



ISSUES AND CHALLENGES CONCERNING COPYRIGHT LAW IN RELATION TO THE OUTER SPACE


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“The imagination is an innate gift, but it needs refinement and cultivation; this is what the humanities provide.”

Martha Nussbaum

Article Info	ABSTRACT
<p>Article type: Research Article</p> <p>Article history: Received 12 October 2023 Received in revised form 14 May 2024 Accepted 25 June 2024 Published online 30 June 2024</p>  <p>https://ijicl.qom.ac.ir/article_2735.html</p> <p>Keywords: Copyright, Communication, Intersection, Satellite, Outer Space.</p>	<p>The 21st century is commonly referred to as the century of technological upgradation and digitalisation. A large section of the developmental activities that are taking place in our daily lives are due to the invention and exploration based activities that are being conducted by researchers, scientists and scholars from different nations. One of the most significant activities that have helped in shaping the country's future is the ability to forecast weather conditions, disaster situations, natural calamities and atmospheric health of a country and also of the world at large. This becomes possible because of the imagery and the information which are generated with the help of the satellites. Furthermore different categories of satellite also help in broadcasting such information and sending information to the masses through various modes of communication including the television and the wireless network mediums. The term invention is heavily dependent and interconnected with a particular discipline of law- the intellectual property right. The information which is generated by the satellites is considered as important creations. The main question that arises in this sector is whether such information is subject to protection under any scheme and specifically copyright regime of the intellectual property right domain. This paper focuses on the intersection between the copyright regime and the creations in relation to the outer space and what are the possible areas which are required to be focused on in order to establish a sound system of protection for such creations.</p>

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Introduction

The Earth that we dwell on is a part of the vast expanse of space which is often referred to as the outer space. The concept of outer space has not yet been given a fixed form of definition; however several scientists have approached several mechanisms in order to define the concept of Outer Space and what constitutes it. The term outer space has been interpreted by the existence of an imaginary line called the Von Karman line which lies a hundred kilometres above the earth's surface. The interpretation which is often followed is that any property which lies beyond this imaginary line is considered to be a property of the outer space. The existence of this imaginary line helps in segregating the space which belongs to various jurisdictions of and within the Earth's area from the extent of the Outer Space. The 21st century is often recognized as the century of mass digitalization and technological up-gradation. In order to materialize this facility and feature, it becomes extremely important to explore various aspects of Earth as well as that of the outer space so as to increase connectivity at various levels.¹

The research and development based activities have increased specifically during the 21st century. The multidisciplinary approaches in such research and development have enabled the residents of this planet to understand and acknowledge how various disciplines of study can be made to interpret with one another in order to provide the technological applications with sufficient flexibility and suavity.² While dealing with multi-disciplinary approaches, two of the most prominent fields that are being researched upon continuously and extensively include the Intellectual Property Rights regime and the Outer Space. The history that follows these two respective fields reveal that their existence came at different time periods but currently they are being researched upon simultaneously in order to recognize the possible existence of an intersection between them and explore this intersection in a much more stable manner.³ While, deciphering the timeline of intersection that exists between these two separate fields, a certain point becomes indispensable in the discussion.

¹ European Union's Database directive 96/9/EC of 1996

² Retrieved from <https://www.aspistrategist.org.au>, last accessed on July 16, 2023.

³ Retrieved from <https://iprlawindia.org/wp-content>, last accessed on July 20, 2023.



The objective to understand the timeline of evolution becomes important in order to recognize the fact that there are several areas which are still being worked upon in order to understand the possible intersection that exists. The concept of Intellectual Property Right (IPR) came to be recognized much later in comparison to the concept of Outer Space. However the law in relation to IPR became recognized much earlier in contrast to the law that safeguards and protects the Outer Space. The first official recognition to the intellectual property right regime was given in the form of the Paris Convention in the year 1883.¹ Following the Paris Convention, a worldwide recognition and acclamation was given to this domain by means of bringing the Berne Convention into existence in 1886.

