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# An Overview of Copyright Protection in Space Activities

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Abstract
The rapid growth of space activities, including satellite communications, Earth observation, space tourism, and scientific exploration, has raised major legal questions regarding intellectual property (IP) protection, particularly copyright. This article provides an overview of copyright protection in the context of space activities, examining the existing legal frameworks, challenges, and future directions. While international treaties such as the Outer Space Treaty of 1967 establish foundational principles for space exploration, they do not explicitly address copyright issues. Similarly, National space laws lack detailed provisions on intellectual property rights in space, creating a legal gray area. Key challenges include jurisdictional complexities due to the lack of territorial sovereignty in outer space, the applicability of copyright law to space-generated data, and the enforcement of copyright infringement claims. Case studies, such as the Apollo moon landing photographs and satellite imagery disputes, illustrate the practical implications of these challenges. The article also explores the role of private entities in shaping copyright policies, the potential for technological solutions, and the ethical considerations of balancing copyright protection with the principle that space is the "province of all mankind." The conclusion emphasizes the need for international cooperation and harmonization of copyright laws to address these unique challenges. As space activities continue to grow, developing a robust legal framework for copyright protection will be essential to fostering innovation while ensuring equitable access to the benefits of space exploration.

Keywords: Copyright, Space Activities, Legal Frameworks, Protection.

## I. INTRODUCTION

The exploration and utilization of outer space have evolved extensively since the launch of Sputnik 1 in 1957 by the then-Union Soviet Socialist Republic (USSR). Space exploration increased largely as a result of the efforts of the Super powers, namely United States and Soviet Union.[1]During the initial phase, most of the space activities were undertaken by the State. Today, space activities cover a wide range of endeavors, including satellite communications, Earth observation, space tourism, and even the potential colonization of other planets with the entry of private entities to space activities. As these activities become more commercialized and varied, the need for robust legal frameworks to protect intellectual property (IP) rights, particularly copyright, has become increasingly important. This article offers an overview of copyright protection in the context of space activities, exploring the legal frameworks, challenges, and future directions.

## II. THE LEGAL FRAMEWORK OF SPACE ACTIVITIES

[1] Kailash Thakur, Outer Space and Military Supremacy, 11 (Deep & Deep Publication, New Delhi, 1985).

Space law is a relatively recent field of legal study. The development in technology of the last hundred and forty years have required the law to respond.[2]The rapid progress in space technology, particularly following the launch of unmanned satellites by the United States and the former Soviet Union, necessitated a legal framework to address the complexities of outer space activities. These developments prompted the United Nations to establish a dedicated committee to explore the peaceful uses of outer space. Over time, the UN adopted a series of treaties and conventions aimed at regulating specific aspects of space exploration and utilization. As a result, space law evolved into a distinct branch of international law, characterized by its global applicability and cooperative nature. The legal framework governing space activities can be broadly categorized into two primary domains: International Space Law and National Space Legislation. International Space Law encompasses the treaties, principles, and guidelines established through multilateral agreements under the auspices of the United Nations, which aim to regulate the conduct of states and other entities in outer space. National Space Legislation, on the other hand, refers to the domestic laws and regulations enacted by individual states to govern their own space activities and ensure compliance with international obligations. Together, these two categories form the foundation of the legal architecture that governs human's exploration and use of outer space.

## III.INTERNATIONAL SPACE LAW

The foundation of space law is laid down by several international treaties and agreements, primarily under the auspices of the United Nations. The most significant of these is the Outer Space Treaty of 1967 (formally 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).[3] This treaty establishes that outer space is the "province of all mankind" and prohibits national appropriation by claims of sovereignty, use, or occupation.

Other key treaties include:

1. The Rescue Agreement of 1968: Obliges states to assist astronauts in distress and return them to their home country.
2. The Liability Convention of 1972: Establishes the liability of launching states for damage caused by their space objects.
3. The Registration Convention of 1975: Requires states to register space objects launched into Earth orbit or beyond.
4. The Moon Agreement of 1979: Extends the principles of the Outer Space Treaty to the Moon and other celestial bodies, emphasizing that they should be used for the benefit of all countries. While these treaties provide a broad legal framework for space activities, they do not specifically address intellectual property rights, including copyright. Further, there are 5 (five) principles adopted by the United Nations with respect to the Outer Space. They are as follows:-

1. Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, 1963.
2. Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, 1982.
3. Principles Relating to Remote Sensing of the Earth from Outer Space, 1986.
4. Principles Relevant to the Use of Nuclear Power Sources in Outer Space, 1992.
5. 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.

## IV.NATIONAL SPACE LEGISLATION

In addition to the framework established by international treaties, numerous states have enacted national space legislation to regulate space activities undertaken by their nationals and entities. These domestic laws typically encompass provisions addressing critical aspects such as licensing requirements, liability regimes, and the registration of space objects. Despite their comprehensive scope in regulating operational and procedural dimensions of space activities, national space laws, much like their international counterparts, often lack detailed provisions pertaining to intellectual property rights in outer space. This gap in the legal framework highlights an area that remains underdeveloped, necessitating further scholarly and policy-oriented attention to address the evolving challenges and opportunities associated with intellectual property in the context of space exploration and utilization.

