



# UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS

*Background Guide*

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# Director's Letter

Dear UNOOSA Delegates,

My name is Angelus McNally, and I'm honored to serve as your Director for KINGMUN 2018's UNOOSA. Joining me are two incredibly talented staff members: Audri Saulters as Chair and Ciara Gormley as Assistant Director. I'm very excited to help make this conference, whether it is your first or 13th (as it is mine), the best experience possible.

From space, our borders are invisible. Wars and feuds lasting decades or centuries pale in comparison to the grand scale of the universe's 13.7 billion years. Is outer space, then, a place to escape from conflict and finally achieve international peace and cooperation? Or should space be free to be taken advantage of by any means necessary? In searching for answers, we have selected two topics that both push the horizons of human exploration and call into question the jurisdiction and role of governing bodies in an unfamiliar frontier.

As threats of nuclear war, climate change, and general human-caused disaster loom, the idea of escaping our planet becomes more and more appealing. To travel, however, is to appreciate one's own home more. It is with the hope that delegates begin to understand the power of both outer space and their Earth that we set forth in UNOOSA, and the weekend of enthralling debate its delegates will bring.

Thank you for choosing to come to KINGMUN! We look forward to meeting you.

Warmly,  
Angelus (Angie) McNally  
Director of UNOOSA

# ~ TOPIC 1 ~

## History

The spread of human populations across the planet arose from an innate desire to explore the unknown, build new societies from the ground up, and seek riches or material gain. Historically, however, new settlements are governed only by those colonizing, which can result in disputes with other groups, moral corruption and can have disastrous consequences. The European colonization of the Americas perhaps best exemplifies the complications and repercussions of self-governed exploration, as countless wars, political arguments, and mass genocides resulted. Thus, as humanity looks towards the final frontier, it is imperative that the entire global community understands and agrees to the conditions of colonization of other planets, and views extraterrestrial human life as a joint effort of all mankind, not just of a few nations seeking to solely benefit themselves. In addition to international regulation, another primary challenge when it comes to settling on nearby planets concerns the environment -- both of the bodies being colonized, and Earth's itself. It's practically indisputable that humans have had an outsized impact on the Earth's environment, which could eventually result in the necessity of seeking a new planet to call home, should current trends continue. However, many environmental activists argue that spreading human colonization should be a last resort, an idea only to be entertained if there is absolutely no other option for sustainable human life, and not as a primary option. This begs the question: should humans be looking to colonize other planets at all? If they do, is it okay to continue to wreak havoc on the Earth's environment knowing there's a "backup planet"? And what environmental regulations, if any, should be placed on extraterrestrial colonies to ensure other planets are kept as pristine as possible? Is "terraforming" a planet (changing the composition of a planet's environment and atmosphere to make it more suitable to human preferences) a viable option? All these questions, and more must be unanimously discussed and agreed upon before the door to colonization is opened, lest disaster and potential global wars ensue.

## Past UN Action

Outer space, as one of few areas first accessed after the foundation of the United Nations, has been regulated by multinational organizations since humans first developed the tools to explore it. Each year, the General Assembly of the United Nations passes a resolution entitled "International cooperation in the peaceful uses of outer space", which reinforces that space should be used "for the benefit and in the interests of all countries and shall be the province of all mankind". Because of this, there is some ambiguity in how territory should be divided if and when colonization occurs. Article 2 of the Outer Space Treaty clearly states that "Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." However, given plans of governmental and non-governmental bodies alike to establish colonies on Mars (and, one day, other planets), it is critical to consider how territory can be appropriated before conflict arises. In the case of a territory dispute, it should also be considered which court should settle that dispute. If these issues are not resolved prior to their emergence, militarization may occur -- something explicitly banned by the Outer Space Treaty.

With a delay in communications, an entirely new environment, and a much smaller population (much like in colonial America), it would be difficult for an extraterrestrial colony to rely on governance from Earth. United Nations resources on fair governance can be looked to for guidance when establishing a new society. While not all of the Sustainable Development Goals may apply, they can be used to design infrastructure that avoids mistakes made on Earth. A history of human rights violations can be avoided through the study of past United Nations resolutions. In short, as an entirely new world forms on a colony, the work of the United Nations may provide direction. The Mars One project will provide astronauts with information to create their own governance

system; delegates should consider whether all potential colonies should take this route or if more concrete plans on government should be made.

