The United Nations Office for Outer Space Affairs (UNOOSA)

Background Guide Topic:

Developing Space Exploration Laws

Senzoku Gakuen Model United Nations March 26-27, 2022
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Director's Note

Dear Delegates,

Welcome to the United Nations Office of the Outer Space Affairs of the Japan Metropolitan Model United Nations conference 2022! My name is Yuumi Inai, and I am the director of the Intermediate 1 Committee. I am currently a second-year student attending Senzoku Gakuen Senior High School. I am excited to be a part of this conference with all of you.

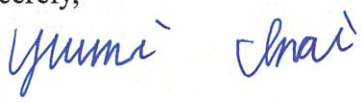
I have been participating in Model United Nations since junior high school, and this is my fourth year being part of JMMUN. I am also the president of the Senzoku Gakuen MUN club for this year. Four years ago, I never expected that I would be playing such an important role in the MUN club since I had never found MUN so interesting as I do at the moment. In my experience, I never found MUN exciting due to the fact that I felt a sense of obligation to take part in club activities. Now that I have altered my position from being a member of the club into managing the club, I never forget to value the enjoyment of the club members. Therefore, my advice for delegates is to always have fun! You can never fully learn something if you do not enjoy it.

The topic of this committee may not be something that we usually think of in our daily lives since it takes place in a world that most of us have never seen: space. Although it may be difficult to come up with ideas for a topic you are unfamiliar with, it is always exciting to expand your imagination with researched proof and knowledge.

Your job is to come up with creative solutions to develop space exploration laws. Although no one can predict the future, I hope that long-term solutions can be brought up through this two-day conference.

I hope you have a stimulating experience through this conference, and we wish you all the best, and most importantly, have fun!

Sincerely,



Yuumi Inai, Director
United Nations Office of the Outer Space Affairs
Senzoku Gakuen Model United Nations Club
Japan Metropolitan Model United Nations 2022

Introduction of the Committee

The United Nations Office for Outer Space Affairs was established by the General Assembly in 1958 to promote peaceful and secure exploration of space.[1] UNOOSA also seeks to assist development in space science and technology for sustainable development by encouraging space research programs and aiding international cooperation.[2]

The Office, headed by the director, consists of five sections: Committee, Policy and Legal Affairs Section, Space Applications Section, Executive Secretariat of the International Committee on GNSS, United Nations Platform for Space-Based Information for Disaster Management and Emergency Response, and Office Director. Committee, Policy and Legal Affairs Section services the sessions of UN-space, assisting UN Member States in legal affairs relating to the exploration and peaceful uses of outer space. The Space Applications Section implements the United Nations Programme on Space Applications in an attempt to achieve the SDGs. United Nations Platform for Space-Based information for Disaster Management and Emergency Response allow all countries access to space-based information for disaster risk reduction. Furthermore, the Executive Secretariat of the International Committee on Global Navigation Satellite System supervises global navigation satellite systems for further development.

One of the current efforts made by UNOOSA is the seven thematic priorities that were endorsed to prepare for the 50th anniversary of the United Nations Conference on the Exploration and Use of Outer Space in 2016.[3]

UNOOSA stresses the importance of not only promoting sustainable development through space exploration but also preserving space for future generations, thus sustainability for outer space activities.[4]

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[1] Robert.wickramatunga. (n.d.). *United NationsOffice for outer space affairs*. About us. https://www.unoosa.org/oosa/en/aboutus/index.html.

[2] Robert.wickramatunga. (n.d.). *United NationsOffice for outer space affairs*. COPUOS. https://www.unoosa.org/oosa/en/ourwork/copuos/index.html.

[3] Tanya.keusen. (n.d.). *United NationsOffice for outer space affairs*. Space Exploration and Innovation. https://www.unoosa.org/oosa/en/ourwork/topics/space-exploration-and-innovation.html.

[4] Martin.stasko. (n.d.). *United NationsOffice for outer space affairs*. Roles responsibilities. https://www.unoosa.org/oosa/en/aboutus/roles-responsibilities.html.

Key Terms

UNOOSA recognizes "the long-term sustainability of outer space activities" as the ability to continue space activities indefinitely into the future. The benefits of the exploration must be achieved equally by all people and intend to meet the needs of the present generations while preserving the outer space environment for future generation.[5]

rationae loci: the place where transport is provided (airspace or outer space)

rationae materiae: the means of transport

Current Situation

This committee has concluded five international treaties and five sets of principles on space-related activities.