By the 20th century, most of the conventions in relation to the IPR and a global recognition of the same had already come into existence. In fact following these conventions, numerous domestic legislations had already started being inculcated into the system as a result of which such legislations could be made much more sharp-edged and refined. There were extensive research based activities which were being constantly conducted in IPR especially during the latter part of the 19th century. On the contrary, the recognition of outer space was an act which was already given shape and form to during the 12th century. Several scientists devoted their time in an activity which was referred to as stargazing which involved an observation conducted in relation to the celestial bodies in order to understand their position, their activity and their basic features. However this activity was purely scientific and no scope of establishing its connection with law could be traced.²

It was during the Second World War that missiles {referred to as Vengeance weapons (termed as V2 missiles)} were launched by the German army (from 1942-1945). As an aftermath of the same there were several casualties. This made the countries in power realize how outer space can be used for multifarious purposes and how they can serve as the future of the upcoming generation.³ The very initial phase that followed this realization was clouded by the stakeholders of power trying to manipulate their ways in order to encroach a larger portion of the Outer Space.⁴ The United Nations which was formed as an aftermath of the Second World War had given rise to the United Nations Office of Outer Space Affairs⁵ (UNOOSA) which became one of the significant bodies in deciding affairs in relation to the outer space.

The United Nations Office for Outer Space Affairs (UNOOSA) works to help all countries, especially developing countries, access and leverage the benefits of space to accelerate sustainable development. Work toward this goal is achieved through a variety of activities that cover all aspects related to space, from space law to space applications.⁶ It was assisted by the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) in framing of legislations and rules that would help in maintaining sufficient law and order in relation to the Outer Space. As a consequence of the Second World War the, Soviet Union and the United States of America divided the world into two orders and they were consistently trying

1 Retrieved from <http://stage.tksc.jaxa.jp/spacelaw>, last accessed on July 20, 2023.

2 Retrieved from www.nasa.gov, last accessed on July 17, 2023.

3 Retrieved from <https://www.legalservicesindia.com>, last accessed on July 17, 2023.

4 Retrieved from <http://digitalcommons.unl.edu>, last accessed on July 18, 2023.

5 Retrieved from <https://www.unoosa.org/>, last accessed on July 31, 2023.

6 Retrieved from <https://www.unoosa.org/oosa/en/aboutus/roles-responsibilities.html>, last accessed on July 20, 2023.



to dominate the remaining countries not only on the earth as well as in the Outer Space. As a result of this tumultuous affair, it was soon realized by the remaining nations under the United Nations that unless a social and legal order is being brought which was ratified and backed by the world at large, either of these countries or both of them would soon become the *dominus* (master) of the Outer Space.¹

Thereafter the committee decided among its members and brought forth five treaties which have been ratified by most of the nation states and serve as the torch-bearers in determining the activities in relation to the Outer Space. This often brings one of the most important issues into light - whether the outer space can be treated as a separate domain. In order to restrict and restrain the activities conducted in the outer space the committee decided that there must be the presence of a factor which will treat the outer space in the same manner as the high seas are treated and there must be a jurisdictional approach brought within the bounds of this particular domain. The Outer Space Treaty recognizes the outer space as a separate domain by bringing the extra-territorial approach within its forte. This enables any and every nation state to be recognized once they send their entity into the outer space and the recognition is given on the basis of few determining criteria which are once again a part of the five treaties.²

The Liability Convention and the Registration Convention when read together, gives an insight into the fact that any space ship which is sent to the outer space will have jurisdiction over the activities which are conducted within such spaceship and the jurisdiction will be in relation to the nation state who is responsible in launching the concerned spaceship into the Outer Space. This has materialized effectively into determining the jurisdictional approach. Another important factor that has helped in deciphering the fact that no nation state can ever become the sole master of the outer space is the principle of common Heritage of mankind.³ This principle has been effectively mentioned under the outer space treaty and it provides that while every nation state has freedom of access and freedom of using the space resources for exploration based activities, there can be no appropriation of the property that is a constituent of the Outer Space. This principal can be commonly equated with the principle of Res Communis - meaning property belongs to the community at large and it further ensures that no individual claims ownership over any of such outer space related property.⁴