Work done by the United Nations and its bodies may be useful when adapting to the environment of a new planet. Due to desertification in many parts of the world, research has been done on discovering or developing photosynthetic cultures and microorganisms that turn desert sand into soil. Earth-developed solutions like these have been advocated for by the United Nations and may be quite beneficial when repurposed for a new planet. Currently, the United Nations and its committees use data collected from satellites for disaster prevention and relief (UN-SPIDER), global health tracking and epidemiology, and food security and agriculture maintenance. In an extraterrestrial settlement, these space-based data collection technologies can be more thoroughly implemented as society and infrastructure are built from the ground up -- but at the cost of the privacy of the colonists. Other technologies will be in place out of necessity: those monitoring air and water quality and radiation levels. In a society that requires constant surveillance to keep its inhabitants alive, what laws can be set in place to preserve privacy?

## Current Situation

In light of recent natural disasters and political tensions that have led to the displacement of a growing number of people, relocating to other planets is an especially appealing and also still a hypothetical solution. Humans have not yet landed on other planets in our solar system, and when it comes to living in space, most are primarily focused on the status of the International Space Station. However, noting the most recent launch of SpaceX's Falcon Heavy rocket in February, one comparable to Saturn V as the world's most powerful rocket, space technologies are undeniably advancing in the favor of making space colonization more possible. In the private sector, figures such as SpaceX CEO Elon Musk have been vocal about making developments to eventually allow humanity to inhabit Mars.

In 2017, after the discovery of the TRAPPIST-1 exoplanet system, one that may host habitable conditions for humans on its planets, the consideration of space colonization as a possibility has become more prevalent. Following the TRAPPIST-1 discovery, attention has been set on further technological developments, such as NASA's James Webb Space Telescope, that will measure the components such as carbon and water that sustain life on Earth in other spatial objects.

As of 2018, there are no legally binding claims on planets by any governmental organizations or private corporations, nor any legal options that would allow one to do so. Space is ultimately treated as a "province of all mankind" according to Article I and II of the Outer Space Treaty. However, since settlements are allowed to be made on spatial objects as long as they aren't sovereign claims on behalf of a state, it's still possible for humans to reside in space under the jurisdiction and laws of the country of which they were sent from. Articles VI to VIII of the Outer Space Treaty affirms this by stating that settlements in space are under the authority of the country that authorized their missions but must also be openly accessible to those from other nations. With this, the UNOOSA must be conscious about sovereignty claims of any space settlements.

Importantly, in order to successfully colonize space, there must be ways to transport people to the destination and sustain them. While NASA already plans to send humans to Mars as soon as 2030, the expenses of travel to an ordinary citizen would be incredibly expensive and leave only a very small fraction of Earth's population to be able to reside on the planet. To colonize such local planets, the planet itself would have to emulate Earth's conditions in that it would need to be warmed and a carbon-dioxide-type atmosphere would have to be created. Planets that already have these conditions are light-years away, which serves as another obstacle. The issue of basic needs such as food and water would also have to be considered. Technologies in the International Space Station have already proved that it's possible to grow plants in space using controlled environments. However, one of the primary issues is to determine whether or not it is ethical to divert government spending to potentially alter planetary states for the benefit of a few in the first place.

# Bloc Positions

## Major Space Players

While a Space Race is not as competitive today as it was in the Cold War era of the 1960s, global superpowers like the United States or the Russian Federation both have bragging rights and national morale to be gained from pioneering space colonization. This unfriendliness has faded somewhat, yet space still remains a frontier in which any country has much to gain from investment in it. In the meantime, the space agencies such as those of China, India, and the UK have grown rapidly as their economies have grown, making them prominent in the global space community. These nations tend to divert more government funding towards their respective space programs as a result.