Copyright Protection in Space Activities

[2] Francis Lyall, Paul B. Larsen, Space Law: A Treatise, 2 (Ashgate Publishing Limited, 2009).

[3]Available at: https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html <Accessed on 4 August, 2023>

Copyright is a legal term describing rights given to creators for their literary and artistic works. It is also another domain of intellectual property that grants the creator of original work exclusive rights to its use and distribution, usually for a limited period of time, with the aim of enabling the creator of intellect works to receive and enjoy compensation for their intellectual effort. Copyright protects a wide range of works, including literary, musical, and artistic works, as well as software, databases, and other forms of creative expression. However, there is no copyright in ideas, schemes, systems, or methods.[4] Key aspects of copyright law include:

1. Originality: The work must be original and exhibit a minimal degree of creativity of the creator.
2. Fixation: The work must be fixed in a tangible medium of expression.
3. Exclusive Rights: The copyright holder has the exclusive right to reproduce, distribute, perform, display, license, assignment, and create derivative works based on the original.
4. Economic Interest: The creators must have the economic interest over his innovative creation.

Applicability of Copyright Law to Space Activities

The application of copyright law to space activities raises several distinctive issues, primarily due to the lack of territorial jurisdiction in outer space. Intellectual Property laws are territorial based which is otherwise means, it is operational within the national boundary of the state although, through treaties, conventions, etc., they may be extended to other states as well. Since space is considered a 'res communis' which simply means commons to all, traditional notions of territoriality and national jurisdiction do not apply as they do on Earth in the same way.

1. Ownership of Copyright in Space: One of the primary questions is who owns the copyright to works created in space. For example, if an astronaut takes a photograph of Earth from the International Space Station (ISS), who holds the copyright to that photograph? The answer depends on several factors, including the nationality of the astronaut, the entity they are employed by, and any agreements in place. In the case of the ISS, the fundamental principle laid down in the Intergovernmental Agreement (IGA) is that the part of the Space Station complex in which the invention was made is deemed to be an extension of the territory of the State that registered that element. The Intergovernmental Agreement (IGA) on Space Station Cooperation governs the legal framework for activities on the station. The IGA stipulates that each partner state retains jurisdiction and control over its own modules and personnel.[5] Therefore, the copyright to works created by an astronaut would likely be extended protection by the national copyright laws of the astronaut's native state.

2. Copyright Infringement in Space: Another issue is the enforcement of copyright laws in space. If a copyrighted work is reproduced or distributed without authorization in space, which legal system would apply? Given the lack of territorial jurisdiction, it is unclear how copyright infringement claims would be adjudicated. One possible approach is to apply the national laws of the country where the infringing act originated or where the infringing party is based. However, this raises questions about the extraterritorial application of national laws and the potential for conflicting legal standards.

3. Copyright Protection for Space-Generated Data: Space activities generate huge amounts of data, including satellite imagery, scientific data, and telemetry data. The question of whether this data is subject to copyright protection is complex. In general, primary data is not considered copyrightable because it lacks the necessary originality. However, if the primary data is processed or presented in an innovative way, it may qualify for copyright protection. For example, a satellite image of Earth may not be copyrightable in its raw form, but if the image is enhanced or annotated in a creative manner, the enhanced version could be protected by copyright.

## V. CHALLENGES IN COPYRIGHT PROTECTION FOR SPACE ACTIVITIES

1. Jurisdictional Issues: As discussed earlier, the lack of territorial jurisdiction in outer space makes difficult the application of copyright law. Traditional copyright laws are based on the principle of territoriality, meaning that they apply within the borders of a specific country. In space, however, there are no borders as stipulated by Article II of the Outer Space Treaty, which laid down the Principle of Non-Appropriation by state, and as such, activities often involve multiple countries and entities. This has raised questions about which country's laws apply to copyright disputes in space and how those laws can be

[4] Elizabeth Verkey, J.S. Isaac, Intellectual Property 21 (Eastern Book Company, 2021).

[5] Refer to International Space Station Intergovernmental Agreement, 1998. Available at: https://www.state.gov/documents/organization/107683.pdf <Accessed on 10 August, 2023>

enforced. For instance, if a satellite operated by a U.S. Company captures an image that is later used without authorization by a European company, which country's copyright laws would govern the dispute?

2. International Cooperation and Harmonization: Given the universal nature of space activities, international cooperation and harmonization of copyright laws are indispensable. However, achieving this is challenging due to differences in national copyright laws and the lack of a unified international legal framework for space activities. Efforts to harmonize copyright laws have been made through international agreements such as the Berne Convention for the Protection of Literary and Artistic Works, the World Intellectual Property Organization (WIPO) Copyright Treaty, the World Trade Organization (WTO) Trade Related Aspect of Intellectual Property Rights (TRIPS) Agreement, etc. However, these agreements do not specifically address the unique challenges of copyright protection in space.

