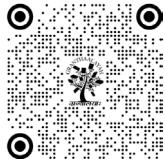


## A CRITICAL STUDY OF JURISDICTION IN OUTER SPACE

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### DOI

[10.29121/shodhkosh.v5.i6.2024.258](https://doi.org/10.29121/shodhkosh.v5.i6.2024.258)

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**Funding:** This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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### ABSTRACT

It has become necessary to reevaluate the jurisdictional difficulties that are present in outer space as a result of the advent of commercial space exploration. The fundamental treaties, such as the Outer Space Treaty (OST), were primarily designed with state actors in mind. As a result, there are considerable gaps in the treaties when it comes to private individuals and companies. This article investigates the changing picture of jurisdiction in outer space, with a particular emphasis on the legal issues that are provided by activities that take place in private space, the legal frameworks that are now in place, and the various pathways that could be taken to overcome jurisdictional ambiguity.

**Keywords:** Jurisdiction, Outer Space Treaty, Criminal Jurisdiction, International Law

## 1. INTRODUCTION

In the midst of the space race that commenced in the 1950s, legal scholars initiated the process of formulating regulations to govern operations conducted in outer space. The United Nations established the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), which formulated the Outer Space Treaty (OST). This convention, in addition to four other comprehensive accords on space, laid forth principles for the conduct of states in outer space. Nevertheless, these accords predominantly neglected the various potential interactions that could occur among humans in space. As a result of the absence of explicit regulations in the Outer Space Treaty concerning the application of state authority in outer space, there exist areas of jurisdiction that are unclear and open to interpretation. The state parties reached a consensus that space would be considered the "common domain of humanity," establishing an international area that is not subject to any specific nation's control. Initially, this was not a major issue as the exorbitant expenses associated with space exploration made it a concern that could be addressed by government funding (Blunt, 2007).

Space exploration has undergone significant transformations in recent years. The private sector has gained greater influence in the exploration and utilisation of space. This transition will result in the emergence of new sorts of

relationships between individuals in space, who may not necessarily be state representatives (Blunt, 2007). These ties were not anticipated by the existing treaty frameworks. One legal expert raised the question: "Given human nature, which criminal laws will govern and judge human behaviour in space?" This question should also encompass civil law matters. Currently, there are areas where persons may soon encounter jurisdictional gaps. During the First Colloquium on the Law of Outer Space, Andrew G. Haley emphasised the importance of establishing legal frameworks before humans venture into space. The initial regulations governing space exploration were sufficient for government operations in space, but, it is now imperative to formulate new legislation to accommodate the growing commercial sector. The difficulty of this endeavour stems from the absence of a recent space treaty subsequent to the Moon Agreement, which was enacted in 1984 and has not received widespread ratification (Blunt, 2007).

Considering that jurisdiction is derived from the principles of territoriality, sovereign equality, and non-interference in the internal affairs of states, countries will have to create novel legal frameworks to exercise authority over individuals in outer space. This study will analyse the existing national and international legal systems that apply to outer space. The essay will initially discuss the frameworks of international customary law and treaty law that govern jurisdiction in space. Subsequently, it will ascertain the deficiencies that remain unaddressed by these global frameworks (Oduntan 2002). After conducting this research, the study will investigate how states have utilised national legislation to address these gaps in authority. This research will demonstrate that governments have only established a fragmented system of authority that will prove to be inefficient in light of the expected surge in space activities. Ultimately, the article will introduce the notion of a space visa as a means to establish a globally consistent jurisdictional framework. The space visa would classify spaceports as frontier areas, akin to contemporary airports. A space visa is a legal authorization granted by a state that allows individuals to leave its territory and enter space. In exchange for this permission, the space traveller agrees to be subject to the personal jurisdiction and laws of that state. This approach would guarantee that every human in space is consistently under the jurisdiction of at least one state, allowing governments to more effectively carry out their responsibility of overseeing non-governmental groups in space (Murray, 2006).

