United Nations Office for Outer Space Affairs

Chairs:
Masha Geogdhayeva
Maddy Li

Letter From The Chairs

Dear Delegates,

We would like to welcome you to the MIT Model UN Office for Outer Space Affairs (UNOOSA) committee. We will be discussing two important topics in the realm of outer space policy: Lunar Mining and the Commercialization of Space, and the Militarization of Space.

A little bit about us: Masha Geogdzhayeva is a current freshman studying physics and computer science. Despite never having done Model UN before, she is very interested in international relations and policy, which is why she joined MITMUNC. She has also long been interested in space, so UNOOSA was a natural choice of committee. Maddy Li is a current junior studying mathematics and urban studies and planning with computer science. Last year, she chaired the IAEA committee at MITMUNC. She has a strong interest in technology policy and hopes to go to law school someday.

We have prepared this guide to give you an overview of the topics and provide some suggested reading; however, you can and should do further research while preparing your positions. Please submit your Position Papers here - https://forms.gle/kQBz1woqmTP7jTif7 . We look forward to reading your papers and to hearing your discussion at the conference. Hopefully, together we will be able to investigate new perspectives and opportunities for cooperation.

Looking forward to working with you,

Masha Geogdhayeva and Maddy Li

mitmunc-unoosa@mit.edu

Topic #1: Lunar Mining and the Commercialization of Space

Introduction

For over a century now, science fiction writers have theorized about how humans might come to have a long-term presence on the Moon. However, the only time humans walked on the Moon was during the Space Race, in a Cold War-fueled contest to demonstrate technological superiority. The United States' Apollo program was performative. Since the 1960's, space agencies around the world have found that it is much cheaper to study the Moon using automated rovers and satellites. The Moon, however, is not just an interesting scientific destination. It also contains an abundance of natural resources that could be gathered and exploited, either for export back to Earth or for usage directly in space, on the Moon and beyond. These resources include water, rare-earth metals, and other elements. Additionally, the Moon contains elevated levels of Helium-3, an isotope that could be useful in nuclear fusion energy generation technologies.

In recent years, there has been a renewed interest in the Moon. Notably, the United States' National Aeronautics and Space Administration (NASA) is now operating the ambitious Artemis lunar exploration program, aiming to return humans to the Moon by 2024. China, too, has been sending mission after mission to the Moon, with seven landers and rovers currently active. India also recently sent probes to the Moon, and Russia has plans for an extended lunar exploration sequence in the 2030's. Recent advancements in spacecraft technologies have significantly driven down the cost of access to outer space, initiating what some call a "second space age." A long-term, significant presence on the Moon no longer seems entirely out of reach. With the growing commercialization of space, a commercial or private presence on the Moon is not implausible either. The international

laws that govern outer space were created in a different time period, and no longer reflect the realities of what is possible or the motivations of the significant players.

Key Terms

Lunar Mining

Refers to the extraction of useful resources from the Earth's Moon, either for commercial use (on Earth or in outer space) or for ISRU (below). Lunar resources of particular interest include water, rare metals and other elements, and Helium-3.

Water (H2O)

The Moon's south pole contains harvestable ice. The water therefrom could serve either as a resource to sustain astronauts on the Moon, or as fuel for machinery, spacecraft, etc. Jim Bridestine, the administrator of NASA, has called ice the "most important resource."

Rare-Earth Metals (REMs) and other elements

The Moon also contains a host of other useful industrial elements. Among these are silicon, titanium, and rare-earth metals. Silicon could be used to construct solar panels directly on the lunar surface. Rare-earth metals (REMs) are used in computer manufacturing. 95% of the Earth-bound reserves of REMs are mined in China, which could be a source of geopolitical tension.

Helium 3

An isotope of Helium, which might be useful in nuclear fusion energy generation technologies thanks to its unique nuclear configuration (source: NASA JPL). However, no viable fusion reactors have been achieved so far. Although it is not currently economically advantageous/viable to exploit the Moon for its resources, rapid advances in technology might soon make that possible.

In-Situ Resource Utilization (ISRU)

Refers to the utilization of resources extracted from the Moon directly on lunar soil (or further in outer space), without their return to Earth. ISRU would be crucial to the establishment of permanent infrastructure on the Moon and beyond.

Artemis Program

The current American lunar exploration program led by NASA. Artemis' main goals are to reestablish a human presence on the Moon and begin the development of a more permanent lunar infrastructure. In contrast to the twentieth-century Apollo Program, as well as to other national lunar programs, Artemis relies heavily on the contributions of private space companies.

