URGENCY FOR REGULATION IN SPACE LAW

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ABSTRACT

Space law refers to the set of international regulations governing the use and exploration of outer space. It has its roots in the post-World War II era and the beginning of the Cold War, as well as the development of nuclear weapons and the realization that outer space could be used as a potential medium for weapons and missile use. The most widely used treaty in space law is the Outer Space Treaty of 1967, which emphasizes cooperation and peaceful use of outer space and holds nations accountable for any missions they undertake. Subsequent treaties, such as the Rescue Agreement of 1967 and the Liability Convention of 1972, have established guidelines for rescuing and assisting space personnel, as well as defining the responsibilities of nations for damages caused by their space missions. Other agreements, such as the Moon Agreement of 1979, have addressed the issue of resource exploitation and the regulation of satellites, respectively. These treaties and agreements serve to foster cooperation and responsible behavior among nations in the use of outer space. Despite these regulations, the rapid growth of science and technology, as well as increasing commercial space endeavors, have created new challenges for the field of space law, highlighting the need for continued updates and changes to international agreements.

Introduction

Humans have always been curious about the natural world around them. Even our cave-dwelling ancestors wondered about nature, from the infinite to the infinitesimal. Even the earliest civilizations gazed up at the night sky and asked profound questions such as "Are we alone in the universe?" and "What are the stars made of? Are they other suns with other worlds like our own?"

Approximately two and a half thousand years later, we've evolved into a species asking the same questions, but now equipped with better tools. The explosion of the use of science and technology which took place after the Industrial Revolution accelerated development in almost every field. We've made advances in the fields of medicine, artificial intelligence, environmental studies, agricultural sciences and much more. But with these advancements, our species has also been able to misuse science and technology. For example, we can use nuclear power to power electrical generators without polluting the environment but it can also use it for an atomic bomb, causing destruction on a catastrophic level.

This is where regulation is needed. There need to be restrictions on the use of modern science and technology. This is easier said than done. The growth of science and technology was not a gradual change but occurred quite rapidly. Unfortunately, in many areas, we didn't react on time.

This is where regulation pertaining to space law comes into place. Before we get into the use of regulation, it is important for us to understand the history of space exploration by mankind as we can use it to forecast the future of spaceflight and understand what regulation needs to come into place.

It starts with the end of World War II, which marked the beginning of the Cold War between the capitalistic United States of America and the communist Soviet Union. With the Cold War, the Space Race began. On the 4th of October, 1957, the USSR launched Sputnik 1, the first artificial satellite to be launched into low earth orbit. In response to this, the United States of America created NASA (National Aeronautics and Space Association). The USSR also sent the first human to space on the 12th of April, 1961. Thus began a vindictive battle between the two superpowers which ultimately led to Neil Armstrong landing and setting foot on the Moon on July 20th, 1969. It also laid the foundation stone to the International Space Station in 1998.

THE ORIGINS AND TREATIES RELATED TO SPACE LAW

The earliest record of a statute related to the use of outer space can be traced back to Article 1 of the Chicago Convention signed in 1944 which states "The contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory".[1]

However, the most significant and widely used treaty regarding Space Law was signed on January 27th, 1967. This is known as the **Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies** or the **Outer Space Treaty.** In the 50s and 60s, there was a need for a treaty on the use of outer space as the development of nuclear weapons continued and countries began seeing the possibility of using outer space as a potential medium for the use of missiles and other weapons. This was at a time when space exploration was very real and a highly developing field. The United Nations, in turn, formed the **Committee on the Peaceful Uses of Outer Space** (**COPOUS**) whose main task was to ensure that the use of outer space by countries would only be for peaceful objectives and to also look over all legal issues and disputes arising between nations regarding the use of outer space. On 10th October 1967, the treaty came into effect.

