STM JOURNALS

Research & Reviews: Journal of
Space Science & Technology

https://journals.stmjournals.com/rrjosst

ISSN: 2321-2837 (Online)
ISSN: 2321-6506 (Print)
Volume 13, Issue 3, 2024
September–December
DOI (Journal): 10.37591/RRJoSST

Research RRJoSST

IPR in Outer Space: Issues, Challenges, Legal Framework, and Future Considerations

Kapila Patidar[1], Sakar Joshi[1], Aditya Awasthi[2,*]

Abstract

"Space exploration is a force of nature unto itself that no other force in society can rival"—Neil deGrasse Tyson. Whenever we hear the word outer space, the words that pop up in our mind are sun, star, galaxy, moon, meteoroids, celestials, etc. Intellectual property rights (IPR) are a key concept in the development of a nation. Therefore, to encourage the same in outer space, the foremost challenges of implementing the IPR in outer space must be resolved. The transformation of intellectual property protection in space activities greatly contributes to enhancing sustainable development for economies and society under new scope towards space commercialization. The subject of protecting intellectual property in space has not been specifically addressed in the articles of any international intellectual property treaty, nor have the provisions of the five outer space treaties do so. The lack of clarity around the law might deter governments and non-governmental organizations from actively engaging in commercial space operations. The territorial contradiction between the legal frameworks of intellectual property and outer space is one of the reasons concerned leading to this legal position. This research aims to theoretically explain territorial conflicts between intellectual property and outer space legal systems. To achieve the goal of protecting intellectual property in space, this system uses space objects as a linking element to connect space activities with the current laws of the state of registry. The purpose of the study is to analyze the problems that come with applying IPR in space, potential legal problems, and future considerations of commercializing space and overall economic development.

Keywords: Intellectual property, commercialization, outer space treaty, territoriality, international cooperation

INTRODUCTION

Space is a three-dimensional expanse which is unoccupied. Space is a non-gravity field where all the celestial bodies lie, such as planets, stars, galaxies, black holes, sun and whatnot. Outer space activities deal with sophisticated technology and require out-of-the-box inventiveness; this underlines the importance of intellectual property rights (IPRs) [1] in outer space. Talking about the future of space, one would say that what concerns us most is intellectual property rights, and many treaties deals with it like The Outer Space Treaty 1967, [2]; The Moon Agreement, 1979 [3] and The Intergovernmental Agreements. The statutes provided are ambiguous, and there is nothing clearly mentioned about IPRs in Space.

According to estimates, the space sector will expand by 10% by 2025, reaching a total value of USD 13 million. Why, therefore, does IPR matter so much? These days, private entities can explore and exploit space rather than only government action. These organizations' investments are essential to the development of space operations. But given that they are not protected, why would these organizations invest?

***Author for Correspondence**
Aditya Awasthi
E-mail: aditya.awasthi@avantika.edu.in

[1]Student, Department of Law, Indore Institute of Law, Indore, Madhya Pradesh, India
[2]Assistant Professor, Department of Law, Indore Institute of Law, Indore, Madhya Pradesh, India

Received Date: August 31, 2024
Accepted Date: October 28, 2024
Published Date: November 05, 2024

Citation: Kapila Patidar, Sakar Joshi, Aditya Awasthi. IPR in Outer Space: Issues, Challenges, Legal Framework, and Future Considerations. Research & Reviews: Journal of Space Science & Technology. 2024; 13(3): 21–26p.

Talking about IPR in space is a complex issue as the ambit of IPR laws are just applicable to the territory of land and sometimes air space. The main contentions behind implementing IPR in outer space are sovereignty and jurisdiction. IPR are created to protect the infringement of the owner's intellect within the territorial authority of any state, while on the other hand space is a *res communis* [4].

The importance of IPR in space operations is discussed in the first section. Organizations deal with the World Intellectual Property Rights Organization's (WIPO) and treaties' legal frameworks for intellectual property rights. The final section discusses the difficulties of putting intellectual property regulations into practice in space. The potential of IPR for the advancement of commercial space operations is demonstrated in the fourth section.

