United Nations Office of Outer Space Affairs (UNOOSA)

Humanity's Future Beyond Earth: Discussing Commercialization, Exploration of Resources, and Human Settlement in Outer Space

CHAIRS

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1. COMMITTEE DESCRIPTION

1.1. WHAT IS THE UNOOSA?

The United Nations Office of Outer Space Affairs (UNOOSA) is a specialized office within the United Nations Secretariat responsible for promoting international cooperation in the peaceful exploration and use of outer space. It was set up by the General Assembly in 1958 to govern the exploration and use of space for the benefit of all mankind, regarding themes such as peace, security and development. UNOOSA is tasked with reviewing international cooperation in peaceful uses of outer space, encouraging space research programmes and studying legal problems that may arise from the exploration of outer space.

Moreover, this office also serves as the secretariat to the Committee of Peaceful Use of Outer Space (COPUOS). The UNOOSA played a significant role in the creation of the five space law treaties, and by discussing the global development goals yearly considers the international cooperation in space exploration and the use of space technology application. Therefore, in response to the rapid advances in space technology, the committee provides a unique platform at a global level to monitor and discuss such developments.

In addition, UNOOSA promotes international collaboration in space research and the application of space technologies to address global challenges. Through its work with COPUOS, and its two subsidiary bodies, the office helps facilitate dialogue among member states on emerging legal, technological and governance challenges related to space exploration. The committee reports to the UNGA Fourth Committee, which annually adopts resolutions on international cooperation in the peaceful use of outer space.

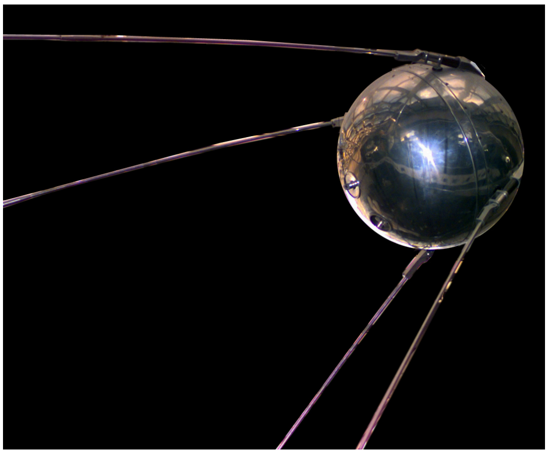
2. HISTORICAL CONTEXT

Since the dawn of time, humans have been looking at the stars, hoping one day they could venture and understand more about what is now known as Outer Space. From ancient documentation made by the Assyro-Babylonians regarding astronomical observations, to Galileo Galilei's first use of a telescope for astronomy in 1609, it is clear that humanity's connection with space has existed for many millennia. However, it was only in the 20th century (more precisely, on October 4, 1957, with the launch of Sputnik 1) that humanity moved from simply watching the night sky to finally venturing into it, transforming the vast unknown into a real frontier where we could physically explore.

2.1 ORIGINS OF SPACE EXPLORATION (SPACE RACE | 1950s - 1970s)

The origins of modern space exploration are deeply rooted in the geopolitical tensions of the Cold War, a period of intense ideological, technical and military rivalry between the United States (US) and the Union of Soviet Socialist Republics (USSR). As both superpowers aimed to expand their global influence and demonstrate the superiority of their own political systems, scientific and technological achievements became powerful tools of international prestige and strategic advantage. One example of this was the Arms Race, which was an intense competition between both nations to develop superior conventional and nuclear weaponry. In this context, advancements in rocketry (which were originally being developed for military purposes, with the main example being Intercontinental Ballistic Missiles) quickly gained significance beyond Earth's Atmosphere. The ability to launch objects into orbit implied both scientific progress and the threat of satellites and weapons traversing national borders, without a plane nor a ship.

The starting point of humanity's exploration of outer space was on October 4, 1957, which was when the USSR launched Sputnik 1, the first artificial satellite to successfully orbit Earth. This marked a turning point, shocking the international community and starting the Space Race, which is considered to be the period in history in which most investments were allocated for the purpose of space related technology development.