These five treaties deal with issues such as the non-appropriation of outer space by any one country, arms control, the freedom of exploration, liability for damage caused by space objects, the safety, and rescue of spacecraft and astronauts, the prevention of harmful interference with space activities and the environment, the notification and registration of space activities, scientific investigation and the exploitation of natural resources in outer space and the settlement of disputes.

Each of the treaties stresses the notion that outer space, the activities carried out in outer space and whatever benefits might be accrued from outer space should be devoted to enhancing the well-being of all countries and humankind, with an emphasis on promoting international cooperation.

The treaties commonly referred to as the "five United Nations treaties on outer space" are: "Outer Space Treaty," "Rescue Agreement," "Liability Convention", "Registration Convention," and "Moon Agreement." [6]

The Outer Space Treaty provides the basic framework on international space law, including the following principles:

- the exploration and use of outer space shall be carried out for the benefit and in the interests of all

[5] *Guidelines for the Long-term Sustainability of Outer Space Activities* https://www.unoosa.org/res/oosadoc/data/documents/2018/aac_1052018crp/aac_1052018crp_20_0_html/AC105_2018_CRP20E.pdf

[6] *Space Law Treaties and Principles*. United Nations Office for Outer Space Affairs. (n.d.). https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html.

countries and shall be the province of all mankind;

- outer space shall be free for exploration and use by all States;
- outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means;
- Countries shall not place nuclear weapons or other weapons of mass destruction in orbit or on celestial bodies or station them in outer space in any other manner;
- the Moon and other celestial bodies shall be used exclusively for peaceful purposes;
- astronauts shall be regarded as the envoys of mankind;
- Countries shall be responsible for national space activities whether carried out by governmental or non-governmental entities;
- Countries shall be liable for damage caused by their space objects; and
- Countries shall avoid harmful contamination of space and celestial bodies.[7]

The Rescue Agreement provides that countries shall take all possible steps to rescue and assist astronauts in distress and promptly return them to the launching countries, and that countries shall, upon request, provide assistance to launching countries in recovering space objects that return to Earth outside the territory of the Launching country.[8]

The Liability Convention provides that a launching country shall be absolutely liable to pay compensation for damage caused by its space objects on the surface of the Earth or to aircraft, and liable for damage due to its faults in space. The Convention also provides for procedures for the settlement of claims for damages.[9]

The Registration Convention expanded the scope of the United Nations Register of Objects Launched into Outer Space and addressed issues relating to States Parties

[7] *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.* United Nations Office for Outer Space Affairs. (n.d.). https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html.

[8] *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.* United Nations Office for Outer Space Affairs. (n.d.). https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introrescueagreement.html.

[9] *Convention on International Liability for Damage Caused by Space Objects.* United Nations Office for Outer Space Affairs. (n.d.). https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introliability-convention.html.

responsibilities concerning their space objects.[10]

The Moon Agreement reaffirms and elaborates on many of the provisions of the Outer Space Treaty as applied to the Moon and other celestial bodies, providing that those bodies should be used exclusively for peaceful purposes, that their environments should not be disrupted, that the United Nations should be informed of the location and purpose of any station established on those bodies. In addition, the Agreement provides that the Moon and its natural resources are the common heritage of mankind and that an international regime should be established to govern the exploitation of such resources when such exploitation is about to become feasible.[11]

Subtopic I: Sustainable Development of Space Activities

The effect of global warming on satellites, man-made space flights, space debris, and human activity in space all cast doubt on the further exploration of space in upcoming years. In order to ensure a sustainable development of space activities, the natural space environment must be preserved through addressing risks in space.[12]

Space science is essential to improve the daily lives of people "through their contributions to, among other things, environmental monitoring, management of natural resources, meteorological forecasting, climate modelling, satellite navigation, communications, and early warning systems to help mitigate potential disasters."[13] In order to obtain further benefits from space explorations, the issue of the unsustainability of space exploration must be addressed. UNOOSA stresses the importance of keeping outer space safe and stable for peaceful purposes, and "open for exploration, use and international cooperation by current and future generations, in the interest of all countries, irrespective of their degree of economic or scientific development, without discrimination of any kind and with due

[10] *Convention on Registration of Objects Launched into Outer Space*. United Nations Office for Outer Space Affairs. (n.d.). https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introregistration-convention.html.