Another factor contributing to the increased awareness of intellectual property rights in space protection is the globalization of space operations. More space operations are being conducted because of international cooperation programmes. As a result, the need for a straightforward, consistent, and trustworthy international framework is urgent. Even if national laws pertaining to intellectual property are generally harmonized, several national laws continue to employ disparate principles. Therefore, to safeguard intellectual property rights in space operations, a unified legal framework is needed. Space technology is developing, which is leading to new inventions and commercial opportunities [5]. For example, the idea of space tourism is growing and evolving with the aid of modern space technologies. Both patents for inventions developed in outer space and copyrights relating to databases owned through the conduct of activities in interplanetary environments will need new systems. The reality of space tourism will open up the protection of trademarks and industrial design in space, which may become even more important.

RESEARCH METHODOLOGY

For research and evaluation, the researchers used secondary data. Secondary data is obtained from a variety of previously published scholarly works, blogs on the internet, Google Scholar, commission reports, publications, and firsthand observation. The current study report largely relies on secondary data because original research on this topic is very specialized.

RESEARCH QUESTIONS

1. Whether the sovereignty of space has been defined and who can claim sovereignty over space?
2. What is the territoriality of space?
3. Is there any provision WIPO which talks about IPR in outer space?

LITERATURE REVIEW

Isabelle Bouvet's [6] research paper "Certain Aspects of Intellectual Property Rights in Outer Space" outlines patent law while explaining the topic of intellectual property rights in space. The study delves into the clauses concerning intellectual property and the interchange of commodities and data included in the Intergovernmental Agreement on the International Space Station.

Sajal Sharma and Shashank Pathak [7] explain that national laws protecting intellectual property are confined to national borders and do not transcend them. This means that intellectual property rights, including patents, are subject to a rigorous territorial approach. They point out that the 1967 Outer Space Treaty, which states that space is not subject to national appropriation and should be used for the benefit and advantage of all countries, makes the notion of territorial sovereignty difficult when it comes to space operations. The authors point out the difficulty in reconciling the approaches of terrestrial intellectual property law and outer space law.

According to K.D. Raju's [8] study, the framework in place is insufficient to handle innovations created in space, and the current apparatus should be modified appropriately to accommodate these creations. The report also states that additional factors not included in this analysis include criminal, civil, and tortious liability.

LEGAL FRAMEWORK FOR IMPLEMENTING IPR IN OUTER SPACE

International Conventions Relating to Intellectual Property and Outer Space

The Paris Convention for the Protection of Industrial Property is one of the most important international treaties in the field of industrial property; it does not expressly consider the question of inventions in outer space [6, 9, 10]. However, it mainly contains provisions establishing the national treatment principle (Article 2 [11] the right of priority (Article 4 [11]) and common rules, including certain measures for the enforcement of Intellectual property rights, which all the Member States must follow.

It refers to the independence of patents obtained for an identical innovation in diverse nations, as a result community Member States are allowed to award different patents independently. This shall mean that a patent for an invention may not be refused, revoked or terminated in one of the Member States on this ground being applied because in respect to this same invention filed previously by another applicant are standing the reasons above. This has the consequence that a patent granted to an invention in one country does not mean other countries are willing or obliged to give it – this is after all, what they are fighting about. A rule on a similar line with respect to registered marks is provided under Article 6 where the special mention must be made of particular interest regarding outer space activities, this is again through its Article 5 which states that there will not be infringement in the case of rights conferred by patent [11].

- The utilization of patent-protected equipment, including machinery, tackle, gear, and other accessories, on board foreign vessels that may inadvertently or temporarily enter the territorial waters of another nation, if the equipment is being used solely for the vessel's purposes.
- The application of patent-protected devices in the design, manufacture, or operation of aeroplanes, land vehicles, or their accessories in other Paris Union member countries when those objects unintentionally or temporarily enter those nations.