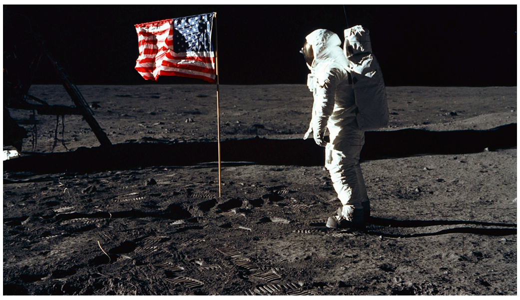
After the launch of Sputnik 1, the competition between the US and USSR rapidly intensified, transforming the Space Race into one of the most prominent aspects of the Cold War rivalry. Even though the Space Race can be regarded as a type of power show off between the two superpowers in the world, trying to impress the non-aligned countries, there was still concern regarding national security and how all of this exploration reshaped global perceptions of space as a new strategic domain.

It is notable how the USSR had a way better and more consolidated start regarding space exploration, with the launch of the first successful artificial satellite (Sputnik 1), followed by the first launch with a living being inside just short of a month before its first successful mission (Sputnik 2, which was launched on November 3, 1957, and flew to Outer Space with the dog Laika aboard). In response to the perceived technological gap revealed by both Sputnik missions, the US significantly increased funding for scientific research and education, establishing NASA (National Aeronautics and Space Administration) in 1958 to coordinate its space program. Although both superpowers went on to demonstrate technological and ideological superiority during a period of escalating achievements, the USSR initially maintained its lead by launching the first human, Yuri Gagarin, into orbit in 1961.

With the heightened political pressure and the rapid development of the USSR regarding space exploration, President John F. Kennedy responded by announcing the ambitious goal of landing a man on the Moon before the end of the decade through his famous 1962 speech: “We choose to go to the moon. We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too.”

This objective shaped the direction of both nations' space programs throughout the 1960s. The US focused heavily on bettering and advancing human spaceflight capabilities through programs such as Mercury (1958-1963) and Gemini (1965-1966), which were consecutively developed to test the limits of human endurance in space, developing spacewalking techniques and perfecting orbital maneuvers necessary for a lunar mission, all while investing into the necessary technology. Meanwhile, the USSR continued to achieve major milestones, including long-duration spaceflights, further advancements in rocket technology, being able to launch the first multiperson spacecraft (Voskhod 1, 1965) and to perform the first space walk (Voskhod 2, 1965).

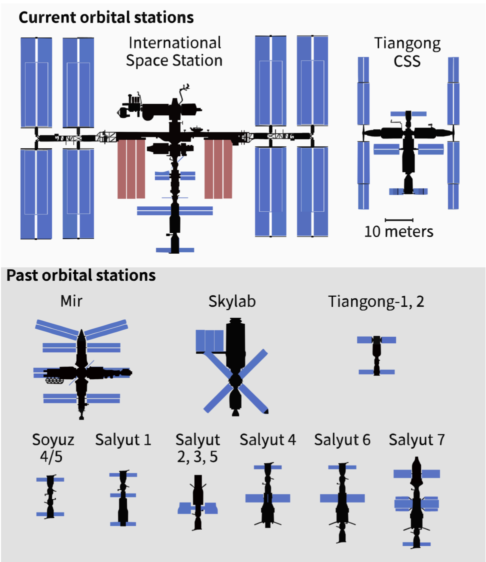
Shortly after, the US sought to finally reach the moon through one of the most famous space programs to this day, the Apollo program (1962-1972). After many uncrewed (AS-201, AS-202, AS-203, Apollo 4, 5, 6) and crewed (Apollo 7, 8, 9) flights made to test the technology that was developed to reach the moon (flight module, lunar orbit rendezvous, Saturn IB and Saturn V), the rivalry ultimately culminated in the historic achievement of Apollo 11, when the United States successfully landed astronauts on the Moon on July 20, 1969. The mission, commanded by Neil Armstrong (who became the first human to walk on the lunar surface) alongside Buzz Aldrin, represented a decisive symbolic victory for the US in the Space Race.