The fact that the principle of Common Heritage of Mankind in relation to the outer space is strictly against appropriation has been firmly established under the Outer Space Treaty. Since the last three decades the field of inter-disciplinary study has made great progress especially in relation to the domains concerning Trademarks and Patents.⁵ One of the most important exploration based activity in relation to the outer space is establishing its linkage with the IPR regime. In fact, the trademark related activities that are currently being determined in relation to the outer space has increased manifold, however the concerns in relation to the copyright legislation have a lot more scope of being worked upon.⁶ As a result of the difference in their

1 Retrieved from <https://www.ifrc.org>, last accessed on July 19, 2023.

2 Retrieved from <http://www.newworldencyclopedia.org>, last accessed on July 12, 2023.

3 Retrieved from <https://www.wipo.int/export/sites>, last accessed on July 20, 2023.

4 Retrieved from <http://articles.adsabs.harvard.edu>, last accessed on July 20, 2023.

5 Akaanksha Mishra, 'The Indian Journal of Intellectual Property Law' (2014-2015) 7 85.

6 See Indian Journal of Air and space Law (IJASL), Vol III, 20-60



timeline of evolution, the intersection between these two domains had not been effectively identified. As a result of this, even in the 21st century there are still numerous areas lying on their interface that have not yet been recognized and a legal regime recognizing this intersection becomes indispensable.¹

1. Principles Concerning IPR (With Reference to Copyright) and Outer Space: Establishing a Balance

One of the most important ventures that follow the identification of the linkage between these two regimes is determining whether they are contradicting at any point especially in relation to the principles that have helped in their respective evolution. While doing so it has been found out that on numerous occasions the principle that underlies the IPR regime is mainly revolving around the principle of exclusive right. The reference of the same has been found in the Two Treatise Theory of John Locke's Labour Theory.² He states that any property that belongs to the public and the community at large can also eventually become an individual's property. A certain property on which labour has been invested and appropriation has been conducted by an individual will lead to the end product being a commodity over which the individual will have an exclusive right. Therefore the term appropriation becomes an important aspect under the IPR regime. The Outer Space Treaty on the other hand clearly prohibits any appropriation related activity taking place in the Outer Space. This leads to a significant collision of the principles and raises the question as to whether any IPR based activity that takes place in relation with the outer space, appropriates any property that belongs to the outer space.³ For determining this, the constituents need to be interpreted.

1.1. What Is Meant by Property of Outer Space?

The outer space domain initiates from a distance of 100 km above the Earth's surface. Anything that lies beyond and imaginary line termed as the Von Karman line is considered to be a property of the Outer Space. While determining what are the properties present in the outer space over which a claim of ownership cannot be exercised, Article 2 of the Outer Space Treaty provides that it constitutes Moon and other celestial bodies thereby stating the fact that any celestial body present in the outer space will be termed as a property of the outer space. The European Space Agency while determining the constituents of outer space has stated that asteroids and meteors will also be considered as celestial objects and they are properties of the outer space. However a satellite which has been sent by the Earth to the outer space will not be referred to as a body of the outer space because there is an exception in such cases where the doctrine of extra territorial jurisdiction applies to the respective satellite which has been sent by a particular nation state. Therefore the principle of Common Heritage of Mankind will be applicable to anything and everything that is present in the outer space except any commodity which is being sent by the Earth to the Outer Space.⁴

1 WIPO, 'Symposium on Broadcasting, New Communication Technologies on IPR' (1998).

2 Retrieved from <http://www.esa.int/esapub/bulletin>, last accessed on July 28, 2023.

3 Retrieved from <https://www.inta.org/perspectives/features/ip-in-outer-space-the-next-frontier>, last accessed on July 22, 2023.