Berne Convention for the Protection of Literary and Artistic Works

One of the important agreements in copyright and associated rights is the Berne Convention for the Protection of Literary and Artistic Works (henceforth referred to as the "Berne Convention"). The Berne Convention, like the Paris Convention, does not specifically address the subject of intellectual property rights in space. Nonetheless, it includes clauses outlining fundamental ideas like automatic protection—that is, copyright protection should not be subject to formalities—national treatment, and the "independence" of protection [12].

WIPO Copyright Treaty (WCT)

The WCT provides, among other things, for the protection of "(i) computer programs, whatever may be the mode or form of their expression, and (ii) the compilation of data or other material ("databases") in any form, which by reason of the selection or arrangement of their contents constitute intellectual creations [13]. In particular, Article 8 [11] assures the authors' right to enjoy the exclusive right of authorizing any communication to the public of their works, including the making available to the public of their works in such a way that members of the public may access these works from a place and at a time individually chosen by them. This Article is also applicable to transmissions to and from a spacecraft."

The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement)

The topic of outer space is not expressly covered under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement). In addition to the national treatment principle outlined in Article 3, Article 4 mandates that any benefit, privilege, immunity, or favour that a Member grants to the citizens of any other nation must be promptly and unconditionally extended to the citizens of every other Member. This practice is referred to as "most-favorable-nation treatment." Furthermore, as per Article 27.1, patents must be accessible, and patent holders' rights shall be enjoyed without regard to the location of creation. Patents for innovations made in space must thus be awarded and enforced in the relevant jurisdiction following the same rules that apply to inventions made elsewhere, according to national law.

INTERNATIONAL PRINCIPLES CONCERNING OUTER SPACE

The main body of current international space law is contained in five international agreements:

1. The 1967 Outer Space Treaty [2], which regulates governments' use of space, including the moon and other celestial bodies, for exploration and development.
2. The 1968 Rescue Agreement, which addressed the rescue of astronauts, their return, and the return of objects launched into outer space.
3. The Convention on International Liability for the Damage Caused by Space Objects is one of the 1972 liability conventions.
4. The 1975 Registration Convention, a convention pertaining to the registration of space-launched objects.
5. States' operations on the moon and other celestial bodies are governed under the Moon Agreement (1979).

None of the agreements have a single clause that addresses intellectual property in any way. Nevertheless, it might help investigate whether modifications or exemptions to the ordinary laws governing intellectual property protection are necessary for space-related operations. As a result, nothing in the global arena discusses the application of intellectual property rights in outer space.

APPLICABILITY OF IPR IN VARIOUS ASPECTS OF OUTER SPACE

Satellite Technology

Patents can be obtained by businesses and organizations that develop and manufacture satellites in order to safeguard their cutting-edge technology, which may include solar panels, onboard sensors, propulsion systems, and communication antennae. The inventors or assignees of these patents are granted exclusive rights, enabling them to market their satellite systems and maybe grant technical licenses to other parties.

Spacecraft Design and Construction:

Spacecraft design, material, and manufacturing process innovations may be covered by trade secrets, copyrights, or patents. For instance, patent protection may apply to new lightweight materials or 3D printing methods used in spaceship construction, while copyright protection may be available for exclusive designs or software algorithms.

Remote Sensing and Earth Observation

Applications of remote sensing and Earth observation, such as satellite imaging and data analytics, depend heavily on intellectual property rights. Businesses that create sophisticated image processing algorithms, data fusion methods, or specialized apps for satellite data analysis might gain a competitive advantage in the market by using patents or trade secrets to protect their inventions.

Space Exploration Technologies

Technological innovations for space exploration, such robotic rovers, landers, and planetary mission homes, may be protected by intellectual property laws. National Aeronautics and Space Administration (NASA), for instance, is the patent holder of certain technology created for space exploration, such as robotic arms, landing gear, and life support systems, which can be licensed to other institutions for business or research uses.