2.2 EVOLUTION OF SPACE ACTIVITY (POST SPACE RACE | 1970s - 1990s)

Even though the Apollo 11 mission and the first moon landing represented a symbolic victory for the US, the Space Race is generally considered to have ended on July 15, 1975, with the Apollo-Soyuz program, in which a successful docking of the American Apollo and Soviet Soyuz spacecraft occurred. This mission saw Commanders Tom Stafford and Alexei Leonov exchanging the first international handshake in space, and it symbolized a shift from intense Cold War competition to international cooperation.

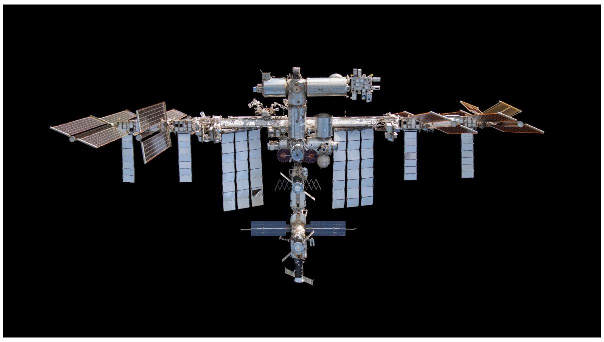
Some achievements worth talking about, even though they happened in an era in which the space race had not fully ended, are the space stations launched into orbit, with the first ones being the Salyut Series (1971-1986) and Skylab (1973-1979). Furthermore, after the Space Race ended, other space stations and laboratories were developed and sent into orbit, such as Mir (1986-2001), Tiangong 1 and 2 (2011-2019) and the most famous ones, which are still active to this day: International Space Station (ISS | 1998-Present) and Tiangong Space Station (TSS | 2022-Present). These space stations and laboratories have allowed humans to research different topics in space and conduct many breakthroughs in modern technologies, as will be discussed later when talking about the most current space stations (mainly ISS).



After the Space Race had ended, the US sought to develop one of its most ambitious programs to this day: the Space Shuttle Program (1981-2011). The Space Shuttle Program was an initiative that aimed at the development of a (partially) reusable spacecraft, thus aiming to make space more accessible and enable routine transportation for Earth-to-orbit crew and cargo. The Space Shuttle, composed of an orbiter launched with two reusable solid rocket boosters and a disposable external fluid carried up to eight astronauts and up to 23,000 kg of payload into low Earth orbit. It flew 135 missions and carried 355 astronauts from 16 different countries, many on multiple trips. This was undoubtedly one of the most incredible and successful programs developed by NASA, as the Shuttle was the only winged crewed spacecraft to have achieved orbit and landing, while also being the first reusable crewed space vehicle. Its missions involved carrying large payloads and crew to various orbits, such as deploying and recovering satellites on orbit and performing crew rotation on ISS. It also made service missions on the Hubble Space Telescope. After 30 years, the Space Shuttle Program became too costly and complex to sustain, so the program officially ended on July 8th, 2011, with the final flight being STS-135.

The shuttle program demonstrated how human spaceflight could move beyond “flags and footprints” (As seen in the Space Race, in which space was considered as just a goal) toward permanent occupation, scientific research and complex orbital construction, allowing for extensive research, such as in biological and physical sciences in Earth's orbit, with the exploration of effects in gravity-free environments. This shift of mindset is something that reflects to this day in space exploration.

Moreover, one of the main events that also showed this shift towards global cooperation and research in space, was the construction of the International Space Station (ISS | 1998-Present). It represents one of the most significant achievements of international cooperation in space exploration and marks a major transition from Cold War rivalry to collaborative space governance. The ISS was created from a partnership between the US (NASA), Russia (Roscosmos), Europe (ESA), Japan (JAXA) and Canada (CSA). It orbits earth at approximately 400 kilometers above the surface since the launch of its first module in 1998 and it serves as a permanently inhabited microgravity laboratory, where astronauts conduct scientific research in fields such as medicine, materials science, climate monitoring and space technology development. Its continuous human presence since 2000 represents humanity's longest uninterrupted occupation of space, providing critical knowledge about physiological and psychological effects of long duration spaceflight, which is essential for future missions to the Moon and Mars.