4 Article VII of Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 1967



There lies a certain exception to this aspect. It has been stated by a resolution by the International Institute of Space Law (IISL) that any asteroid or meteor that lands on the earth from the outer space no longer remains a property of the outer space and becomes a property of the nation state wherein it has landed.¹This allows the concerned nation state to conduct any research-based activity on the meteor without having to compromise the anti-prohibition principle.²However at the same time it also raises a particular question as to whether the body which is being sent from the Earth to the outer space for conducting exploration and research defies the prohibition principle and appropriates any of the outer space resources. In order to determine the same it becomes significant to understand and interpret the term appropriation and how the body specifically the satellites which are being sent from the Earth to the outer space functions.³

1.2. What Is Meant by Appropriation?

The term appropriation has not been defined particularly and specifically. Neither is there a universally accepted definition in this respect. There have however been numerous instances where the term appropriation and the interpretation of this concept have been dealt with under various regimes involving property law and the outer space. Oxford Dictionary has conceptualized this term as an incident wherein a certain individual uses and takes over the property of another individual without the consent and knowledge of the latter. Therefore in relation to space law, appropriation can be enabled only with the consent of the owner of the property since ownership has been given to the public at Large in other words it cannot be appropriated without the consent from the entire world population which is practically not possible thereby making it a domain which cannot be appropriated.⁴

Another reference can be drawn in order to understand the term appropriation. Arthur Goldberg who was the permanent representative to the United Nations Office of Outer Space Affairs of the United States had chalked down the concept of appropriation in his paper which is submitted under the International Astronautical Congress in June 1966. Before the Outer Space Treaty came into existence, numerous interpretations of the terms which were to be included under various provisions of the treaty was being discussed in order to decipher⁵ their meanings in relation to the concerned treaty. In the papers submitted before the International Astronautical Congress, the term appropriation has been interpreted in three manners that includes setting apart any constituent of a particular material from its original content, or using a matter or commodity in a manner that would amount to consumption of the commodity or using a Celestial body in a manner that would result in disruption of motion of the commodity or body.⁶

These definitions have been identified as official interpretations of the terms and concepts

1 Retrieved from <http://www.unoosa.org/documents>, last accessed on July 22, 2023.

2 See C. Garmon, 'Intellectual Property Rights: Protecting the Creation of New Knowledge across Cultural Boundaries' (2002) 45 *American Behavioural Scientist* 1145.

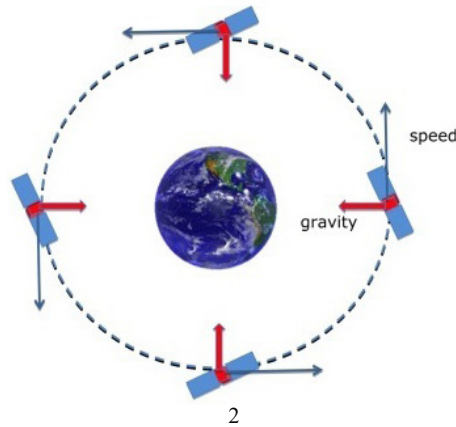
3 Retrieved from <http://www.cops.usdoj.gov/mime/open.pdf?Item=1729>, last accessed on July 22, 2023.

4 Retrieved from <http://www.arl.org/scomm/copyright/copyright.html>, last accessed on July 22, 2023.

5 See Barbara Luxenberg and Gerald J. Mossinghoff, 'Intellectual Property and Space Activities' (1985) 13 *Journal of Space Law* 8.

6 Hanneke Van Traa-Engelman, 'The Commercial Exploitation of Outer Space: Issues of Intellectual Property Rights and Liability' (1991) 4 *Leiden Journal of International Law* 303.

which have been laid down under the outer space treaty. This decision was agreed to in the United Nations Celestial Bodies Convention.¹ Articles 38 of the International Court Of Justice Statute while determining what all constitutes international law has laid down that conventions are also considered to be an international law does the terms which have been given an official recognition by the United Nations celestial bodies convention are also to be considered as a part of universally accepted international law.