## Emerging Space Players

Nations with smaller or historically less stable economies are finding support for going to space through organizations like the European Space Agency or by piggybacking their own satellites and crew members on missions from other space agencies. Yet as economies like Ukraine, Italy, Israel, Germany, the UAE, Canada, Brazil, Australia, South Africa, Iran, France, and South Korea see economic growth, they may look to develop robust space agencies of their own, and possibly get their own feet in the door of space colonization. These nations generally support space programs, but it would be in their best interests to ensure that larger, wealthier nations that colonize first don't develop too much power or completely control the colonization industries and politics before these smaller nations have a chance of their own.

## Private Space Players

While nations are busy dealing with issues within their borders, private companies -- prominently SpaceX -- are looking to the stars. With more specific projects, budgets, and timelines than those of government space organizations, private companies can funnel more manpower and money into developing specific technologies or achieving certain goals with the use of government-provided resources and support. They generally have more aggressive plans and concrete goals. SpaceX, in particular, has developed several rockets that could be pivotal to effective colonization, such as the Falcon Heavy (which could carry large amounts of cargo and passengers), and reusable launch rockets that significantly cut down the costs of space travel. Though they operate largely independently, their cooperation with governments that already have established space programs could be mutually beneficial, though legal and political concessions will have to be made prior.

# Case Studies

## Biosphere 2

In order to effectively colonize celestial bodies, a method of inhabiting them must be implemented. By observing the closed ecosystem Biosphere 2, the feasibility of space colonization can be explored.

Located in Oracle, Arizona, the laboratory is owned and overseen by the University of Arizona. The facility itself replicates seven different types of biomes found on Earth in addition to hosting habitable spaces for humans. The scientific findings that take place here cover environmental, agricultural, and psychological aspects of manmade closed ecosystems. With this, the exclusion of toxins and effects of climate change are emphasized in its studies; these are also important to consider when applying the construction of such ecosystems on celestial bodies.



## Further Research

The UNOOSA Compendium on “Mechanisms Adopted By States And International Organizations in Relation to Non-legally Binding United Nations Instruments on Outer Space” is an extensive document that may provide useful resources in researching space-related laws passed by different countries.

That document may be found here:

[http://www.unoosa.org/documents/pdf/spacelaw/Non\\_legallyb\\_mech/COMPENDIUM\\_Updated\\_31\\_March\\_2017.pdf](http://www.unoosa.org/documents/pdf/spacelaw/Non_legallyb_mech/COMPENDIUM_Updated_31_March_2017.pdf)

## Guiding Questions

1. Should colonization be an international endeavor, or should it be conducted by individual countries, independently of other nations?
2. Does the United Nations have jurisdiction outside of Earth? Will it have an influence on other planets or are new planetary governing bodies needed?
3. How can militarization in space be avoided?
4. What adverse effects can arise from colonization, both on a new planet or on Earth? How can these effects be avoided?
5. To what extent should humanity colonize other planets? Should humans aim to be a multi-planet species? Is having a “backup” planet a valuable social goal?
6. With what urgency or timeline should any space-related goals be pursued?

## ~ TOPIC 2 ~

### History

The impact of humans on Earth has only grown exponentially since the Industrial Revolution -- when, not coincidentally, mining and manufacturing processes were developed and refined to extract resources from the Earth and produce infrastructure on a massive level. While this has undoubtedly led to an average increase in life expectancy and quality of life in developed nations, the environmental impacts of mining are beginning to take their toll on the planet humanity calls home. Furthermore, the resources we've grown to depend on are finite and becoming increasingly scarce, especially non-renewable ones such as oil and coal. Yet the global population is only increasing, and people are living longer, thus requiring more resources, not less. As such, in addition to looking towards renewable energy sources and decreasing the amount of disposable plastic generated and sold, some industries are beginning to look to outer space to increase the market supply valuable goods. Scientific investigations have revealed a vast potential of untapped resources in nearby asteroids, including platinum-group metals and silicon, (rare on Earth but valuable for in electronic products), iron, nickel, cobalt, diamonds, and even water. As of now, companies such as Planetary Resources and Deep Space Industries are racing to build rockets that will be able to safely land on asteroids to extract such resources and profit off of them, potentially setting up entire mining and production plants in space. The benefits of asteroid mining wouldn't just be for Earthly uses, however. Many asteroids are an abundant source of water, which in addition to providing for astronauts, can also be refined for use as rocket fuel when broken down into its hydrogen and oxygen components. If spaceships were able to make stops along their routes and refuel on asteroids, as opposed to bringing all the fuel and water they need for the entire journey, it could drastically decrease the cost of space travel.