## 2. NEED FOR ASCERTAINING JURISDICTION FOR SPACE

Space tourism is a recent advancement in the field of outer space exploration. Dennis Tito achieved a historic milestone on April 30, 2001, by becoming the inaugural space tourist. He visited the International Space Station (ISS) as an invited guest of the Russian Government. Although Tito's mission was groundbreaking, it is improbable that it will serve as the blueprint for future space tourism. Tito was closely monitored by the government as he was a guest of a government agency. Space tourism in the future is anticipated to bear a closer resemblance to the tourism business on Earth, as private companies will play a key role in enabling space travel. An example of this strategy can be seen in ventures such as Virgin Galactic, which scheduled its inaugural space tourist journey for 2008. With a current count of over 100 individuals who have registered at a price of \$200,000 per ticket, there exists a possibility for financial gain in this entrepreneurial endeavour. Steve Attenborough, the head of astronaut relations at Virgin, suggests that demonstrating the commercial viability of space tourism might attract significant private sector investment, so expediting the growth of the industry. Virgin Galactic is just one of many participants in the field of commercial personal space flight. The Personal Spaceflight Federation's website provides a list of at least 15 companies that are actively involved in this industry, which suggests a rising level of interest in this area (Blunt, 2002).

If Attenborough's prediction is accurate and Virgin successfully builds a viable business model, space tourism has the potential to greatly enhance the space industry, similar to the increase in public backing during the space race of the 1960s. Nevertheless, it may potentially pose significant obstacles to the current legal structure in outer space. The current treaties governing the conduct of state actors in space may not be sufficient to manage interactions between private individuals in space. Space tourists, who differ from the state actors typically dispatched to space as "envoys of mankind," and are not bound by the regulations imposed on private sector personnel, may provide distinctive legal complexities. Their relationships would resemble those of typical Earth residents, characterised by frequent disagreements and crimes (Blunt, 2002).

The growing enthusiasm for lunar research and the possibility of commercially utilising the moon's resources highlight the necessity for more defined jurisdictional regulations. Countries such as the United States, Great Britain, China, and Japan have demonstrated a growing inclination towards lunar exploration. The moon's economic potential has the

capacity to provide substantial business prospects. The ambitions of these nations are primarily motivated by industrial competitiveness and the aspiration to guarantee future rights to resources in outer space. China's space strategy is focused on promoting economic development and accelerating modernization. The same logic that is applied to space tourism can also be applied in this context: if the commercial viability of utilising lunar resources is established, the private sector is expected to make significant investments, resulting in heightened contacts among private individuals on the moon. Although the companies they are employed by are subject to regulation under national legislation, individuals may encounter ambiguity over the specific rules and jurisdiction that apply to them (Blunt, 2002).

### 3. HISTORICAL CONTEXT

#### EARLY SPACE EXPLORATION AND INITIAL LEGAL FRAMEWORKS

The commencement of space exploration in the mid-20th century, characterised by the launch of Sputnik 1 in 1957, led to the establishment of legal frameworks by the international community to regulate activities in outer space. The initial deliberations were around guaranteeing the peaceful and advantageous nature of space exploration for the entire human race, resulting in the development of the fundamental principles of space law (Beischl, 2018).

##### Evolution of the Outer Space Treaty

The Outer Space Treaty (OST) of 1967 serves as the fundamental basis of international space law. The text identifies space as the domain that belongs to all of humanity and outlines concepts such as the prohibition of countries claiming ownership of space, the utilisation of space for peaceful intentions, and the accountability of nations for their space-related actions, regardless of whether they are carried out by governmental or non-governmental organisations. However, the OST was created during a period when space activities were mainly controlled by governments, resulting in considerable omissions regarding private entities (Beischl, 2018).

##### SUPPLEMENTARY AGREEMENTS

The Rescue Agreement (1968), Liability Convention (1972), and Registration Convention (1976) are additional treaties that support the Outer Space Treaty (OST). However, these accords do not fully resolve the jurisdictional challenges related to private entities. These treaties largely prioritise state obligations and legal responsibilities, resulting in a lack of regulation for private space activity (Beischl, 2018).

### 4. THE SHIFT TO PRIVATE SPACE EXPLORATION

The space business has experienced a notable transformation with the rise of private enterprises like SpaceX, Blue Origin, and Virgin Galactic. These firms are enhancing their capacities for commercial space travel, satellite deployment, and space tourism, among various other endeavours. This transition prompts inquiries regarding the utilisation of current legal frameworks for private companies and the jurisdictional obstacles that emerge from their activities. The involvement of private entities has not only broadened the range of space operations but also made the legal situation more complex, necessitating a reassessment of jurisdictional norms and principles (Milanov, 2023).

