approaches

Today's rapidly evolving space environment has become so complex that it can be managed not only by individual national policies but also by comprehensive international cooperation and multidimensional strategies. In this context, technology-based solutions, policy reforms and international mechanisms are of vital importance both to close the existing gaps and to establish a sustainable structure for the future.

Technological Innovations

Strengthening space cooperation should be supported not only by political will but also by concrete technological solutions. Technological innovations can facilitate not only the success of missions but also equitable participation, resource management and data sharing.

Open-source Systems and Shared Infrastructures

In order to facilitate the participation of developing countries in space missions, structures such as open-source software, low-cost satellite platforms and shared ground stations should be promoted.

Such technologies not only democratize access to information but also reduce standardization and interoperability problems. An "Open Space Innovation Platform" to be developed under the auspices of the United Nations could facilitate resource sharing and real-time data collaboration among countries.

Small Satellites and CubeSats

Small satellites and CubeSat technologies accelerate the commercialization of space activities and provide an entry point for countries with smaller budgets. In international scientific missions, CubeSat projects that will be jointly developed by multinational teams can increase technical cooperation between students and scientists. Such projects create an environment of cooperation both in educational and diplomatic dimensions and allow young experts to contribute to the global space vision.

Space Traffic and Debris Management Systems

The increasing number of objects in space has become not only an operational but also a diplomatic threat. Space Traffic Management (STM) systems to be developed at the

international level can make launch and orbit coordination transparent and accessible. Additionally, the safety of future missions could be increased through space debris mitigation technologies—for example, magnetic capture systems, laser homing, or passive deorbit devices.

Policy Recommendations

Technological developments can only gain meaning through the political framework that guides and regulates them. Therefore, comprehensive and applicable policy proposals that will strengthen international space cooperation are necessary.

Updated International Legal Framework

Updating existing international agreements (especially the Outer Space Treaty) or creating new binding documents is critical to avoid legal uncertainties. For example:

- Principle of equitable benefit-sharing in the use of space resources,
- International regulatory standards for commercial space companies,
- Transparency and verification mechanisms should be established for military activities.

In addition, revising documents that have been accepted by a small number of countries, such as the Moon Agreement, and making them more comprehensive can address normative gaps.

Proposal for an International Space Agency

Under the supervision of the United Nations, it may be suggested to strengthen the existing UNOOSA structure or to establish a new International Space Agency parallel to it, which will include representatives of states and the private sector. This structure can:

- Develop joint research programs,
- Coordinate satellite data sharing platforms,
- Direct education and capacity building funds.
- Such a structure will directly contribute to reducing technological imbalances between countries.

Financial Mechanisms for Space Access

Special grant programs can be established through UN funds, development agencies and regional unions to enable low-income and developing countries to play a more active role in the space field. These funds, themed “Space for Development”, can be used for scientific research, educational scholarships and infrastructure investments.

International Collaboration Models

Effective global space management is possible not only with inter-state but also multi-stakeholder cooperation. Scientists, universities, private sector and NGOs should also be included in this process.

Scientific Consortiums and Joint Missions

A CERN-like structure can be used as a model to establish scientific consortia between countries for specific tasks. For example, it can be suggested to establish a “Global Climate Monitoring Satellite Network” to monitor climate change. In this network, different

countries contribute satellites, software, data analysis teams or funding. In this way, the mission is integrated around a common scientific goal.

Education and Capacity-Building Initiatives

Based on UNOOSA's "Access to Space for All" program, regional education centers (Regional Centers for Space Science and Technology Education) should be expanded and specialization in areas such as advanced engineering, data science, and orbital mechanics should be provided in these centers. In addition, online open course platforms (MOOCs) can make it easier for young scientists and public officials to catch up with developments in the space field. Prioritizing women and underrepresented groups in these programs creates a more inclusive cooperation environment.

Transparency and Confidence-Building Measures

The following mechanisms can be suggested to establish trust between countries:

- Pre-launch notifications of satellite missions and orbital plans,
- Shared orbital data repositories,
- Interoperability exercises for exercises and crisis scenarios.

Such measures could alleviate concerns, particularly about security and the separation of civilians and military personnel.