It's easy to see the appeal of asteroid mining, but difficult to grapple with the environmental, political, and humanitarian consequences it could have. As proven by history, mining is extremely detrimental to the environment, and can also result in political conflicts -- issues that could either be solved or worsened by asteroid mining. Furthermore, space mining could have negative effects on the economies of developing nations or those who currently rely on mining to sustain their economies, as wealthy nations become able to outsource once valuable raw materials for themselves. As the concept of asteroid mining -- once seen as mere science fiction -- becomes a reality, the past must help shape the future, and long-term risks and benefits weighted over any potential short-term gains.

### Past UN Action

According to the 1967 Outer Space Treaty, space should be used to the "benefit of all peoples irrespective of the degree of their economic or scientific development". The advantages of the use of space should not be limited to only those with access to it. Furthermore, outer space law has also idealized equality by establishing that space should be used in ways that further the United Nations' overall goals. These goals have been promoted through the encouragement of lowering the cost of space technologies and integrating them into national development plans for developing countries. While this makes space technology more affordable, the technology used for work in outer space is quite advanced and requires a high level of education from its users. If the use of mining is to be endorsed, education must also be promoted to keep the industry equitable for interested nations. Many of the goals set for use of outer space are modeled after the United Nations' goals to decrease inequality and maintain peace, and one major struggle on Earth concerns control of precious resources. Given the hostility that plagues Africa over gold, nickel, silver, and silicon, to mine these resources in space would perhaps divert power away from those who wield it violently on Earth. Furthermore, mining in space would also minimize the environmental impacts of mining on Earth and its effects on land use, providing an achievement for the UN's environmental goals.

While mining is rarely mentioned in formal UN resolutions, regulations to it are alluded to in many space treaties and objectives. Resolution A/RES/68/74 states that space activities are to be “carried out in a safe manner and to minimize risks to persons, the environment or property and that those activities do not lead to harmful interference with other space activities”. In short, any activities in space, including mining, cannot be significantly harmful to essentially anything. The Outer Space Treaty has established that while space law regulates actions of nations in space, the actions of non-governmental organizations and private industries fall under the jurisdiction of both the Treaty and their State. Thus, when pursuing mining in space, private industries must comply with both national and international regulations just as they would on Earth.

Since 1865, the International Telecommunications Union has managed the radio spectrum as a natural resource and something to be split fairly between nations. A similar body may serve to divide up space resources equally and fairly between nations. Furthermore, if mining on celestial bodies becomes commonplace, a regulating body should be considered to mediate disputes on mining rights between countries or private companies. One step towards tracking rights has been taken with the firm establishment of rules on celestial object registration. Multiple resolutions affirm the importance of maintaining national registries of objects launched into space. These registries are created not just to watch government-owned items in space, but to also track non-governmental organization activity and ownership of orbiting objects. With the help of established guidelines and management of space, future conflict can be avoided. After all, Outer Space Law leaves little doubt that militarization in space should be avoided at all costs, so conflicts in natural resource rights need to be settled peacefully through a judicial body or otherwise.

## Current Situation

While the growing scarcity of resources available on Earth has become a larger issue, national bodies and private corporations started looking at objects in space as probable alternative sources for these resources. Asteroids are especially known to contain precious metals, such as platinum and gold; the 2011 UW158 asteroid identified in 2015 was calculated to carry 90 million metric tons of precious metals alone, with an upwards estimated worth of \$5 billion US dollars. Discoveries such as this one have served as lucrative incentives for national bodies and private corporations to pursue space mining.

The technology to do so already exists to an extent. In 2014, the ESA’s Rosetta Space Mission successfully landed on the comet 67P, and analyzed parts of its surface and interior and reported back to Earth that the asteroid contained water vapor and oxygen. The current technological gap between the Rosetta Mission and large-scale space mining is the extraction and delivery back to Earth. In order to fill this gap, a significant amount of funding will be needed to develop and launch probes capable of extracting carrying massive loads for likely decades from and back to Earth. The economic viability and profit afterward are therefore questionable.