### THE PARTICIPATION OF PRIVATE ENTITIES IN SPACE ENDEAVOURS POSES NUMEROUS JURISDICTIONAL COMPLEXITIES:

**1. CRIMINAL JURISDICTION:** Establishing the state with the legal power to pursue offences committed in outer space by private individuals. This entails comprehending the scope of extraterritorial jurisdiction and the enforcement of national laws on activities conducted in outer space.

**2. CIVIL JURISDICTION:** Resolving conflicts between private entities and persons in outer space. This involves ascertaining the applicable legal frameworks for contracts, torts, and other civil issues.

**3. REGULATORY JURISDICTION:** The process of creating rules and regulations for private space activities, which includes setting standards for safety, protecting the environment, and defining property rights. This also entails assuring adherence to both domestic and global legislation.

### 5. CRIMINAL JURISDICTION IN OUTER SPACE

The issue of criminal jurisdiction can be intricate: while a crime may be evidently committed, the absence of a prosecuting authority can result in the absence of punishment. In addition, due to the principle of *nullum crimen sine lege* and the ban of *ex post facto* laws, acts that are clearly wrong can go unpunished if there is no specific law prohibiting

them. The five recognised basis for criminal jurisdiction under customary international law are territorial jurisdiction, nationality jurisdiction, protective jurisdiction, passive personality jurisdiction, and universal jurisdiction. In order for a state to pursue legal action, it is necessary for the jurisdiction to be established as a recognised component of that state's domestic legislation (Sundahl, 2009).

## CUSTOMARY INTERNATIONAL LAW

The concept of territorial jurisdiction is the initial and frequently mentioned premise, as the basic role of a state is to preserve order inside its own area. This jurisdiction is applicable when criminal behaviour happens either partially or entirely inside the geographical boundaries of the state. It specifically considers whether any essential aspect of the offence occurred within that jurisdiction. The governing principle is the *lex loci*, which stipulates that an individual can be found guilty of criminal behaviour in a foreign jurisdiction, even if the same behaviour is not considered illegal in their country of origin. Several states have expanded this principle to encompass offences committed in foreign countries that have consequences within their own territory. This extension has enabled states to apprehend criminals beyond their territorial boundaries, but it has faced criticism for potentially promoting the concept of universal jurisdiction. According to Michael Akehurst's influential article on jurisdiction in international law, he asserts that only the nation in which the major impact is experienced has the right to assert jurisdiction. Nevertheless, he fails to offer a definitive criterion for ascertaining the principal outcome, which may result in jurisdictional disputes (Meifa-Kaiser, 2006).

Nationality serves as the second foundation for criminal jurisdiction, granting a state the authority to prosecute crimes committed by its citizens in other territories. States differ in their restrictions on this form of jurisdiction, with some mandating that the act must be criminal under the *lex loci*, limiting jurisdiction to grave offences, or prosecuting only upon the request of the victim or their government. This jurisdiction is limited to the accused individual who is a citizen of the country and does not extend to their international associates (Meifa-Kaiser, 2006).

Furthermore, nations have the option to exercise jurisdiction over actions carried out by foreign individuals in other countries that pose a threat to the state, using the protective principle. To ensure that states do not impose their beliefs on immigrants residing in other countries, it is necessary to place restrictions on this principle. Akehurst proposes implementing a primary effect test, which mandates that the activities of the accused must pose a direct threat to the state as their main consequence. This examination centres on the accused's intention and is specifically pertinent to worldwide terrorism, wherein nations want to expand their jurisdiction over terrorist groups operating beyond their boundaries (Meifa-Kaiser, 2006).