[11] *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies* . United Nations Office for Outer Space Affairs. (n.d.). https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html.

[12] https://www.unoosa.org/pdf/limited/l/AC105_L274E.pdf

[13] Tanya.keusen. (n.d.). *United NationsOffice for outer space affairs*. Long-term sustainability of outer space activities. https://www.unoosa.org/oosa/en/ourwork/topics/long-term-sustainability-of-outer-space-activities.html.

regard for the principle of equity."[14] However, as people seek profits from new resources, "some worry that existing structures of class and racial inequality will be repeated or even intensified with space colonization."[15] In the committee's annual debate, many delegates, including representatives from Pakistan, Nigeria, and El Salvador emphasized the need for greater international cooperation. The representative of Pakistan further expressed appreciation for space development, stating that it has become a crucial-driver of the country's socio-economic growth, especially in the fields of agriculture, communication, health, disaster-preparedness and conservation. [16] The international community must therefore recognize that space is not a means of obtaining social power over marginalized groups, and indeed an instrument to improve the lives of all people, regardless of the country's economic, technological, and scientific development.

The Proposal of "Long-Term Sustainability of Space Activities"

In 2009, the Permanent Representative of France proposed a new document, entitled "Long-term sustainability of space activities," on the agenda in the general debate at the forty-sixth session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space. This treaty[17] ensures a precise, complete, and quick access to information about the space environment, objects, and risks through international efforts. This suggests countries to act for the interest of all nations, and strongly stresses the importance of international cooperation. However, the guidelines are not legally binding under the international court, and are voluntary. [18]Although the guideline, established by professionals, is effective in

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[14] *Guidelines for the Long-term Sustainability of Outer Space Activities*
Committee on the Peaceful Uses of Outer Space
https://www.unoosa.org/res/oosadoc/data/documents/2018/aac_1052018crp/aac_1052018crp_20_0_html/AC105_2018_CRP20E.pdf

[15] Pages, T. S. (n.d.). *Outer space and earthly inequalities - there's research on that*. Theres Research on That Outer Space and Earthly Inequalities Comments.
https://thesocietypages.org/trot/2017/03/24/outer-space-and-earthly-inequalities/.

[16] United Nations. (n.d.). *Outer space benefits must not be allowed to widen Global gap Between economic, social Inequality, Fourth Committee Told, CONCLUDING debate on ITEM | Meetings coverage and press releases*. United Nations.
https://www.un.org/press/en/2014/gaspd.doc.htm-0.

[17] Proposal for the inclusion of a new item on the agenda of the Scientific and Technical Subcommittee, beginning at its forty-seventh session, in 2010
https://www.unoosa.org/pdf/limited/l/AC105_L274E.pdf

[18] THE UN COPUOS GUIDELINES ON THE LONG-TERM SUSTAINABILITY OF OUTER SPACE ACTIVITIES
https://swfound.org/media/206227/swf_un_copuos_lts_guidelines_fact_sheet_august_2018.pdf

combating space-related issues, more needs to be done to fully utilize its role and utilize it for the benefits of the international community.

Environmental Threats

The increasing amount of space debris, complexity of space operations, emergence of large constellations and risks of collision with space objects raise concerns about the long-term sustainability of space activities. [19]

Currently, there are "34,000 pieces of space junk bigger than 10 centimetres in size and millions of smaller pieces" that pose considerable risks to satellites.[20] Space debris, which is often emitted from manmade space aircrafts, could be disastrous when they collide with satellites orbiting earth. Since objects orbit Earth at a very high speed, a small collision can damage a space aircraft. The first collision happened on July 24, 1996, between a satellite and a piece of space junk, although it fortunately ended with a slight damage on the satellite. [21] Researchers are deeply concerned that space debris would destroy other satellites and aircrafts, resulting in the Earth's orbit becoming unusable. In order to forestall this case, space agencies started tackling the problem by burning up all the fuel in a rocket stage to prevent it from exploding later.[22]

In order to mitigate the impacts of both natural and man-made hazards, UNOOSA proposes four main solutions: implementation of national laws that limit space-related actions, sharing of information, international cooperation, and promotion of space-related research.[23]

Subtopic II: Space Tourism

Space tourism is human space travel for recreational purposes. There are different types of space tourism, including orbital, suborbital, and lunar space tourism.[24]

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[19] *Guidelines for the long-term Sustainability of Outer Space*
Committee on the Peaceful Uses of Outer Space
https://www.unoosa.org/res/oosadoc/data/documents/2018/aac_1052018crp/aac_1052018crp_20_0_html/AC105_2018_CRP20E.pdf

[20] Validation request. (n.d.).
https://www.nhm.ac.uk/discover/what-is-space-junk-and-why-is-it-a-problem.html.