1.3. Functioning of an Artificial Celestial Body: Appropriation or Mere Use?

In order to decipher whether a satellite which is being sent from the Earth to the outer space is committing itself to any activity that is resulting in appropriation, it becomes indispensable to understand the technicalities of how a satellite functions. A satellite is released with the help of a rocket from a particular Space Station. It leaves its designated space station with a particular velocity which is generated with the help of the chemical reactions taking place at the rear end of the rocket. The operational activity of the satellite once it reaches the outer space is controlled to a larger extent by mechanisms which are pre-designed and partly by the space station which has launched the same. Thereafter the satellite locates itself on a targeted orbit and starts moving along the particular orbit.³

In case the satellite uses the energy or any other property which is a constituent of that particular orbit, the activity will be categorized under an appropriation based activity.⁴ However what happens is that the satellite is balanced by two forces acting on it in a centrifugal and centripetal manner please stop these forces are the velocity which it has gathered from the rocket launcher and the gravitational force which acts towards the Earth. Both these forces act in a perpendicular manner thereby allowing and enabling the satellite to move along its orbit. Therefore it can be concluded from the above mentioned principles and their subsequent derivations that a satellite while helping in collecting information (that will later on be subject to copyright protection) moves with the help of a balancing mechanism and is in no way appropriating any property of the outer space. This further assists in concluding that although the principle of appropriation has been strictly prohibited under the principle of Common

1 Retrieved from <http://www.unoosa.org>, last accessed on July 22, 2023.

2 Retrieved from <https://www.sciencelearn.org.nz/resources/268-gravity-and-satellite-motion>, last accessed on July 16, 2023.

3 Retrieved from <http://web.mit.edu>, last accessed on July 17, 2023.

4 See Alexander N. Sack, "The Doctrine of Quasi-Territoriality of Vessels and the Admiralty Jurisdiction over Crimes Committed on Board National Vessels in Foreign Ports" 12 N.Y.U. L. Q. Rev. 628 (1935)



Heritage of Mankind, the activity which the satellite undertakes is use and exploration devoid of appropriation and therefore the Intellectual Property Rights mechanism which is applicable in the outer space is not contradicting with the principal which has helped in shaping the outer space domain.¹

2. Copyrightability of Information Generated by Remote Sensing Satellite

The remote sensing satellite occupies an immensely significant role under the copyright regime. There are various activities which are performed with the help of the remote sensing satellite which in turn amounts to being extensively used by various departments, researchers and different organizations thereby making it important to highlight the boundary of copyright protection laws which may be applicable to the information generated with the help of such satellites. Before identifying the type of works which are generated with the help of these categories of satellites, it becomes indispensable to highlight how these satellites function so as to understand and emphasize how the work is actually being generated with the help of these satellites.

2.1. Mechanism of Launching and Functioning of Space Ships and Carriers in the Outer Space

1. One of the most important aspects of outer space is the launching of satellites into the outer space by various National and international, private and government based Space Research Organisations. Apart from any kind of naturally occurring celestial body that rotates or revolves around a certain orbit, there are thousands of artificial bodies which move around in several directions in the space and these are referred to as satellites. Satellite in isolation cannot be launched into the space.²For this reason, satellites are at first launched on to space vehicles or rockets having numerous propellants. These rockets are then launched with a certain escape velocity into the outer space or on any celestial body. Following a successful launching on any intended orbit or celestial body, the satellites now examine all the kinds of existing forces, texture, pattern and activity of the Earth or other celestial bodies in the atmosphere that surround them and send information to the operating body which is generally the Space Research Organisation.³
2. After the satellites have been launched in the outer space, the satellites can either revolve around the earth in order to examine the prevailing conditions surrounding the earth or send such information back to the Space Research Organisation which launched it. The satellites can also revolve around some other planet to examine the conditions existing around the planet or the existence of any kind of unknown space debris, black hole or any other kind of unnamed and unknown celestial body. When a satellite is being launched in order to orbit the earth's rocket having an ordinary escape velocity is generally launch because such velocity is transferred to the satellite and the

¹ Retrieved from <http://www.copyright.com.au/reports%20&%20papers/CCS0202Berne.pdf>, last accessed on July 19, 2023.