Following is the notion of universality, derived from the ancient decree that any nation has the authority to prosecute pirates. Universal jurisdiction is invoked exclusively on the basis of the inherent nature of the crime, with piracy being the initial offence to which it was applied. Due to its foundation in non-sovereign territory, namely the sea, piracy cannot be effectively combated by the protection of domestic territory by a sovereign state. The concept of universality was employed in addressing piracy as states recognised the necessity for collective action to combat its detrimental impact on all nations. Subsequently, it found application in the 1949 Geneva Conventions pertaining to war crimes and the 1984 Convention Against Torture, so reflecting the notion that certain offences are of such magnitude that concerted efforts from the entire society are necessary to thwart them. Nevertheless, universal jurisdiction is a subject of controversy due to the ambiguity surrounding the classification of offences that come within its scope. Although it is specifically outlined in certain treaties, it is typically used to offences that are considered *jus cogens*. While it is true that the situation could be challenging, with every person potentially being subject to the rules of every state at any given time, this problem can be alleviated if there is consistency in laws across different countries. *Jus cogens* offences, which are universally banned as violations of international law, conform to this model. Certain universally recognised crimes under *jus cogens*, such as piracy or torture, have the potential to be carried out in outer space. Moreover, the principles stated in the Outer Space Treaty (OST) regarding the peaceful use of outer space may be regarded as customary international law, and breaching this concept could be deemed a *jus cogens* violation (Blount, 2007).

Passive personality is the most contentious innovation in international law jurisdictional frameworks. This principle grants a state the authority to exert control over any action carried out by a foreign individual outside its borders, if that action significantly impacts its own inhabitants. Passive personality, as contrast to the protective principle, is applicable to crimes committed outside a state's borders against its own citizens. This concept demonstrates the state's concern for

safeguarding its nationals in foreign countries and its lack of confidence in the foreign territorial state's authority to enforce laws. Typically, states restrict this principle by imposing the requirement of double criminality, which means that the act must be considered a crime in both the state where it occurred and the state claiming jurisdiction. This criterion, which is also found in extradition legislation, essentially restricts jurisdiction when the accused is in another country. Despite facing opposition from countries such as the United States and the United Kingdom, the concept of passive personality has garnered increased recognition, particularly in cases involving terrorism-related offences (Blount, 2007).

## **TREATIES USED TO ESTABLISH AUTHORITY**

Treaties can be utilised by states to assign criminal jurisdiction, which is especially significant in the context of space law. There are four important treaties that are related to space: the Outer Space Treaty (OST), the Registration Convention, the Moon Agreement, and the International Space Station (ISS) Agreement. Furthermore, the establishment of the International Criminal Court (ICC) through the Rome Statute may have implications for criminal jurisdiction in outer space (Milanov, 2023).

### **THE OUTER SPACE TREATY (OST)**

The Outer Space pact (OST), the initial United Nations pact during the early stages of space research, establishes space as the "common heritage of humanity" and forbids any form of national ownership through claims of sovereignty, use, or occupancy. This designates space as being beyond the authority of any one country, while nevertheless permitting nations to assert their control over individuals, organisations, and things in space. More precisely, it confirms that a state has legal authority over objects that are sent into space and the people involved with those objects. Nevertheless, the OST does not provide detailed information on jurisdiction beyond these limits, other for acknowledging that international law applies to space activities. The convention stipulates that nations have the authority to exercise legal control over humans in space. However, the specific level of control required over privately-owned national space objects is still uncertain (Milanov, 2023).

### **REGISTRATION CONVENTION**

States are obligated by the Registration Convention to register the space objects they send into space. The registry exerts jurisdiction over the space object, expanding the Outer Space Treaty (OST) by enabling governments to assign jurisdiction through agreements amongst the states that launch the object.

### **THE MOON AGREEMENT**

The Moon Agreement, the final treaty of the five general space treaties ratified by the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), contributes less to the jurisdictional system because of its limited participation by states. The Outer Space Treaty (OST) explicitly states that the moon and other celestial bodies are to be used exclusively for peaceful activities, hence forbidding the establishment of military installations and private ownership of any buildings on the moon (Tronchetti, 2009).

### **INTERNATIONAL SPACE STATION AGREEMENT**

The ISS Agreement holds great significance as it stands as the sole authoritative framework for criminal law in outer space at now. This statement refers to a treaty known as the Registration Convention, in which participating countries assign specific legal authority to each other. This agreement pertains to the International Space Station (ISS) and is established by Canada, the European Space Agency, Japan, the Russian Federation, and the United States. It follows a nationality-based approach to criminal jurisdiction, which means that each state has the authority to prosecute their own citizens. Passive personality jurisdiction is a component of this, which permits governments to exercise jurisdiction if a crime impacts their citizens or causes harm to their aviation assets. If the accused state declines jurisdiction, the aggrieved state has the right to assert it. This illicit governing system is exclusively enforced on the International Space Station (ISS) and its inhabitants, but the term "inhabitants" lacks explicit definition (Tennen, 2003).