[21]

[22] Encyclopædia Britannica, inc. (n.d.). *Space debris*. Encyclopædia Britannica.
https://www.britannica.com/technology/space-debris.

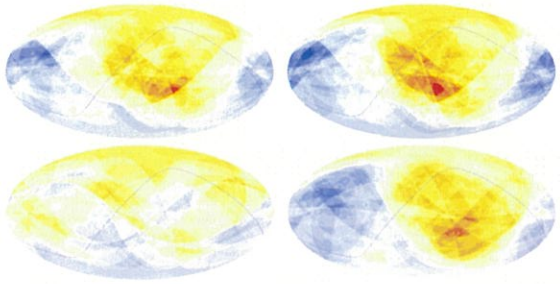
[23] *Guidelines for the long-term Sustainability of Outer Space*
Committee on the Peaceful Uses of Outer Space
https://www.unoosa.org/res/oosadoc/data/documents/2018/aac_1052018crp/aac_1052018crp_20_0_html/AC105_2018_CRP20E.pdf

[24] G. von der Dunk, F. (2011). *Space Tourism, Private Spaceflight and the Law: Key Aspects* . University of Nebraska Lincoln.

Although space tourism causes many problematic issues, André Farand, Head Programme Legal Services division at European Space Agency, the United States of America has "made the choice to support the development of space transport vehicles in order to reap the full benefits of the significant investments made by the private sector in space tourism activity."[25] There will be an increased need to maintain the area of outer space directly above the planet to ensure the safe travel of space tourists, but the new industry has yet to show a full awareness of this problem. There is a need to come up with specific space exploration laws in order to protect space from humanitarian purposes.

Environmental Issues

A 2010 study published in *Geophysical Research Letters* raised concerns that the growing commercial spaceflight industry could accelerate global warming. The study, funded by NASA and The Aerospace Corporation, simulated the impact of 1,000 suborbital launches of hybrid rockets from a single location, calculating that this would release a total of 600 tonnes of black carbon into the stratosphere. They found that the resultant layer of soot particles remained relatively localized, with only 20% of the carbon straying into the southern hemisphere, thus creating a strong hemispherical asymmetry.[26]



[27]

This unbalance would cause the temperature to decrease by about 0.4 °C (0.72 °F) in the tropics and subtropics, whereas the temperature at the poles would increase by between 0.2 and 1 °C (0.36 and 1.80 °F).

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https://digitalcommons.unl.edu/spacelaw/?utm_source=digitalcommons.unl.edu%2Fspacelaw%2F60&utm_medium=PDF&utm_campaign=PDFCoverPages.

[25] Ross, M., Mills, M., & Toohey, D. (2010, December 28). *Potential climate impact of black carbon emitted by rockets*. Advancing Earth and Space Science. https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2010GL044548#:~:text=A%20global%20climate%20model%20predicts,and%20distributions%20of%20ozone%20and.

[26] Ross, M., Mills, M., & Toohey, D. (2010, December 28). *Potential climate impact of black carbon emitted by rockets*. Advancing Earth and Space Science. https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2010GL044548#:~:text=A%20global%20climate%20model%20predicts,and%20distributions%20of%20ozone%20and.

[27] Wiegand, A. (n.d.). photograph.

The ozone layer would also be affected, with the tropics losing up to 1.7% of ozone cover, and the polar regions gaining 5–6%.[28]