At the same time, the station highlights emerging challenges relevant to modern space policy debates, including dependency on multinational cooperation, high operational costs, commercialization through private companies and questions regarding the future of orbital infrastructure as the ISS approaches retirement.

2.3 SPACE LAW TREATIES

To prevent the militarization of outer space, while also managing geopolitical tensions and ensuring peaceful space exploration, after the 1957 launch of Sputnik, the UN COPUOS (Committee on the Peaceful Uses of Outer Space, which the UNOOSA is a subcommittee of) sought to establish a legal framework to ensure that space benefited all of humanity. For this to be achieved, throughout many years since the beginning of space exploration, five main international space law treaties have been established:

2.3.1 Outer Space Treaty (1967):

The Outer Space Treaty was the first one to be established, and provided a basic framework on international space law, defining space as the "province of all mankind”, allowing free exploration and forbidding national appropriation, nuclear weapons in orbit or military bases in celestial bodies. Some of the principles it included were:

- The exploration and use of outer space shall be carried out for the benefit and in the interests of all 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;
- States 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;
- States shall be responsible for national space activities whether carried out by governmental or non-governmental entities;
- States shall be liable for damage caused by their space objects; and
- States shall avoid harmful contamination of space and celestial bodies.

2.3.2 Rescue Agreement (1968):

The Rescue Agreement states that States should take all possible steps in their power to rescue astronauts in danger, and return them to the launching State. Moreover, States should also, upon request, provide assistance to others in recovering space objects that return to Earth in a territory outside of the launching state.

2.3.3 Liability Convention (1972):

The Liability Convention provides that a launching State needs to be absolutely liable to pay compensation for any damage caused by its space objects on the surface of the Earth or to aircraft, while also being liable for damage caused by its faults in space.

2.3.4 Registration Convention (1976):

The Registration Convention mandates that nations register all objects launched into outer space with the UN, ensuring full and open access to the information provided by States and international intergovernmental organizations.

2.3.5 Moon Agreement (1979):

The Moon Agreement reinforces and further elaborates on many of the provisions of the Outer Space Treaty applied to the Moon and other celestial bodies. Furthermore, this agreement mainly states that the Moon and its resources are a common heritage of mankind, establishing an international regime to manage the exploitation of such resources.

2.3.5 Important Factors

Some important notes about these treaties (especially the Outer Space Treaty) is that there are many loopholes present, such as never banning conventional weapons in outer space, or never accounting for technologies that were developed after the creation of treaties. Moreover, the treaties fail to specify certain specific uses and cases of the celestial bodies (such as what qualifies as a "peaceful use") and fail to address private and commercial initiatives regarding the exploration of space and these celestial bodies.

3. CURRENT SITUATION

Over the past decades, outer space has been a major subject of international attention, as demonstrated by the numerous unmanned and crewed missions conducted throughout the entire space exploration history. Historically, the majority of space activities have been state-led, reflecting geopolitical and scientific priorities of governments. However, currently, we are beginning to see a growth in the commercialization of space and how this marks a new era for the human race; an era where humans are becoming increasingly capable of expanding beyond Earth, exploring the far reaches of the cosmos. This shift represents a transition from state-driven exploration to an emerging orbital and interplanetary economy, in which private actors play an increasingly central role in satellite infrastructure, resource extraction and the development of technologies necessary for long-duration space travel and extraterrestrial settlement. As launch costs plummet and technology advances, space is no longer a distant laboratory for a select few, but a new frontier for industry and a possible permanent extension of human civilization beyond Earth.

3.1 COMMERCIALIZATION OF OUTER SPACE (2000s - Present)

The early 21st century marked a big shift in space activity with the rapid commercialization of space. Characterized by the growing role of private companies, during the last one or two decades, governments (particularly NASA) began partnering with private initiatives to reduce costs, while also stimulating innovation and expanding access to space. companies such as SpaceX, founded in 2002 by Elon Musk, and Blue Origin, founded in 2000 by Jeff Bezos, pioneered reusable rocket technology (such as the rocket catching mechanism “Chopsticks”, which are designed to catch the 232-foot-tall Super Heavy booster as it returns to the launch pad, allowing for rapid reuse), dramatically lowering the cost of launches and reshaping economics of spaceflight. To put into perspective how incredible of a feat SpaceX is doing in the space industry, in 2025, the US conducted 181 orbital launch attempts, in which 170 were completed by SpaceX. And it is important to note how it is expected that this number will only grow, thus demonstrating the sheer magnitude of their operational dominance in space activity. The company's development of Falcon 9 and Dragon enabled commercial cargo and human transport to the ISS, marking the first time private companies carried astronauts into orbit.