The solutions presented in the fields of technology, politics and international cooperation aim to overcome current challenges and preserve space as a sustainable area for humanity. Delegates are expected to consider these multidimensional approaches and take into account not only technical but also ethical and social impacts when proposing solutions.

Bloc Positions

Western and Developed States

Western and developed states, generally, are the pioneers, and they have advanced space agencies and technological infrastructures. While these countries support scientific collaboration, they also move in favor of their strategic benefits. Countries such as the USA, Canada, European countries, and Japan play active roles in international space operations regarding data provision, setting standards, and multilateral projects. These countries generally find the scientific collaborations led by the UN favorable but ask for the projects to be appropriate to their security and property policies. Also, in these countries where the private sector is powerful, public-private collaborations are in the foreground.

Developing and Emerging Space Powers

Developing and emerging space powers gradually gain more influence on space research and scientific cooperation. These countries have created their own space agencies and built scientific capacity by investing in space technologies. Countries like China, India, Brazil, South Korea, and the United Arab Emirates have made significant progress in space exploration and satellite technologies. These countries aim to increase their contribution to the UN-led space cooperation and have more influence on global space governance. Developing space powers, asking for equal opportunities in space research, and especially looking for more cooperation for capacity building and technological transferring.

Non-Space Faring Nations

The countries that have limited participation in space operations and haven't developed their space agencies and space technologies yet play more passive roles in

scientific cooperation. These countries usually benefit directly from space research but have limited infrastructures regarding space exploration and technologies. These countries ask for more capacity building, education, and technical support. Also, for these countries, peaceful cooperation in space and the provision of equal opportunities with countries with advanced space power hold great importance. These countries usually aspire to be a part of programs that are about the sharing of space technologies and scientific data.

Questions to be Considered

What should be the legal basis for a space operation led by the United Nations?

How can international scientific cooperation be achieved without creating an imbalance in favor of technologically advanced countries?

How should data and intellectual property rights for scientific studies to be conducted in space be shared among countries?

How should these operations be financed and their sustainability ensured?

How can developing countries' access to and contributions to projects be supported?

What should be the position of the private sector and commercial actors in space operations?

How should technical details such as planning joint missions and sharing orbits be coordinated?

Key Terms and Glossary

Outer Space: The area of space that is outside of the Earth's atmosphere and where space activities happen.

Spacefaring Nation: The type of country that can send spacecraft to space and facilitate space activities.

Scientific Cooperation: The scientific collaboration that is made with international information, technology, and data sharing.

Space Operation: The activities that are facilitated in space with technical, scientific, or exploration goals.

Scientific Payload: The equipment that is transferred to spacecraft and used to collect scientific data.

Space Law: International rules of law that regulate space activities.

Dual Use Technology: The type of space technologies that are usable for both civil and military goals.

The Outer Space Treaty (1967): The international agreement that regulates the peaceful use of space and the responsibilities of countries.

Capacity Building: Space technic and institutional capacity achievement of developing countries.

Space Governance: The system that is created to regulate and manage space activities.

References and Further Reading

1. United Nations Office for Outer Space Affairs (UNOOSA) –

Official UNOOSA website containing comprehensive information on its mandate, programs, and legal documents.

https://www.unoosa.org

2. Treaties and Principles on Outer Space –

A collection of all major UN treaties and agreements governing outer space activities.

https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html

3. The Artemis Accords – NASA –

NASA's official documentation and signatory list for the Artemis Accords.

https://www.nasa.gov/artemisaccords

4. European Space Agency (ESA) – Copernicus Programme –

A major Earth observation initiative offering open-access satellite data for environmental monitoring.

https://www.copernicus.eu/en

5. BRICS Remote Sensing Satellite Constellation –

Official statements and updates regarding the BRICS space collaboration efforts.

https://brics-info.org (Note: May vary depending on latest publications)

6. Access to Space for All – UNOOSA Programme –

UNOOSA's initiative to promote equal access to space technologies and launch opportunities.

https://www.unoosa.org/oosa/en/ourwork/access2space4all/index.html

7. UN-SPIDER Programme –

Space-based information for disaster management and emergency response.

https://www.un-spider.org

8. Space Law and Policy Resources – Secure World Foundation –

Reports and whitepapers on legal, ethical and strategic frameworks for outer space.

https://swfound.org