This has not stopped some nations from declaring their intent to claim asteroids for mining. In 2017, Luxembourg passed a law that allows companies to claim ownership of resources they extract from celestial bodies. This shows similarity to the US Commercial Space Launch Competitiveness Act, which also recognizes the private right to claim what is extracted from celestial bodies, including the moon. Private corporations established to mine resources on the moon, such as Moon Express and Shackleton Energy Company, intend on extracting water as alternative fuel sources to fossil fuels on Earth. This raises the question of how environmentally sustainable or beneficial these practices may be.

From a legal standpoint, these extractions may conflict with the Outer Space Treaty. In Article II, it prohibits “appropriation” of entire celestial bodies to ensure that all of space is equally accessible. However, with Russia and the United States bringing lunar material back to Earth from previous space missions, the appropriation does not limit extractions but rather claims on the entire body itself.



# Bloc Positions

## Major Space Players

As countries with strong economies, to begin with, major space players like the United States and Russia have little to lose from investing in economic activities in space. After all, building up economic dominance in space would increase a nation's overall power on Earth. Getting to space is not for the poor, however. Developing countries need support and resources from countries with established space programs. Limiting accessibility to space would benefit these developed nations, though, by giving them unimpeded access to extraterrestrial natural resources. However, the goals of both the United Nations and the guidelines of the Outer Space Treaty to decrease inequalities would be violated in spirit.

## Emerging Space Players

Historically, developing nations have been disadvantaged on the world stage when it comes to keeping up with advanced technologies. In an emerging space economy, this role stands to be reversed. With support and availability of technologies to reach space with, extraterrestrial activities may become accessible to all. African nations have especially been targeted as promising markets for space technology. Currently, the largest barrier to this future is cost: spaceflight is very costly, and without ways to make space technologies cheaper, only developed nations can benefit. Thus, developing nations are likely to be very in support of increasing accessibility to spaceflight technologies. While entering a "space economy" may be beneficial, it also may detract attention and resources from crises, economic or otherwise, on Earth. Because of this, developing nations should carefully consider the stability of their own nation and how involvement in space may be potentially harmful.

## Private Space Players

In many nations, the ownership of natural resources lies with the government. A precedent has yet to be set for space -- will private companies be given capitalistic free reign over mining and other industries, or will a more collective approach be taken regarding sharing resources and their value? In order to avoid political and legal clashes, a cohesive and concrete agreement must be formed between such companies, respective governments, and the UN body as a whole, lest eventual conflict ensues.

# Case Studies

## SPACE Act

In recent years, individual countries have begun to outline policies on claiming space resources. To name one policy, the United States SPACE Act of 2015 states that "A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States". In short, finders keepers. While international law is fuzzy on specifics, many guidelines of space treaties state that space resources should be shared or split equitable and that no resource can be "claimed". In contrast to the U.S.'s SPACE Act, Luxembourg established a framework for space resource utilization in 2017. The framework similarly directs ownership of space resources to private companies rather than to governments, establishing a very business-friendly environment. While laws like these work well for encouraging private businesses to take advantage of space, concrete details are yet to be set out in terms of international cooperation. As mining in space becomes a reality, an understanding between nations on settling ownership should be reached.

## Further Research

- <http://www.unoosa.org/oosa/en/informationfor/faqs.html>
- <https://www.space.com/30213-asteroid-mining-planetary-resources-2025.html>
- [http://www.unoosa.org/pdf/reports/ac105/AC105\\_941E.pdf](http://www.unoosa.org/pdf/reports/ac105/AC105_941E.pdf)

## Guiding Questions

1. Should the United Nations promote the use of mining in space? How so or why not?
2. What hazards may arise and how can their effects be alleviated?
3. How should ownership or rights to resources in space be divided or mediated?
4. The scarcity of resources maintains a critical balance in the economy, and asteroids provide a seemingly unlimited source of “scarce” resources. How can adverse effects to the economy as a result of space mining be mitigated?