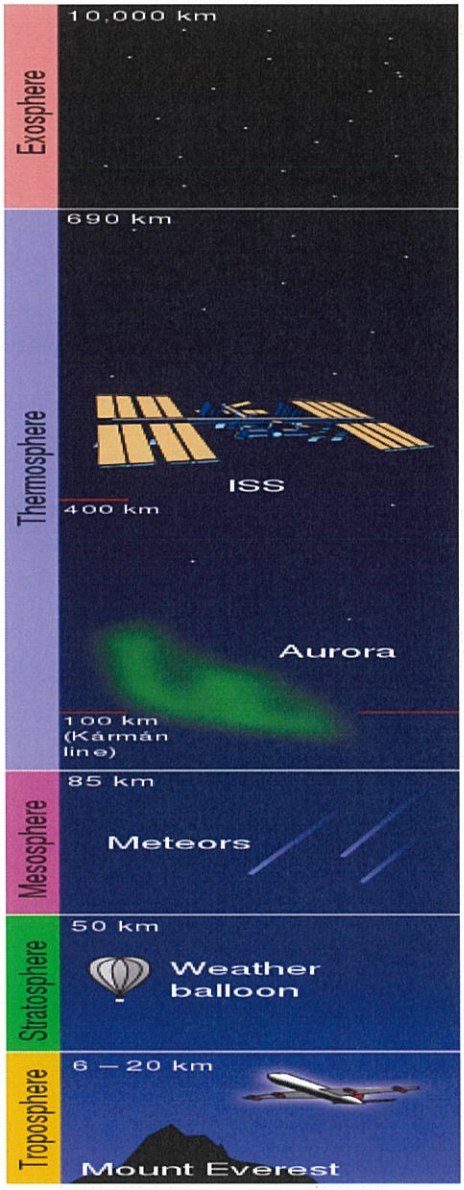
The Law Applicable to Space Tourism

Space tourism laws are very diverse and subject to two main criteria: the first, *rationae loci*, is about the place where transport is provided (airspace or outer space); the second, *rationae materiae*, is about the means of transport. No agreement has conclusively identified a demarcation line between airspace and outer space. [29] Since the beginnings of outer space exploration, countries and the United Nations have never been able to agree on a boundary between airspace and outer space. For several decades, the United Nations Committee for the Peaceful Use of Outer Space (COPUOS) has been trying to negotiate to delimit airspace and outer space. The reasons for the disagreement between countries are related to their sovereignty over their territories. Civil aviation law is very favorable to the sovereignty of countries. Thus, *Article 1* of the 1944 Chicago Convention states that "the contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory."[30] Space law has an opposite logic from countries' opinions and provides for total freedom of movement of countries and proscribes any sovereignty over the celestial bodies. Specialists have considered that the limit should be between one hundred to one hundred and thirty kilometers.

[28] Mann, A. (2010, October 22). *Space tourism to accelerate climate change*. nature. https://www.nature.com/articles/news.2010.558.

[29] Gouyon Matignon, L. de. (2019, March 5). *SPACE TOURISM LEGAL ASPECTS*. SPACE LEGAL ISSUES. SPACE TOURISM LEGAL ASPECTS.

[30] International Civil Aviation Organization. (1944). *Convention on International Civil Aviation at Chicago* [White Paper]. https://www.icao.int/publications/documents/7300_orig.pdf



[31]

Moreover, researchers at the University of Calgary evaluated this celestial boundary at one hundred and eighteen kilometers. However, at a diplomatic level, there is no distinguished criterion among countries that specifies the upper limit to airspace. Therefore, COPUOS can only continue to consult with its members and allow countries to regulate national space activities from their respective territories.

Effects on Third Parties

Contracts and space activities organized by private organizations have an immediate effect on third parties as a result of international treaties and agreements governing outer space activities. When private entities cause damage through space activities, governing bodies are responsible for finding out the nationality of the said private entities in order to question the responsibility of the nation.

In the event of damage caused by the fall of a capsule or an aircraft transiting through outer space, a prejudiced country may claim compensation from the country of origin for the activities of its citizens. In the case of suborbital space tourism in the United States of America, the Federal Aviation Administration considered that companies must ensure for themselves and the country up to five hundred million dollars.[32]

[31] *The five basic layers of the atmosphere*. (n.d.). NATIONAL WEATHER SERVICE. https://www.weather.gov/jetstream/layers.

[32] Gouyon Matignon, L. de. (2019, March 5). *SPACE TOURISM LEGAL ASPECTS*. SPACE LEGAL ISSUES. SPACE TOURISM LEGAL ASPECTS.

Subtopic III: Health Risks

Going into space has a range of health risks from radiation to the decrease in bone density due to the very different environment humans will be subjected to.[33] The Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space was signed on April 22, 1968. [35] The Agreement sets forth the responsibility of states for the health and wellbeing of their astronauts. However, there are currently no unanimous criteria for prevention of the increased health risks and potential death astronauts face.