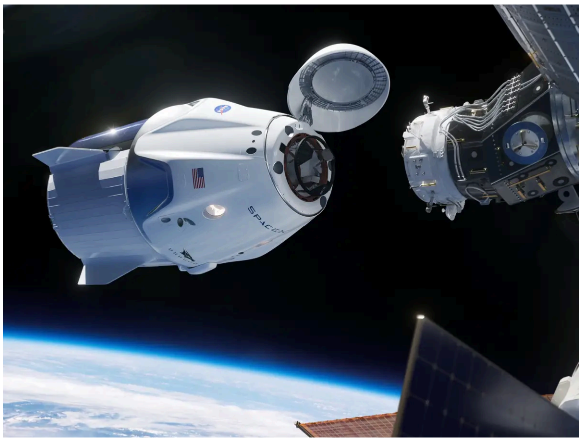
This period also demonstrated an expansion to commercial satellite industries, space tourism initiatives and early plans for private space stations and asteroid mining, which reflects even more the shift of state-dominated exploration towards market-driven activity. However, while this commercialization accelerated technological progress and access to space, it also introduced new governance challenges, which include regulatory oversight, resource ownership, environmental concerns (such as orbital debris) and questions regarding the equitable distribution of space access and distribution of resources.

With private companies, such as SpaceX and Virgin Galactic, well established, the private sector already looks to dominate this new industry, which can be categorized into four main business models: Space tourism, intercontinental travel on Earth via space, transport to private or governmental owned vessels (such as, but not limited to, the ISS) and corporate sponsorship from companies not involved directly with space travel. As of 2026, other business models can also be identified, for example the data market with the popularity of SpaceX's Starlink, and also defense and sovereignty enforcement.

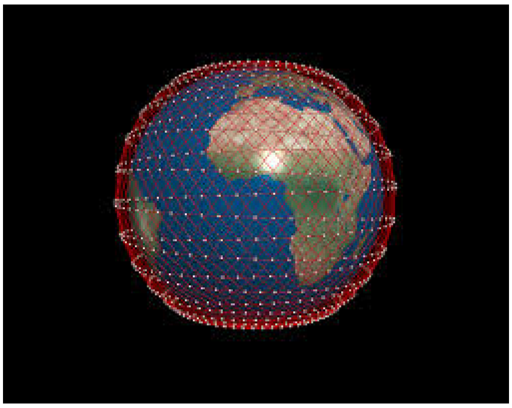
3.1.1 Space Tourism

The modern meaning of "commercializing space" has a broad reliance on the idea of space tourism and transport. Space tourism itself consists of bringing paying customers into space, which might become one of the most profitable measures of space commercialization. Since 2013, Virgin Galactic has been offering suborbital flights, which has marked the beginning of a new era of space tourism and shown the viability of it. Currently, the program is paused, but is to be returned before 2027. The early stages of space tourism will consist of what is being done by companies such as Virgin Galactic, which are these types of suborbital flights. However, it is expected that the next step will be staying in space for extended periods of time on commercial space stations. One of the biggest examples are the Axiom Station (designed by Axiom Space and the Orbital Reef (designed by Blue Origin), which are being developed to be used as both research and tourism points.

3.1.2 Transport



Another major effect of space commercialization is the transport of people, cargo and services to and between orbital platforms. The commercialization of transport covers two linked topics, which are the launch of goods and people to private or government owned stations, and the development of commercial infrastructure (most notably broadband and data networks). With NASA's Shuttle Program retirement in 2011, the ability of the American government to launch astronauts to space was practically over, thus making it so that NASA astronauts had to utilize the aid of the Russian government's Soyuz spacecraft. This quickly changed when SpaceX entered the market, which revolutionized it by operating as a private contractor to transport personnel. Since 2020, SpaceX has been operating the Crew Dragon capsule and the Falcon 9 rocket as a means of providing transportation as a service, rather than just building hardware for the government. Furthermore, the expansion of commercial infrastructure is fundamentally shifting how data is managed and transmitted globally. Projects like Starlink (operated by SpaceX) have pioneered the use of low-Earth orbit satellite constellations to provide high speed internet to remote regions. Also, the industry is now moving towards the development of orbital data centers, which aim to reduce the burden on terrestrial networks and optimize space, thus turning the orbit into a vital extension of the world's digital economy.