Article 1 of the treaty essentially removes discrimination on the basis of countries and states that the use and exploration of outer space is free and open to all, provided it is in accordance with international law. The subsequent articles reinforce this idea, with Articles 2 and 3 stating that no nation will be allowed to claim any part of outer space. It also underscores the fact that astronauts are seen as a representation of all mankind and not just the nation he/she belongs to. Article 4, however, may be one of the most crucial articles in the treaty, stating that parties to the treaty shall not use or test nuclear weapons or any other weapons of mass destruction in outer space. The true message the treaty conveys is one of mutual cooperation, reciprocity and the promotion of space exploration for peaceful and conflict-free purposes. At the same time, it reinforces the fact that each country is liable for any missions they should choose to undertake, be it public or private. Today, 111 countries are parties to this treaty and it's still the leading treaty on space law today.

Article 5 of the Outer Space Treaty mentioned that countries needed to recognize astronauts as envoys of mankind and provide assistance but with increasing manned missions and no clear

[1] Convention on International Civil Aviation, 1944, art. 1.

definitions, greater specificity was required. In 1967, the **Rescue Agreement** was created. This agreement's objective was for countries to provide assistance to astronauts, regardless of where the astronaut launched from and with which nation. Article 5 of the Outer Space Treaty never clearly stated the definition of an "astronaut". Article 2 of the Rescue Agreement uses the term "Space Personnel" instead. Additionally, Article 5 of the Rescue Agreement mentions the guidelines for personnel who are stranded or needed to be rescued in a place outside any jurisdiction (Eg. Oceans or seas). It also mentions that a country can dispose of any component or space material that they deem to be harmful. Finally it also specifically mentions that any cost incurred in a rescue will be borne by the launching authority. These were meant to add more detail to the Outer Space Agreement. The agreement, however, garnered criticism. The term "Space Personnel" was never defined. Today, we send more than astronauts to space. In 2021, A Russian film crew was sent to low earth orbit. Additionally, with the growth of space tourism, many non-trained individuals have been sent to outer space. The vague definition could create opposing interpretations, potential disagreements, arguments and questions.

The next major agreement was signed in 1972 and is known as **The Space Liability Convention.** The agreement was meant to expand on Article 7 of the Outer Space Treaty which dealt with the liability and damages of space travel. Article 2 of the Space Liability Agreement states that a launching State is responsible and liable to compensate for any damage that is caused by a space object or component. Article 3 states that if any damage is caused in outer space to a launching state's object due to another launching state or authority's object, then the latter is responsible for the damage caused and is liable to pay compensation if fault can be found. Article 4 states that if a third party/launching party's space component is damaged due to two other State Parties, the two parties are both held responsible and liable to compensate the third party. This raises questions as to how fault can be proved in outer space. The agreement also holds both parties responsible for any damage that occurs in a joint mission. Most importantly, the agreements allows States to claim damages to one another and through diplomatic channels, settle cases which would otherwise lead to disputes. It should be noted, however, that only States can claim damages and not individuals under the Liability Convention.

This was practically used in 1977, when a Russian satellite known as **Kosmos 954** malfunctioned and, a year later, scattered radioactive material over Canada. Under the terms of

the Liability Convention, the Soviet Union was entitled to compensate Canada for the damages caused. The USSR ultimately paid $3,000,000.[2]

In 1976, the **Registration Convention** was signed. This was due to the fact that States required assistance on identification of space objects. Article 2 states that any object launched by a launching party must be registered in a registry. Article 3 states that the Secretary-General of the United Nations shall also maintain a register in which information must be recorded. Article 4 of the convention states that information such as the name of the launching state, the designator, the date and location of the launch, the basic orbital parameters and the function of the space object be known to the General-Secretary of the United Nations.[3]

In 2007, certain other provisions were created such as the time reference, the units to be used for orbital parameters, the geostationary orbit location and other details regarding the reentry or disposal of the object. This is extremely crucial today as a major issue arising out orbiting satellites is the large amount of space debris accumulating in outer space as a result of satellite launches and spacecraft. Presently, space debris is increasing at an alarming rate.

The final major treaty signed in 1979 is known as the **Moon Treaty**. The objectives of this treaty are similar to that of the Outer Space treaty which is to promote the peaceful use of outer space, the Moon and other celestial bodies. The most significant change, however, was that it proposes a proper framework of laws when it comes to celestial bodies. It also mentions the use of natural resources on the Moon and other celestial bodies to be used by any State. The provisions of the Moon Treaty are extremely vague and are interpreted differently by all. Rather than set proper regulation, it acts as a basic guide on how laws can be framed for the use of outer space. For these reasons, the Moon Treaty failed. It was not ratified by any major spacefaring nation and only 18 nations are parties to the treaty.