² Brussels Convention Relating to the Distribution of Programme-carrying Signals Transmitted by Satellite, May 21, 1974.

³ Retrieved from <https://opengeospatialdata.springeropen.com>, last accessed on July 18, 2023.



satellite possesses the momentum and the energy that has been transferred by the satellite which has been launched. The International Space Station launched and established 20 years by the National Aeronautics and Space Administration (NASA) of USA orbits around 250 miles above the surface of the earth and the velocity with which travels is a round 27595 km/hour.¹

3. When the discussion of satellite is broached upon, the most important and significant satellite that needs to be maintained, sent, recorded and operated from most of the space research stations is the geostationary satellites located on a Geo-synchronous orbit. A geostationary satellite is an Earth orbiting satellite but the main difference between other satellites orbiting the earth and a geostationary satellite is that it is placed at a higher altitude of around 35,000 km above the equator and such satellites are made to revolve around the earth.²The entire world in the 21st century is closely surrounded and assisted by numerous technological appliances and gadgets that help in understanding how the Earth is working. In today's civilization it has become indispensable for every organisation and every entity to understand and foresee³ from⁴ the present how the future may take shape. In fact, it is the same factor that regulates the density of population in a particular arena along with what are the possible economic conditions that will thrive in a particular area and every other accessory matter.⁵
4. The matters in relation to cultivation, farming activity, industrialization and commercialization of such matters are largely and heavily dependent on the weather and climatic conditions of a particular place. Apart from this there is another issue that becomes inevitable and must be addressed- the accessibility of roads for the purpose of easy communication and transportation which also plays an important role in determining the quotient of industrialisation that in turn determines whether that particular place is developing, under-developed or a developed arena. All these matters are nowadays easily determined with the help of a particular artificial celestial body or in short satellites. Apart from these two functions, there is another facility that has become very important in our daily lives. A well-built stretch of road is undoubtedly important to maintain communication but at the same time communication can also be well maintained using software platform and Social Medias. The news that we retrieve with the help of antenna and satellites which are broadcasted from all across the world help in ascertaining the on-going situation of other region and places along with other countries throughout the entire global scenario.⁶
5. For the purpose of study and limiting the scope of application of this particular paper, the researchers have divided the type of satellites used in space into two broad

1 For details, visit https://www.nasa.gov/mission_pages/station/main/index.html, last accessed July 31, 2023.

2 WIPO The WIPO Treaty on the Protection of Broadcasting Organizations: Informal Paper circulated at the SCCR meeting Geneva (3-7 November 2008)

3 Retrieved from <https://www.spiedigitallibrary.org>, last accessed on July 19, 2023.

4 Retrieved from <https://www.semanticscholar.org/paper/Copyright-protection-of-remote-sensing-imagery-by-Barni-Bartolini/d44f73749bf3f8b96cd5c296a8661933b35b79b1>, last accessed on July 19, 2023.

5 Retrieved from <https://spacelaws.com>, last accessed on July 18, 2023.

6 Reliance for such argument may be made on basis of several international IP legal regime viz. WIPO Convention, 1967, Berne Convention, 1886, Paris Convention for the Protection of Industrial Property, 1883, TRIPS, 1995



categories constituting of Remote sensing satellites and direct broadcasting satellites. It becomes pertinent to mention that the work¹ and the creation that is an outcome of the functioning of these satellites in the outer space becomes an important commodity of protection and their four becomes a subject matter of copyright. The satellites are placed in the Geo-synchronous orbit where-from they are operated by various² Space Stations in order to gather information on the occurrence of any incident or similar information that is taking place in the outer space or in order to analyse and process the information in order to understand what future weather conditions may look like.