Key Issues

Currently, the basis of all international space law lies with the Outer Space Treaty of 1967. This treaty was adopted by the UN at the height of the Space Race to govern nations' activities in outer space. The Treaty was mostly focused on disarmament and the peaceful use of outer space. It does not contain any explicit mentions of resource extraction, or of private (commercial) activity in outer space. The Moon Agreement of 1979 was created in an effort to prevent the exploitation of outer space resources, but none of the major players in space exploration (USA, Russia, China) have ratified it. The main issue, then, is the question of the legality of lunar resource extraction and of its commercialization.

Questions to Consider

1. Under the Outer Space Treaty, is it legal to extract resources from the Moon? If yes, under what conditions/limitations? If not, how can such activity be policed?
2. Should there be a difference between legislation governing in-situ resource utilization (ISRU), such as for the construction of a Moon base, and the export of resources back to Earth?
3. Do the rights of private companies in space differ from those of states? How can international space law address the growing commercialization of space?

Bloc Positions

Artemis Accords

In May 2020, NASA unveiled a new international treaty called the Artemis Accords. The Accords are a set of guiding principles for lunar exploration, featuring principles such as the sharing of data and astronaut assistance, thus inheriting the spirit of the Outer Space Treaty. Notably, the Accords explicitly allow for resource extraction and negotiate non-interference between signatories' extraction projects. In October 2020, seven new countries signed the Accords: the United Kingdom, Australia, Canada, Japan, Luxembourg, the United Arab Emirates, Italy, and Ukraine.

United States

A 2015 US law, the Commercial Space Launch Competitiveness Act, allows US companies to "engage in the commercial exploration and exploitation of space resources." The legality of this law under the Outer Space Treaty has been questioned. Furthermore, NASA has opened a bidding process for commercial companies to extract resources on the Moon and deliver them to NASA.

Russia and China

Russia announced that it will not be joining the Artemis Accords because it views the treaty as being "too US-centric." They point out that the Accords were created and signed outside of the framework of the UN, the traditional pathway for such international cooperation agreements. While Russia has ambitions for a Moon program in the 2030's, Russia's space program has been in marked decline recently and its successful outcomes are hard to predict.

China

China has also announced that it will not be signing the Artemis Accords. Unlike Russia, however, it is a major player in lunar exploration, and likely has plans to extract water ice from the lunar South Pole as part of its ongoing lunar program.

Europe

While some European countries such as Italy and Luxembourg signed the Accords, others such as France are hesitant due to the treaty's perceived US-centrism. Luxembourg in particular made headlines several years ago for enacting a law that would allow companies based in the country to keep and extraterrestrial resources they extract.

Suggested Reading

- https://www.jpl.nasa.gov/infographics/infographic.view.php?id=11272
- https://www.unoosa.org/oosa/en/aboutus/history/treaties.html
- https://www.nasa.gov/specials/artemis-accords/index.html
- https://theconversation.com/artemis-accords-why-many-countries-are-refusing-to-sign-moon-exploration-agreement-148134
- https://www.congress.gov/bill/114th-congress/house-bill/2262

- https://www.wired.com/story/luxembourgs-new-law-lets-space-miners-keep-their-plunder/
- https://arstechnica.com/science/2020/09/nasa-says-it-will-pay-private-companies-to-gather-moon-rocks/

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Sarah Scoles, "Luxembourg's New Law Lets Space Miners Keep Their Plunder," Wired (WIRED, July 26, 2017), https://www.wired.com/story/luxembourgs-new-law-lets-space-miners-keep-their-plunder/ .

"Trump EO: The Moon and Other Celestial Bodies Should Be Open to Private Resource Development," Cato Institute, April 28, 2020, https://www.cato.org/publications/commentary/trump-eo-moon-other-celestial-bodies-should-be-open-private-resource.

Topic #2: Space Militarization and the United States Space Force

Introduction

Since the early stages of the Cold War, the exploration of space has been used by countries as both a political indication of technological might as well as a strategic investment in its military. In other words, on top of mankind's fascination with the "final frontier," countries have chosen to invest in the exploration of space in order to a) show both their own citizens and other countries that they should be considered among the technologically-advanced countries in the world and b) explore the potential of placing military satellites with reconnaissance or weapon deployment capabilities.

In 1957, in the early stages of the Cold War, the USSR deployed the first ever man-made satellite, *Sputnik 1*. In the next decade, both the USSR and the US deployed satellites, progressing from basic reconnaissance satellites to intercontinental ballistic missiles (ICBMs). As offensive military-use satellites became common, the US and USSR both explored ways of countering these technologies, including creating kamikaze-style satellites and anti-ICBM missiles. This culminated in proposals such as the Strategic Defense Initiative (SDI), proposed by President Ronald Reagan in 1983, which would place high-energy lasers in space to shoot down USSR ICBMs while they flew through outer space.