3.1.3 Environmental Issues

Although there are many benefits to an increase in space commercialization, there are still many negative factors that may come with it. Alongside issues regarding safety and practicality, the biggest concern with increased commercialization of space is the environmental impact, with there being a general concern regarding the increase of rocket launches. This concern is primarily driven by the injection of pollutants directly into the stratosphere, a region that lacks the weather patterns necessary to expel these contaminants. For example, the abundant use of rocket-grade kerosene in current spacecraft, produce significant amounts of black carbon, which can remain in the extreme altitudes they are released in for years, thus absorbing heat and contributing to global warming. Furthermore, even though the industry is starting to shift towards cleaner liquid methane engines, the risk of methane slippage (unburn fuel escaping into the atmosphere) poses a new threat as well.

Moreover, beyond the chemical composition of the exhaust, the sheer volume of launches required, for example, for mega constellations (such as Starlink) leads to a considerable amount of space debris. As low-Earth orbit becomes increasingly crowded the probability of collision rises, thus enabling the possibility of generating even more fragments if a collision really occurs. This orbital pollution threatens future scientific missions, while also risking the existing infrastructure that many humans rely on (such as GPS, weather forecasting and global communications).

3.1.4 Equity & Access

Commercialization also raises urgent questions about who benefits from the space economy and how access to space applications and resources can be shared equitable among states and peoples. Historically, even though space was deemed a “province of all mankind” by the 1967 Outer Space Treaty, space activity has been concentrated in a small group of technologically advanced countries. Currently, the fast privatization and commercialization of all space activities risk the further concentration of outer space if measures are not adopted to promote inclusion. Practical measures are already under discussion, with some examples being scaled capacity-building and technology transfer, commitments to open access for selected scientific data and targeted opportunities for emerging nations to secure an equitable access to space and international agreements. Embedding equity into regulation will help ensure that the growing economic value of space advances sustainable development broadly instead of just concentrating it among a few actors.

3.2 RETURN TO THE MOON & SPACE SETTLEMENT PLANS (2020s - Future)

Since the beginning of this decade, there has been a deliberate shift on how the Moon is talked about by different states, with there being a global focus on it as the next strategic and technological destiny in human space exploration. Unlike the Cold War, in which lunar missions were primarily symbolic demonstrations of power, contemporary lunar initiatives are being made as the foundation for a prolonged human presence beyond earth. The Moon is being increasingly viewed as a destination and a ground for long-duration habitat systems, in-situ resource utilization techniques (ISRU) and logistical architectures and plans that might be applied later to Mars and other deep-space missions. Moreover, there is also a big incentive to develop habitat systems on the moon. As such, launches to Mars (and possibly other bodies of interest) could be made more frequently and with less resources, as opposed to the launches on planet Earth. Furthermore, it is noteworthy how, even though the Moon and human settlement in it is surely an incredible feat, and a milestone to be reached, it still functions as both a rehearsal and a political test for any attempt at further space exploration development.