### **THE ROME STATUTE AND THE INTERNATIONAL CRIMINAL COURT (ICC) ARE CLOSELY RELATED.**

The ICC was formed by the Rome Statute to exercise jurisdiction over specific crimes. Nevertheless, the inherent characteristics of these offences, namely genocide, crimes against humanity, war crimes, and the crime of aggression, render it improbable that they would occur in outer space. Currently, the scale needed for genocide and crimes against humanity cannot be achieved in space. In order for war crimes and crimes of aggression to take place, there would have to be a breakdown of the current framework of space law, as the Outer Space Treaty requires that space be utilised exclusively for peaceful activities. The International Criminal Court (ICC) acquires jurisdiction if the actions of the accused take place within the territory of a state that is a party to the ICC or if the accused is a citizen of a state that is a party to the ICC. If such criminal acts were to occur in outer space, governments may choose to report them to the International Criminal Court (ICC) due to the financial burden associated with conducting the inquiry. Although the Rome Statute is applicable, its current relevance to space is little, but it has the potential to become significant in the future (Smith, 2020).

## ADDITIONAL FACETS OF JURISDICTION

Implementation Determining jurisdiction is a crucial factor in establishing the application of legal principles in outer space. Although there may be a possibility of multiple entities venturing into outer space in the future, it is expected that only a limited number of states would initially own comprehensive space programmes. This circumstance has two noteworthy consequences. Initially, the governments that possess the requisite resources will bear the task of law enforcement. Furthermore, this could result in the discriminatory application of laws in outer space, giving preferential treatment to the nation responsible for enforcement (Gorove, 1995).

An additional concern arises when a government, in its capacity of law enforcement in space, attempts to establish jurisdiction over crimes merely based on its enforcement of the law. According to existing international law, there is a requirement for a legitimate connection to exist between the state and the individuals, assets, or occurrences for whom jurisdiction is being asserted. There are two issues that arise from this. Asserting a novel jurisdictional framework gives rise to a situation where the principle of "might makes right" prevails, allowing only those with significant might to assert criminal jurisdiction in outer space. Alternatively, if a state attempts to include this inside current jurisdictional frameworks, it may seem as though it is making a territorial claim in space. This has the potential to establish a legal precedent where a country's domestic laws are deemed applicable to all individuals in space, so expanding its authority in contravention of the Outer Space Treaty (OST) (Blount, 2007).

This study does not extensively explore the advantages and disadvantages of establishing an international police organisation for outer space. An enforcement body capable of addressing the challenges faced in space exploration is expected to take several decades to establish. However, this does not provide immediate assistance in dealing with the present requirements of space exploration, since unjust actions may take place without the presence of a dedicated enforcement organisation (Blount, 2007).

This paper primarily focuses on judicial jurisdiction, but it also addresses the issue of legislative jurisdiction, which is closely related. Under the limitations imposed by the Outer Space Treaty (OST), states are prohibited from expanding their authority over outer space, including legislative jurisdiction. Legislative jurisdiction pertains to the power of state organs to enact enforceable laws inside their territory. Nevertheless, states have the authority to expand their legislative jurisdiction to include their citizens who are residing in foreign countries. For example, a state could enact legislation prohibiting its inhabitants from masticating gum when in outer space. States must refrain from misusing this privilege to enact legislation that encroaches upon the sovereignty and autonomy of another state (Blount, 2007).

Difficulties emerge when a state tries to expand its legislation to cover outsiders. It is ambiguous if a state that exercises passive personality breaches the Outer Space Treaty (OST) if it enacts legislation criminalising assaults on its residents in space. Crimes are often regulated based on geographical boundaries, therefore, this rule might be interpreted as expanding a state's authority into outer space. This legislative matter gives rise to a situation where certain actions may be considered criminal on Earth, but not in space, if a state has not adequately expanded its criminal laws. This supports the case for establishing an international space code, which, similar to an international regulatory organisation, will require a significant amount of time to construct and is improbable in the foreseeable future (Blount, 2007).

## REGULATORY JURISDICTION AND COMPLIANCE

Efforts made by both national and international regulatory bodies

Effective oversight of private space activity necessitates the careful consideration of both domestic concerns and global responsibilities. States have the responsibility to grant permission and oversee the space activities of their citizens, making sure they follow international agreements and domestic laws. As an illustration, the Federal Aviation Administration (FAA) of the United States is responsible for supervising the authorization of commercial space launches, guaranteeing that they adhere to safety and environmental regulations (Milanov, 2023).