3. Technological Progress: The rapid pace of technological advancements in space activities also poses challenges for copyright protection. For example, the development of autonomous spacecraft and artificial intelligence (AI) systems raises questions about the ownership of works created by these technologies. If an AI system generates a piece of music or a literary work while in space, who holds the copyright to that work? Similarly, the increasing use of 3D printing technology in space could lead to copyright issues. If a 3D printer on the ISS produces a copyrighted object, who is liable for any potential infringement?

## VI. CASE STUDIES

### The Apollo Moon Landing Photographs

One of the most iconic examples of copyright in space is the photographs taken during the Apollo moon landings. These photographs, taken by NASA astronauts, are considered works of the U.S. government and are therefore in the public domain. However, there have been instances where individuals or companies have attempted to claim copyright over these images, leading to legal disputes.[6]

### Satellite Imagery and Google Earth

Satellite imagery is another area where copyright issues arise. Companies like Google use satellite imagery to create maps and other products. While the raw satellite data may not be copyrightable, the way it is processed and presented can be. For example, Google Earth's interface and the way it displays satellite imagery are protected by copyright. However, there have been cases where third parties have used satellite imagery without authorization, leading to copyright infringement claims. In some cases, the courts have ruled that the use of satellite imagery falls under the "fair use" doctrine which is a legal norm in US[7], particularly when it is used for educational or non-commercial purposes.

## VII. FUTURE DIRECTIONS

1. Development of International Guidelines Given the challenges of applying traditional copyright laws to space activities, there is a need for the development of international guidelines or agreements specifically addressing copyright in space are needed. These guidelines could provide clarity on issues such as ownership, jurisdiction, and enforcement, and help harmonize copyright laws across different countries. One potential model is the WIPO Copyright Treaty, which addresses copyright issues in the digital environment. A similar treaty could be developed to address the unique challenges of copyright protection in space.

2. Role of Private Entities

As space activities become increasingly commercialized, private entities will play a key role in shaping the legal framework for copyright protection. Companies involved in space tourism, satellite communications, and other space-related industries will need to develop policies and agreements that address copyright issues. For example, space tourism companies could include copyright clauses in their passenger agreements, specifying who owns the rights to any media created during the trip. Similarly, satellite operators could develop licensing agreements for the use of satellite imagery and data.

3. Technological Solutions

Technological advancements could also play a role in addressing copyright issues in space. For example, blockchain technology could be used to create a decentralized system for registering and tracking copyright ownership of space-generated works. This could help resolve disputes over ownership and provide a transparent record of

[6] Available at: https://www.nasa.gov/history/alsj/a11/images11.html <Accessed on 7 July, 2023>

[7] Available at: https://www.copyright.gov/help/faq/faq-fairuse.html <Accessed on 22 July, 2023>

copyright claims. Similarly, digital rights management (DRM) technologies could be used to protect copyrighted works in space, preventing unauthorized use or distribution. However, the use of DRM in space would need to be carefully balanced with the principles of open access and the sharing of scientific knowledge.

4. Ethical Considerations

There are ethical considerations to take into account when discussing copyright protection in space. The principle that outer space is the "province of all mankind" suggests that space activities should be conducted for the benefit of all countries and peoples. This raises questions about whether copyright protection in space should be more limited than on Earth, to ensure that the benefits of space exploration are shared widely. For example, should scientific data collected in space be subject to copyright protection, or should it be made freely available to the global scientific community? Similarly, should works created in space be considered part of the global cultural heritage, and therefore not subject to the same copyright restrictions as works created on Earth?

## VIII. CONCLUSION

Copyright protection in space activities is a complex and evolving area of law that presents unique challenges due to the lack of territorial jurisdiction, the universal nature of space activities, and the rapid pace of technological advancements. While existing international treaties and national laws provide a broad legal framework for space activities, they do not specifically address copyright issues. As space activities become more commercialized and diverse, there is a need for the development of international guiding principles and agreements that provide clarity on copyright ownership, jurisdiction, and enforcement. Private entities will also play a key role in shaping the legal framework for copyright protection in space, through the development of policies and agreements that address copyright issues. Technological solutions, such as blockchain and DRM, could help address some of the challenges of copyright protection in space, but they must be carefully balanced with the principles of open access and the sharing of scientific knowledge. Finally, ethical considerations must be taken into account to ensure that the benefits of space exploration are shared widely and that space activities are conducted for the benefit of all mankind. In conclusion, copyright protection in space activities is an important and complex issue that requires careful contemplation and international cooperation. As we continue to explore and utilize outer space, we must develop a legal framework that protects intellectual property rights while also promoting the principles of open access and the sharing of knowledge.

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