In addition to these treaties, the United Nations adopted 5 major principles and legal declarations regarding the use of space.[4]

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

[2] Marietta Benkö, Space law in the United Nations 49-51.
[3] The Convention on Registration of Objects Launched into Outer Space, 1976, art. 4.
[4] Space Law Treaties and Principles, UNOOSA, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html

- The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (1982).
- The Principles Relating to Remote Sensing of the Earth from Outer Space (1986).
- The Principles Relevant to the Use of Nuclear Power Sources in Outer Space (1992).
- The Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (1996).

MODERN ISSUES WITH SPACE LAW

The above treaties and principles try to encompass all possible issues and subjects when it comes to the use and exploration of outer space. However, when you have a field that is growing at an incredible rate, the rate at which you govern and regulate that field is crucial.

Over the past few years, new concepts have come up which are vaguely mentioned (if mentioned at all) in the space treaties. These include:

- **The advancement of space tourism** is now a real concept. Many low orbital spaceflights have occurred carrying tourists and non-trained individuals to space. Though space tourism is hailed by many in the industry, it is a rapidly growing field and in the near future, the capacity to go into outer space will be available to a large number of individuals. The primary ramification that arises with this is the potential environmental damage that can be caused by the entry of many organizations and individuals into the area of space tourism.

- **The use of nuclear weapons in space**. Though this is mentioned in many treaties, there is no clear resistance to a nation using outer space for destructive purposes. Further, many schools of thought in international law are convinced that the primary issue with international law is the lack of a proper form of punishment for a nation that breaches any law it is aligned to. The possibility of militarization in outer space may be seen to be advantageous to nations, especially when we consider the advancements made in weapons of mass destruction ever since the Second World War ended.

- **Asteroid mining**. Asteroids are made up of some of the rarest metals we find on earth. These include gold, silver, platinum and many other valuable metals. Many nations

have started planning asteroid mining which could have very significant consequences on a global economic level. In fact, certain spacecraft have already been able to collect samples of asteroids in order to send them back to earth. If a nation manages to mine a certain valuable metal on an asteroid, it could cause instability in the global economic situation.

- **Confidentiality**. There is no doubt that some of the breakthroughs we've made through the use of outer space has been used to benefit every nation. For example, the use of weather forecasting and GPS. However, with many nations adopting an "every man for himself" strategy, this can slow down the evolution of scientific breakthroughs.

- **Space Debris**. As mentioned earlier, the use of satellites has led to an immense increase of space debris. At the speeds at which debris orbits the earth, it can cause major damage to satellites.

- **Private Exploration**. Many companies such as SpaceX and Blue Origin have entered the playing field of outer space. The treaties, however, were conceived at a time when only nations had the financial power and technology to launch spacecraft. Very little regulation exists on private companies using outer space. This may strongly influence the environmental as well as the political, social and economic outlook on earth.

It can be argued that the regulations on the use of outer space are quite detailed but it's the unenforceability of international law that prevents any regulation from being effective. This is true to an extent. Few countries have passed national legislation on topics related to outer space. Much more is needed which will vary depending on a country's space launching capability and resources. However, a universal set of definitions must exist for all countries to adopt. This involves the definitions of the terms **outer space** (a major question of where exactly does the atmosphere end and space start arises), **astronaut** and **spacecraft** to name a few. The lack of these, along with the above issues lead to possible ethical and moral conundrums.

CONCLUSION

The future of space exploration has never looked more promising. We're now launching dozens of spacecraft to other planets and their moons. Over the next few decades, we plan on revisiting the Moon and constructing a permanent base which will in turn, be the first major step taken

to ultimately send a manned mission to Mars. Humans are now at a point where science fiction can be brought to reality. We must, however, tread carefully. We are also at a point where the power of science and technology can easily be misused and exploited. For fields such as space exploration, national laws may not be enough. A true set of international laws regarding space travel must be created, based on the treaties that have been created which all countries must follow and respect in order to allow mankind to go further than before.