## THE IMPACT OF ENVIRONMENTAL REGULATIONS ON THE ISSUE OF SPACE DEBRIS

Space debris presents a substantial hazard to both now and future space activities. The Inter-Agency Space Debris Coordination Committee (IADC) has created international standards that offer advice for reducing space debris. Nevertheless, the implementation of these rules depends on the regulatory frameworks established by each country. Efficient control of space debris necessitates the collaboration of nations and the establishment of enforceable global regulations (Milanov, 2023).

## OWNERSHIP RIGHTS AND THE EFFICIENT USE OF RESOURCES

The question of establishing clear property rights in space, specifically for resources obtained from celestial planets, is still unsolved. The OST explicitly forbids national appropriation, but it does not specifically discuss the ownership of resources extracted by private businesses. The U.S. Commercial Space Launch Competitiveness Act and similar national legislation aim to fill this void by acknowledging the ownership of extracted commodities as private property. Nonetheless, it is imperative to establish a comprehensive global framework to prevent disputes and provide equitable access to space resources (Milanov, 2023).

## 6. INTERNATIONAL COOPERATION AND GOVERNANCE

### THE ROLE OF INTERNATIONAL ORGANISATIONS

International organisations, such as UNCOPUOS, are vital in promoting collaboration and establishing legal structures for space endeavours. UNCOPUOS serves as a forum for states to engage in discussions and negotiations regarding matters pertaining to space, with the aim of fostering the nonviolent utilisation of outer space. The International Telecommunication Union (ITU) has a crucial responsibility in overseeing the allocation of orbital slots and frequencies, guaranteeing the absence of interference among space operations (Beischl, 2018).

### PROPOSALS FOR NOVEL TREATIES AND AGREEMENTS

In order to tackle the jurisdictional complexities presented by private space endeavours, the global community may contemplate the creation of novel treaties or the modification of current ones. Suggestions encompass the implementation of a thorough space traffic management system and the formation of a global organisation to supervise the utilisation of space resources. These projects necessitate a widespread agreement among nations and the involvement of both governmental and non-governmental entities (Beischl, 2018).

## ILLUSTRATIONS OF EFFECTIVE GLOBAL COLLABORATION

Notable instances of effective global collaboration in space include the International Space Station (ISS), which is a joint endeavour involving numerous nations. The International Space Station (ISS) functions within a system of intergovernmental agreements that specifically deal with matters of jurisdiction and guarantee the harmonised functioning of the station. Another instance is the Artemis Accords, which seek to define fundamental guidelines for the investigation and exploitation of the Moon and other celestial entities (Beischl, 2018).

## 7. NATIONAL LEGISLATION AND POLICIES

### EXAMINATION OF SPACE LEGISLATION IN MAJOR NATIONS

An examination of national space laws shows a variety of approaches to governing private space activity. For instance, the United States has implemented extensive laws that address several facets of space operations, such as licencing, liability, and property rights. Luxembourg, as with other nations, has enacted legislation to entice commercial space

enterprises. These country laws demonstrate varying objectives and regulatory philosophies, emphasising the necessity for harmonisation and international cooperation (Oduntan, 2002).

An analysis of different methods used by countries

An analysis of the space legislation in many countries highlights both similarities and differences. For instance, whereas numerous countries mandate the licencing and supervision of space operations, the precise criteria and processes differ significantly. Certain nations prioritise the advancement of commercial space endeavours, whereas others place greater importance on ensuring safety and protecting the environment. Gaining a comprehensive understanding of these distinctions can aid in the identification of optimal methods and opportunities for global cooperation (Oduntan, 2002).

