Topic 2: Establishing Legal Frameworks for Space Mining and Extraterrestrial Resource Exploitation

United Nations General Assembly

I. Introduction

Space Mining and Extraterrestrial Resource Exploitation involves extracting valuable resources from celestial bodies for space exploration or for utility on Earth. Celestial bodies include moons, planets and asteroids. This provides us with the potential for further space exploration as well as a sustainable source of rare minerals and elements. This mainly encompasses gases like Helium-3 which is one of the main sources for nuclear fusion research Near-Earth Objects. The practice of space mining and the usage of such resources raises significant questions about whether it is permitted under existing international law and if private entities and governments can assert their property rights over them.

Rapid advances in technologies involving spacecraft and artificial intelligence make this issue extremely relevant to today. Private companies such as AstroForge, which launched its Odin spacecraft to conduct some asteroid mining methods in 2025, and governments are becoming increasingly enthusiastic to make use of these resources in order to develop the global space economy, collect space data and develop new industries and infrastructure.

Even though it could be argued that these developments are relatively new, establishing a legal framework and guidelines to support a diplomatic and conflict free resource management of extraterrestrial bodies is of utmost importance.

II. Key Terms

Space Mining - The process of finding and extracting resources from celestial bodies like the Moon, asteroids and other planets.

Extraterrestrial Resource Exploitation - Refers to materials and minerals sourced from outside earth.

Near-Earth Objects (NEOs) - Objects close to earth's that have been pulled by gravity to its orbit such as asteroids and comets.

UNOOSA The Outer Space Treaty - Agreement adopted by the UN General Assembly in 1966 of basic principles involving international space exploration. No country can claim sovereignty over celestial bodies and resources can only be used for the benefit of humankind.

UNCOPUOS - United Nations Committee on the Peaceful Uses of Outer Space - Established Five Treaties and Principles regarding the exploration of space and the use of its resources such as the Outer Space Treaty.

In-Situ Resource Utilization (ISRU) - Harnessing of local natural resources on other celestial bodies like Mars and the Moon (mission destinations) to support robotic and human space exploration instead of taking all supplies needed from earth.

Regolith - Fragmented and loose rock material that covers the bedrock on a planet or the moon

Volatiles - Substances or chemical compounds that easily turn into a gas or vaporise.

III. Past International Actions

UNCOPUOS - United Nations Committee on the Peaceful Uses of Outer Space:

Set up in 1959 to govern the use and exploration of space for the security, development and peace of all of humanity. It is used to review international cooperation in peaceful uses of outer space and studying space-related activities that could be undertaken as well as methods to reach global development goals. This was essential in the creation of the five treaties and principles of outer space. Established after the launching of the first artificial satellite, it was composed of 18 members which grew into 24 when it was established as a permanent body. Its work is also assisted by two sub-committees.

5 Treaties:

The "Outer Space Treaty" - 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 "Rescue Agreement" - Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (1968)

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

The "Registration Convention" - Convention on Registration of Objects Launched into Outer Space (1976)

The "Moon Agreement" - Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1984)

(Dates refer to when these treaties were entered into force)

5 Principles:

The "Declaration of Legal Principles" - Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space (1963)

The "Broadcasting Principles" - The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (1982)

The "Remote Sensing Principles" - The Principles Relating to Remote Sensing of the Earth from Outer Space (1986)
The "Nuclear Power Sources" Principles - The Principles Relevant to the Use of Nuclear Power Sources in Outer Space (1992)
The "Benefits Declaration" - The Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (1996)

These treaties and principles were implemented to ensure the responsible and safe usage of space resources by all states by establishing that no state can claim ownership over any celestial body and that all efforts going into the exploration of space should be for the wellbeing and benefit of humankind only. The collection of information and data from multiple states was done to ensure the exchange of it between them to promote and foster international collaboration in this matter.

IV. Timeline of Key Events

1959	Establishment of UNCOPUOS (United Nations Committee on the Peaceful Uses of Outer Space)
1967	Outer Space Treaty outlines principles for Space
1979	Moon Agreement – “common heritage of mankind” and prohibits appropriation
2015	US Companies can now explore and exploit space resources as ownership granted over resources extracted (without claiming sovereignty of celestial bodies)
2017	Luxembourg - Companies granted rights to resources
2020	Artemis records

2022	UN COPUOS - Working group on legal aspects of Space Resource Activity
2024	EU Space Act - Space mining left to member states but working on common set of rules for how space activities are approved

V. Current Situation

The mining of NEO and the moon are expected to become a key aspect of commercialisation of space meaning that we are faced with the question of how best to regulate future extraction and exploration. The moon agreement was an effort by UNOOSA to ratify the statements made in the OST however it is not seen as enforceable in international law. Only 17 nations have ratified their agreement. Countries like Luxembourg and the United States have approved legislation that authorizes activities like resource ownership and extraction.

Currently, the question about who should make these decisions, nations themselves or the Committee is still being discussed. There have been suggestions to adapt the OST as it was created 50 years ago and did not take into account space mining. Without regulation some countries will be at an advantage which could lead to monopolies, environmental instability and more.

Ultimately, extraterrestrial technology and privatisation permits are developing at a rapid pace and discussion about how to create a legal and ethical environment for nations fails to keep up.

VI. Major Parties Involved

Luxembourg: Luxembourg has taken various actions to become Europe's Space mining hub. It has an enduring space industry and being one of Europe's wealthiest countries it is essential in the development of satellite communications.

They opened a $238 million line of credit for entrepreneurial space companies to set up their headquarters. To boost commercial utilisation and exploration it created its own Space Agency (LSA).

United States: The United States has been crucial in the evolution of space exploration and mining and was a signatory to the Outer Space Treaty in 1963. It initiated several projects during the Space Race and successfully landed the first humans on the moon. In 2020 NASA in collaboration with the US Department of State introduced the Artemis Accords which are a common set of principles to enhance the governance of civil exploration and the use of outer space. This has been signed by 56 nations today. The United States however, did not sign the Moon Treaty (1979) which stipulates that any activities in space should conform to international law.

Russia: Russia has been pursuing plans in recent years to return to the moon. The plan to establish a long-term base on the moon was revealed in 2018 as well as a mission to mars. It has had a historical leadership in space exploration with the launching of the first satellite, Sputnik and it's space program which enabled us to know further about outer space.

United Nations: The United Nations is essential as it provides a space of international collaboration in which treaties and principles can be created. It makes sure to set ethical standards and a fair legal framework that permits us to utilise space resources responsibly as well as manage resource extraction. Without some treaties like the OST conflict and disputes could arise between nations over property rights in addition to access.

VII. Key topics to Debate

- Interpretation of the outer Space Treaty - Does the prohibition of national appropriation outstretch the private ownership of resources?
- Should an organisation or body be created in order to regulate space mining and other exploration activities?

- What laws or legislations are needed in order to protect the environment on earth?
- Does the economic gain from such activities have to be distributed amongst nations?
- How can we promote a diplomatic approach by nations and avoid conflict to obtain or explore certain celestial bodies or resources first?
- Are space's resources the "common heritage of mankind" or should ownership rights be attainable?

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