Following this train of thought, the 2020s have marked a renewed and structured return to the Moon, led primarily by NASA's Artemis program, a long-term initiative designed to not just revisit the lunar surface, but aiming to establish a sustainable human presence. As stated by Nasa, “We’re going back to the Moon for scientific discovery, economic benefits, and inspiration for a new generation of explorers. While maintaining American leadership in exploration, we will build a global alliance and explore deep space for the benefit of all.”. Unlike the Apollo missions of the 1960s and 1970s, which were brief and, as stated before, largely symbolic demonstrations of technological capability, Artemis is aiming to be the stepping-stone towards permanent infrastructure, resource utilization and eventual crewed mission to Mars. The program envisions a phased approach: Artemis I successfully tested the Space Launch System (SLS) and Orion spacecraft in an uncrewed lunar flight in 2022. Now, we are currently in the Artemis II mission, which can be compared to the Apollo 8 mission: it aims to make a crewed flight with the intention of orbiting the Moon. One interesting fact is that this mission is the first crewed mission to take a woman, a person of color, and a non-American (Canadian) on a journey around the moon. Thereafter, Artemis III aims to send the first humans to explore the region near the lunar South Pole and the permanently shadowed, which is a region of high scientific and strategic interest due to the confirmed presence of low quantities of water. Then, Artemis IV will debut humanity's first lunar space station and a new mobile launcher, and more Artemis missions are being planned to further explore and develop the idea of human settlement and resource utilization on the Moon.

Moreover, Artemis represents a new model of space governance and cooperation. Through the Artemis Accords, participating states commit to principles such as transparency, peaceful use, emergency assistance and the responsible extraction of space resources (which can be basically categorized as a reinforcement of the already existing treaties). However, the Accords are political commitments as opposed to binding international treaties, and not all major spacefaring nations are signatories. This can result in a return to the Moon within a multipolar landscape, raising questions about coordination and the risk of fragmented regulatory standards.

As noted above, one important fact to have in mind is the prospect of accessible water ice on the moon, which was discovered in permanently shadowed regions at low concentrations across the surface. This is a very important advance, because this resource can be processed into drinking water, breathable oxygen and even rocket propellant. The ability to harvest and manufacture these basics on the Moon could transform mission design by sharply reducing the mass and cost of resupply from the Earth. For that reason, NASA and other agencies prioritize ISRU technology development and polar prospecting as preconditions for any long-duration base.

Private industries are now also intrinsic partners in plans for the Moon: Landers, cargo, logistics, habitat prototypes, lunar space stations and many ISRU experiments are being proposed and/or developed by commercial firms working under contracts or partnerships with space agencies. For example, under the framework of NASA's Artemis programs, commercial companies are responsible for critical mission components (these which were once exclusively designed and operated by national agencies). SpaceX, for instance, is developing the Human Landing System variant of Starship, that will transport astronauts from lunar orbit on the surface during Artemis III.

Beyond the Moon, all of the current initiatives and programs are also preparations for human missions to Mars and eventual interplanetary settlement. There are many technologies which are still being developed and refined, such as long-duration life support systems, radiation shields, autonomous construction methods, recycling systems and ISRU technologies, which must be tested in the nearby lunar environment before deeper space habitation can be made viable. While permanent extraterrestrial colonies are still technologically and economically complex, advances in this industry have made sustained off-Earth presence something more reachable to the human species.

3.3 POSITION OF MAJOR POWERS

3.3.1 United States of America

The United States is currently the most influential actor in modern space activity, combining advanced government programs with a powerful commercial sector. Through initiatives such as the Artemis program, the United States aims to establish a sustainable human presence on the Moon as a stepping stone toward Mars exploration. Its space policy strongly promotes public-private partnerships, with companies such as SpaceX, Blue Origin, and others playing central roles in launch services, satellite infrastructure and future lunar systems. The U.S. also supports the Artemis Accords as a framework for international cooperation, emphasizing transparency and responsibility. However, its interpretation that resource utilization is compatible with the Outer Space Treaty has sparked debate among states that fear commercialization could lead to unequal access to extraterrestrial resources.

3.3.2 Russia

Russia remains one of the historic leaders in space exploration, inheriting the legacy of the USSR's early achievements during the Space Race. Russia continues to maintain strong technical capabilities in human spaceflight and launch systems, and has been a long central partner in the ISS program. In recent years, Russia has increasingly emphasized strategic independence, pursuing closer cooperation with China in developing alternative exploration initiatives. These include plans for the proposed International Lunar Research Station. Russian policy generally favors a more state-led model of space development and has expressed skepticism toward governance frameworks perceived as dominated by Western powers. Consequently, Russia often advocates for stronger multilateral agreements and clearer international regulation regarding space resources and commercial activity.