Radiation in Space

Three major sources contribute to the space radiation environment: particles trapped in Earth's magnetic field, solar energetic particles from the sun, and galactic cosmic rays. Exposure to increased radiation can be associated with both short and long-term health consequences, depending on how much total radiation astronauts experience and the time frame in which they experience that exposure. Not only will they be exposed to more radiation in space than on Earth, but also the radiation they are exposed to could pose increased risks. These increased risks range from cancer to degenerative diseases, such as heart disease and cataracts.

Currently, no criterion are unanimous among states, leaving it up to states to regulate the health precautions for their astronauts. On top of standardized procedures, there is ongoing research into possible solutions to increase protection against radiation; the scientists on the Space Radiation Superconducting Shield project are working on a magnesium diboride superconductor that would deflect charged particles away from a ship.

Zero-Gravity in Space

Without Earth's gravity affecting the human body, weight-bearing bones lose on average 1% to 1.5% of mineral density per month during spaceflight. Astronauts also face an increased risk of losing muscle mass and vision problems. If preventive or countermeasures are not implemented, they may experience an increased risk of developing kidney stones due to dehydration and increased excretion of calcium from their bones.

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https://www.spacelegalissues.com/space-law-space-tourism-legal-aspects/.

[33] Mars, K. (2021, June 9). *What Happens to the Human Body in Space?* NASA. https://www.nasa.gov/hrp/bodyinspace/

[35] R. (1968, April 22). Rescue Agreement. United Nations Office for Outer Space Affairs. https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introrescueagreement.html

There is a lot of research being done and devices to counter the effects of being in a zero gravity environment. For example, medicines that NASA is studying, such as potassium citrate, may help combat the physiological change that could increase the risk of developing kidney stones. Bisphosphonate medications have also been shown in NASA studies to be effective in preventing bone loss.

Past Actions

1967: UNOOSA passed a resolution for agreement on the rescue of astronauts, the return of astronauts and the return of objects launched into outer space.
1971: UNOOSA passed a resolution for preparation of an international treaty concerning the moon.
1979: UNOOSA passed a resolution for agreement governing the activities of countries on the moon and other celestial bodies.
1982: UNOOSA passed a resolution to improve principles governing the use by countries of artificial earth satellites for international direct television broadcasting.
1982: UNOOSA passed a resolution to improve principles governing the use by states of artificial earth satellites for international direct television broadcasting.
1982: UNOOSA passed a resolution to question the review of the convention on international liability for damage caused by space objects.
1986: UNOOSA passed a resolution to question the review of the convention on registration of objects launched into outer space.
1992: UNOOSA passed a resolution about principles relevant to the use of nuclear power sources in outer space.
2004: UNOOSA passed a resolution for application of the concept of the launching country.
2015: UNOOSA passed a resolution in order to improve the transparency and conference-building measures in outer space activities.
2006: UNOOSA passed a resolution for disaster management and emergency response.
2007: UNOOSA passed a resolution to recommend countries on enhancing the practice of countries and intergovernmental organizations in registering space objects.
2007: UNOOSA passed a resolution to prevent an arms race in outer space.
2019: UNOOSA passed a resolution to improve international cooperation in the peaceful uses of outer space.[34]

[34] *Documents and resolutions database.* United Nations Office for Outer Space Affairs. (n.d.). https://www.unoosa.org/oosa/documents-and-resolutions/search.jspx?&view=resolutions.

Questions to Consider

- How does your country handle space exploration laws? Has it carried out actions to develop space exploration laws with/without the UN?
- Does your country take part in space exploration? If so, how does your country affect the environment in space by taking part in space exploration?
- Keeping in mind that the United States of America has "made the choice to support the development of space transport vehicles in order to reap the full benefits of the significant investments made by the private sector in space tourism activity, what laws can your country implement to protect the environment damaged by space tourism?
- Keeping in mind that space science is essential to improve the daily lives of human beings, what is your country's stance on space exploration?

Guidelines for Position Papers

Position papers must clearly articulate the current situation of your country and briefly explain the past actions it has taken, further denoting possible solutions. Papers may also include international resolutions and strategies to develop space exploration laws; however, the main focus **must** be on your country. Every year, a handful of delegates submit position papers with very basic information about their countries, such as geographical location and major trade exports. Unless such information directly relates to the topic, it should not be addressed in position papers at all.

Closing Remarks

I would like to thank you all for taking an interest in and participating in JMMUN. I hope that this experience will benefit you.

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