## PROPOSED APPROACHES FOR DETERMINING JURISDICTION IN SPACE BY SCHOLARS

In his article "Astronauts and a Unique Jurisprudence: A Treaty for Spacekind," George Robinson contends that there is a compelling need for a dedicated treaty to address legal matters concerning humans in space. He references studies that suggest the space environment can cause various physiological responses in humans due to its biological impact on the body. In order to address this problem, Robinson suggests implementing a treaty that would enable individuals residing in space to create regulations specifically designed for their distinct situations. He argues that such a treaty might address the medical effects of space and incorporate the cultural variety of astronauts. The concept suggests granting authority to an expert academy within the UN to establish rules exclusively for Spacekind, separate from the laws that control Earth. Robinson emphasises that the development of laws on Earth has been influenced by the evolution of human biology, highlighting the importance of creating legislation for space in the future. However, he concedes that his proposed treaty does not immediately tackle the urgent issues of space flight. The author recognises that the establishment of true space civilizations is still far away. They propose that the early exploration of space will probably involve extending existing terrestrial rules into space, rather than requiring the creation of a whole new regulatory framework (Robinson, 1984).

Karen Robbins supports the Special Maritime Jurisdiction Act of the United States by proposing a minimum contacts approach to criminal jurisdiction in space, similar to its use in US civil law. She argues that the existing laws on extraterritorial jurisdiction are insufficient and suggests that courts adopt a minimum contacts test to establish jurisdiction, taking into account the accused's relationship with a country and its interests in the case. Robbins recognises the possible shortcomings of using this test in criminal law, specifically its capacity to expose individuals to unforeseen legislation or to generate diplomatic tension between governments asserting authority. Although it may be efficacious in civil law, she contends that it could give rise to ambiguity and diplomatic complexities in criminal proceedings (Robbins, 1983).

Wilfred Jenks suggests that acts of violence in space should be regarded as acts of piracy and be subject to universal jurisdiction. He contends that whereas piracy has historically been associated with maritime settings, it might logically encompass other extraterritorial realms such as air and space. Jenks recognises the difficulty of determining the exact definition of a "violent act" in outer space, which makes it more complicated to apply universal jurisdiction. The plan seeks to anticipate potential instances of piracy in outer space, but it does not clearly define the specific behaviours that would be considered piracy. This lack of clarification creates challenges in the fields of criminal law and international relations (Jenks, 1965).

A space visa is proposed as a solution to the legal ambiguities that arise in outer space. The idea recommends the establishment of a standardised global framework to address the fragmented nature of jurisdictional matters. This visa would operate in a manner analogous to visas issued for land-based territories, enabling nations to exercise legal authority over individuals in outer space based on their national laws. The objective is to offer a clear and definite legal framework for private sector investors and space tourists, while also guaranteeing adherence to international commitments outlined in treaties such as the Outer Space Treaty (OST). The space visa would necessitate individuals to comply with the laws of the issuing state during their space journey, thereby avoiding jurisdictional gaps and facilitating efficient supervision of non-governmental operations in space. The proposal highlights the importance of establishing well-defined jurisdictional regulations in response to the increasing involvement of commercial entities in space exploration. It advocates for a flexible framework that can accommodate future advancements in space law (Blount, 2007).

## 8. FUTURE OUTLOOK AND CHALLENGES

### THE IMPACT OF TECHNOLOGICAL ADVANCEMENTS

The space sector is being revolutionised by technological developments like as reusable rockets, in-orbit service, and space mining. These advancements present fresh prospects but also bring forward novel obstacles for jurisdiction and regulation. It is essential to ensure that legal frameworks adapt to technological advancements in order to maintain order and safety in space.

### LONG-TERM CHALLENGES REGARDING JURISDICTION IN SPACE

Key long-term concerns for jurisdiction in space encompass the effective management of space transportation, the mitigation of space debris, and the resolution of environmental consequences arising from space activities. With the increasing congestion in space, there is a higher likelihood of collisions and other events. This calls for more cooperation and regulation to address the situation. Furthermore, the investigation and exploitation of celestial bodies give rise to intricate inquiries regarding ownership rights, safeguarding the environment, and the administration of resources.

## 9. CONCLUSION

The swift development of space activities, propelled by the growing participation of private companies, requires a reassessment of jurisdictional matters in outer space. Although the current legal frameworks serve as a basis, there are still important deficiencies that need to be resolved in order to guarantee the organised and legitimate execution of space operations. This article has examined the main legal obstacles and suggested possible remedies, highlighting the importance of global collaboration, thorough regulation, and self-regulation by the industry. In order to effectively deal with the intricate and changing issues of jurisdiction in outer space, it is crucial for humanity to establish a strong and comprehensive legal system as we continue to explore and make use of space.

### CONFLICT OF INTERESTS

None.

### ACKNOWLEDGMENTS

None.

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