3.3.3 China

China has rapidly emerged as one of the most ambitious and capable spacefaring nations, significantly expanding its exploration programs over the past two decades. Through its Chang'e lunar missions and the development of its own space station, China has demonstrated increasing technological independence and long term strategic planning. China has also partnered with Russia to develop the International Lunar Research Station (as mentioned before) as a potential alternative framework for lunar exploration and settlement. Unlike the highly commercialized model favored by the United States, China's space program remains primarily state-driven, though private companies are beginning to play a growing role domestically. In international governance discussions, China often emphasizes sovereignty, equitable participation for developing nations and the importance of multilateral decision-making in shaping the future of space activities.

3.3.4 European Union

The European Union and its member states play a major role in global space governance through close cooperation with the European Space Agency (ESA), which coordinates many of Europe's major exploration, satellite and research programs.. European space policy is generally characterized by a strong emphasis on multilateral cooperation and the rule of international law in outer space activities. While Europe participates actively in international exploration initiatives (including contributions to the Artemis program), European states often impose the importance of maintaining outer space as a shared domain accessible to all countries. THe EU has also invested heavily in independent space programmes, such as the Galileo and Copernicus Programme. In international discussions, European states often advocate for stronger regulation of space debris and inclusive and equitable governance frameworks.

3.3.5 Japan

Japan is one of the most technologically advanced space actors and a key partner in several international missions. Through the Japan Aerospace Exploration Agency (JAXA), the country has developed highly sophisticated robotic exploration systems, satellite technologies and asteroid sample-return missions. Japan is a major contributor to the Artemis program and on the ISS, and it is expected to play an important role in the development of lunar infrastructure and robotic surface operations. In governance discussions, Japan generally supports cooperative international frameworks, emphasizing responsible technological development. Moreover, it also advocates for peaceful exploration and the integration of emerging technologies such as robotics and artificial intelligence into future space missions.

3.3.6 India

India has rapidly expanded its space capabilities in recent decades and is increasingly being recognized as a leading emerging space power. Through the Indian Space Research Organisation (ISRO), India has achieved significant milestones such as lunar exploration missions (the most notable being Chandryaan-3, 2023, which made India the first nation to soft-land near the lunar South Pole) and cost-effective satellite launch technologies. India often emphasizes affordability and accessibility in its space program, promoting the idea that space exploration should benefit a broad range of nations rather than only the most technologically advanced ones. As its capabilities grow, India is expected to play a larger role in shaping global discussions about resource utilization, space governance and international cooperation in exploration missions.

3.3.7 United Arab Emirates

The United Arab Emirates represents a new generation of rapidly developing space actors that have entered the field through strategic investment and international collaboration. Through the UAE Space Agency and projects such as the Hope Mars Mission, the country has demonstrated a commitment to scientific research and technological development. The UAE also seeks to position itself as a regional hub for space innovation and commercial activity. In international discussion, UAE often emphasizes international partnerships and the use of space exploration as a driver for economic diversification and technological advancement.

3.3.8 Brazil

Brazil plays an important role as one of the largest space-capable nations in Latin America and as a representative voice for many developing countries in discussion about equitable access to space. Through the Agência Espacial Brasileira (AEB), the country has participated in satellite development, Earth observation programs and international launch partnerships. Brazil frequently advocates for the principle that outer space should remain accessible to all nations, emphasizing capacity building and fair participation in exploration initiatives. In debates about commercialization and resource extraction, Brazil highlights the need to ensure that emerging space fairing economies do not exclude developing nations from the benefits of space exploration.

4. GUIDING QUESTIONS

1. How effective are existing treaties (such as the Outer Space Treaty of 1967) in regulating modern-day and future space activity, and what loopholes of these treaties must be addressed to ensure a safe and equitable space exploration?

2. What are the technological and logistical challenges to establishing permanent human settlements in space while also protecting both humans and extraterrestrial environments from harmful impacts?

3. How can nations and private agents prepare for the governance challenges of large-scale space settlement, and also regulate rapidly advancing technologies (such as AI, robotics, and mining drones)?

4. How can small or emerging spacefaring nations participate fairly in space exploration initiatives, ensuring it is an equitable process, where no nation is left behind?

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