Space Tourism and Human Spaceflight

The rights to intellectual property are important for developing industries like space travel and human spaceflight. Patents, copyrights, or trade secrets can be used by businesses creating spacecraft for suborbital or orbital flights, space habitats, or life support systems for crewed missions to safeguard their inventions. Furthermore, branding components linked to space tourism services, including trademarks or logos, can be registered for protection.

Space Resources Utilization

IPRs are becoming more and more crucial as interest in taking resources from celestial bodies and using them rises. Patents or trade secrets can be used to protect innovations in mining technologies, resource extraction strategies, and processing methods for space resources, such as water ice or minerals on the moon or asteroids, allowing businesses to profit from their investments in space resource utilization.

FUTURE CONSIDERATION IN IPR

The future consideration of IPRs in space is poised to become a critical aspect of space exploration and commercial activities beyond Earth [14]. If the fundamental problems associated with applying IPRs in space are resolved, the future of space exploration will be prosperous. In order to encourage innovation, investment, and sustainable development in the extraterrestrial realm, a framework for the protection and enforcement of intellectual property will need to be established as time goes on and humankind expands beyond space.

The most significant area of interest is the advancement of contemporary inventions and technology in space, from sophisticated propulsion systems to life-supporting technologies. Safety is essential for businesses and people funding space exploration research and development because it protects their intellectual property and creates an atmosphere that is favorable to advancement. To provide creators with the motivation to push the limits of science and technology, it will be essential that IPR regulations—including patents and copyrights—for space-based discoveries be clear.

Furthermore, the necessity for international collaboration and standardization in space IPRs becomes more apparent as space operations shift from governmental intervention to an increasing engagement of private companies. Establishing uniform legal frameworks that respect the rights of artists and innovators across various authorities would necessitate cooperative efforts [15–20]. In order to ensure a cogent and fair approach to space intellectual property rights, this cooperation should also encompass resolving possible disputes and overlaps between national and international regulations.

Apart from technological aspects, problems pertaining to the use of resources in space, including mineral extraction or mining asteroids, pose intricate queries concerning ownership and intellectual property rights. The development of legal frameworks that both allay these worries and balance the interests of many parties involved will be essential to the space commercialization of special space resources. All things considered, the future consideration of IPRs in space requires an anticipatory and cooperative legal framework that establishes the application of IPRs in space in order to commercialize the use of space, therefore aiding in the nation's economic growth [22].

CONCLUSION

The idea of IPRs in outer space is dynamic and a hot issue nowadays. The use of intellectual property in space is necessary due to the progress of contemporary technology and development. In the current modern context, intellectual property rights represent a novel way to safeguard an individual's intellect while maintaining a legal framework. When using the idea of IPRs in space, two requirements may need to be satisfied. The application of IPRs is contingent upon territoriality and sovereignty. The question of who owns space and which nations or states are responsible for it now emerges. There are many conventions and treaties related to outer space and, also, the WIPO did not deal with IPRs in outer space. Hence, there can be two challenges which might create hindrance in order to implement the IPRs in outer space. The way the existing legislative framework is resolved may have a lasting effect on the commercialization of space-related activities and may directly contribute to the growth and development of the nation's economy. Furthermore, the rights of intellectual property creators can be protected by the notion of territoriality and sovereignty.

Technology advancements have resulted in a massive paradigm change in space operations. The necessity of the hour is to apply IPRs and safeguard authors', inventors', and other rights under our space legislation considering the rise in space missions.