Since the end of the Cold War, many other countries have continued to explore space and place strategic satellites into orbit. These countries include the United Kingdom, France, Germany, Italy, Japan, China, India, Israel, and Spain. While the militarization of space has always been a politically contentious but ultimately secretive topic, technological advancements have been made due to military investment in space. For example, Global Position System (GPS) was initially

developed by the US Department of Defense to local the precise time location of military deployments throughout the world, and evolved to now be used by civilians to navigate routes as simple as a drive through the neighborhood.

Key Terms

Outer Space

There is no official boundary as to where the upper atmosphere of the Earth ends and where outer space starts. However, for the purposes of this conference, we will use the Outer Space Treaty definition of 100 km, or approximately 62 miles, above sea level.

Reconnaissance Satellite (aka Spy Satellite)

Reconnaissance satellites, more commonly known as spy satellites, are observation satellites that are capable of taking photos or film of spaces on the surface of the Earth, detecting missiles and nuclear explosions, or taking electronic or radar measurements.

Intercontinental Ballistic Missiles (ICBMS)

Intercontinental ballistic missiles are missiles that generally enter outer space (as we define above, at least 100 km above sea level), and are capable of hitting any target on earth on the order of magnitude of minutes (rather than hours or days).

Key Issues

So far, there is no hard definition of what militarization of space means. In this committee, delegates will come up with a formal definition of what militarization of space means. Furthermore, we will discuss current events, particularly with regards to the recent creation of the Space Force on

the part of the United States. Along these lines, delegates will be expected to establish a method for determining if equipment sent into orbit is a weapon or otherwise could be used for the militarization of space.

Questions to Consider

1. While the Outer Space Treaty was significant in ensuring that outer space is a place for peaceful exploration, it does not have a formal definition of "space militarization." What does space militarization mean?
2. No weapons have ever been deployed directly into space, but does a reconnaissance satellite constitute "militarization?" Where is the line drawn between defensive and offensive equipment in space? What about defensive and offensive equipment on the ground that is for the purpose of defending a country from space?

Bloc Positions

United States

The United States, having exited the Cold War as the technological superpower of the world, has the world's most advanced space program. In 2020, NASA's budget for space exploration was $21.09 billion, and has 1,425 satellites in operation. Of those, 173 are for government purposes and 208 are for military purposes.

As of December 2019, the United States established a US Space Force, the eighth branch of the US uniformed services. The US Space Force operates 77 spacecraft, but as the newest branch of the US uniformed services it currently has only minimal guidelines for its operations. It would be advisable for the US delegate to get the most recent information on the responsibilities and capabilities of the US Space Force at the time of the conference.

Russia

Russia, having inherited the USSR space arsenal, currently has approximately 160 satellites, 100 of which are military spacecraft. It currently has the third-largest military satellite constellation in orbit, and has an estimated annual spending of $1 billion on that constellation. There is little innovation on the Russian fleet of weapons.

China

China is aiming to replace the US as the dominant power in space. Current Chinese leadership aims to secure space for China as both an economic and military domain, and has recently tested a number of new rockets proving its space capabilities. Currently, China has 363 satellites in orbit.

European Space Agency: France, Germany, Italy, Spain (and Remaining European Union)

The member states of the European Union are aiming to place themselves among the top three powers in space. The named EU member states above have their own military capabilities in space, but the establishment of the European Space Agency transferred responsibility for intergovernmental organization in the space capabilities of the European Union as a whole.

United Kingdom

The United Kingdom established the United Kingdom Space Agency in 2010, inheriting several different organizations in the UK involved in matters of outer space. The UK was initially a part of the European Space Agency, but as of 2020 it is no longer a part of the EU. The United Kingdom currently has 34 satellites.

Japan

The Japan Aerospace Exploration Agency currently has 100 satellites, of which approximately 53 are considered for earth observation or communications.

Suggested Reading/Watching

"UCS Satellite Database." Union of Concerned Scientists. https://www.ucsusa.org/resources/satellite-database#:~:text=Total%20number%20of%20US%20satellites%3A%201%2C425&text=How%20many%20satellites%20does%20a,countries%20have%20earth%2Dobserving%20satellites%3F <notes: excellent overview of state space capabilities.>

"Proposed Prevention of an Arms Race in Space." United Nations, https://www.nti.org/learn/treaties-and-regimes/proposed-prevention-arms-race-space-paros-treaty/ <notes: source for potential policies in space militarization.>

US Space Force. https://www.spaceforce.mil/About-Us/About-Space-Force/Space-Capabilities/ <notes: most up-to-date information on the US Space Force.>

"Space Force," Netflix. https://123movies.com/tv/85922/space-force <notes: an excuse to procrastinate. somewhat accurate depiction of absurdities of space battle.>

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