REFERENCES

1. The Paris Convention for the Protection of Industrial Property, March 20, 1883, 828 U.N.T.S. 305.
2. WIPO Copyright Treaty, Article 8, March 6, 2002, 2186 U.N.T.S. 121
3. Study.com. What Is Intellectual Property Law? [Online]. Study.com. Available at https://study.com/learn/lesson/what-is-intellectual-property-law.html.
4. Outer Space Treaty, October 10, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205. Available at https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html
5. The Moon Agreement. Agreement governing the activities of states on the moon and other celestial bodies, December 18, 1979, 1363 U.N.T.S. 3. Available at https://treaties.un.org/doc/Publication/MTDSG/Volume%20II/Chapter%20XXIV/XXIV-2.en.pdf
6. Law J, editor. A Dictionary of Law. 10th edition. Oxford, UK: Oxford University Press; 2022.
7. Reference. Available at https://www.oxfordreference.com/display/10.1093/oi/authority.20110803100408305.
8. Bouvet I. Certain Aspects of Intellectual Property Rights in Outer Space. Ottawa, Ontario, Canada: National Library of Canada; 1999. Available at https://www.nlc-bnc.ca/obj/s4/f2/dsk3/ftp04/mq64265.pdf
9. Sharma S, Pathak S. Patenting of outer space inventions: in the crossroads of territorial and outer space law. Dharmashastra Natl Law Univ Law Rev. 2022; 1: 175–182:.
10. Raju KD. Issues in protection of intellectual property created in outer space: an Indian outlook. In: Singh R, Kaul S, Rao SD, editors. Current Developments in Air and Space Law. New Delhi, India: National Law University Press; 2012. pp. 223–238. Available at http://www.commonlii.org/in/journals/NLUDLRS/2012/37.pdf
11. Vaishnavi V. To study the issues and challenges faced by intellectual property rights in outer space. [Online]. The Amikus Qriae. 2022. Available at https://theamikusqriae.com/to-study-the-issues-and-challenges-faced-by-intellectual-property-rights-in-outer-space/
12. Gabrynowicz JI, editor-in-chief. Journal of Space Law. 2007; 33 (Special Publication). University of Mississippi School of Law. Available at https://airandspacelaw.olemiss.edu/pdfs/biblio.pdf
13. United Nations Treaties and Principles on Outer Space. United Nations General Assembly. New York, NY, USA: United Nations; 2002. Available at https://www.unoosa.org/pdf/publications/STSPACE11E.pdf
14. World Intellectual Property Organization (WIPO). Berne Convention for the Protection of Literary and Artistic Works. (As amended on September 28, 1979) [Online]. Available at https://www.wipo.int/treaties/en/ip/berne/
15. World Intellectual Property Organization (WIPO) Copyright Treaty (WCT). [Online]. Available at https://www.wipo.int/treaties/en/ip/wct/
16. Gua Soutron. The Intersection of Space Laws and Intellectual Property Rights: A Narrative for Space Sustainability. [Online]. Available at https://gua.soutron.net/Portal/Default/en-GB/DownloadImageFile.ashx?objectId=4181&ownerId=1937&ownerType=0
17. Banerjee K. IPR for Outer Space Activity: Clarity Is a Necessity for Its Development and Draft Space Activities Bill in India. [Online]. Mondaq. September 5, 2023. Available at https://www.mondaq.com/india/patent/1393846/ipr-for-outer-space-activity-clarity-is-a-necessity-for-its-development-and-draft-space-activities-bill-in-india
18. Khurrana A. Space Law Protection the New Focus of IPR. [Online]. Khurrana & Khurrana. November 19, 2021. Available at https://www.khuranaandkhurana.com/2021/11/19/space-law-protection-the-new-focus-of-ipr/
19. Ifeanyi C. Feasibility of Legal Protection of Intellectual Property in Space. [Online]. LawPavilion. 2022. Available at https://lawpavilion.com/blog/feasibility-of-legal-protection-of-intellectual-property-in-space/
20. Kuey L. The Relationship Between Outer Space Activities and Intellectual Property Rights. [Online]. Kuey. 2022. Available at https://kuey.net/index.php/kuey/article/download/5456/3824/11346
21. Gangmeih P, Kuey L. A comparative study of IPR issues in India and Canada in space. Int J Innov Eng Technol. 2019; 13 (3): 101–104.
22. Sharma A. IPR Issues in Space Activities. [Online]. Legal Services India. 2018. Available at https://www.legalservicesindia.com/article/1866/IPR-Issues-in-Space-Activities.html