6. From a holistic point of view, the Remote Sensing Satellites initiated the entire process of acquiring information about any phenomena or object that is placed in the outer space or can be investigated from the outer space and further analyse such information in order to provide to the public with a more refined end product. The eyesight of human beings being restricted within a biologically defined frequency, electromagnetic emissions from various matters³ and materials present in the outer space cannot be seen without the help of specially manufactured machines. NASA has defined the term Remote Sensing Satellite as artificial satellites which sensors and detects energy which is emitted by the earth and reflected from the Earth's surface. Sensors are energy detecting machines which are fitted onto the satellites. The data is generated with the assistance of the satellites but the data produced are of various categories and can be classified as raw data, processed information and enhanced information. These data are subject to copyright protection however not all the categories of data will be protected under the intellectual property regime.⁴

2.2. Types of Information Generated

The Remote Sensing Satellites which are being used in multiple sectors and currently have a holistic and multifarious use are renowned for generating a wide variety of contents which upon examination reveal what are the specific characterizations that make up these categories of information which are generated with the help of the concerned class of satellites. The sensors which are attached to these categories of satellite record the electromagnetic radiation that it receives from numerous objects present on the earth. The frequency of these radiations varies as a result of which the radiations which are recorded also differ.⁵ These signals then send the recorded radiation with the help of signals to the receiving stations which are located inside the various space stations on the earth. Scientists who receive and collect this data generally retrieve the information by means of a process called transcription.⁶

The information that is displayed on the computer system which are connected to the antennas responsible for receiving signals from the Remote Sensing Satellites are in binary

1 Retrieved from <https://www.terisas.ac.in/uploads/NRG162.pdf> (last accessed on 20th July, 2023)

2 See Arthur Raphael Miller and Michael H. Davis, *Intellectual Property: Patents, Trademarks, and Copyright in a Nutshell* (3rd edn, West Group 2000).

3 Retrieved from <http://spacenews.com>, last accessed on July 19, 2023.

4 Retrieved from <http://www.wipo.int>, last accessed on May 6, 2023.

5 Retrieved from <http://www.esa.int>, last accessed on May 6, 2023.

6 Retrieved from <https://digitalcommons.unl.edu>, last accessed on May 6, 2023.



digits. This in order to be made available as a piece of information is required to be transcribed from binary language to a commonly accepted language. While doing so a certain quantum of labour, skill and judgement are applied by the scholars and this in turn are invested in the process of transcription.¹ The European Space Agency and the National Aeronautics and Space Administration while determining what are the main activities which are involved in the process of transcription has stated that the scientists are responsible for mainly three categories of activities. This includes translation, spatial filtering and mosaic enhancing.

It has been held in *Mason v/s Montgomery Data, Inc.*,² that maps are generally not copyrighted. However if and when any creative compilation is taking place in relation to the maps such as addition of information which are unique to the creator or a certain portion of the commonly available political map is being highlighted in order to add value to the existing piece of art, the result which is generated as a result of this value addition that takes place by means of modicum of creativity and becomes a subject matter of copyright protection. Therefore the effort which the scientist puts into undergoing the process of transcription becomes important in the light of copyright legislation. The content that is generated by means of this effort is of two categories and includes imagery and information. While the former falls under the category of artistic work and are protected under the Indian as well as all other important copyright legislations across the world, the latter forms a part of literary work and are equally entitled to receive copyright protection.

The National Aeronautics and Space Administration has categorised the nature of the information that is generated using a remote sensing satellite into two categories and it consists of raw data and analysed information. The analysed or enhanced information can further be classified into primary information and secondary information. While the primary information consists of information that is generated after a process of transcription, the secondary information includes literary work which is generated after the primary information has been analysed time and again and a process of compilation has been implemented. This category of work does not include mere compilation. The compilation involves a creative component and includes sufficient modicum of creativity for the information to be granted copyright protection under various legislations across the world. In this respect few cases that become important.³

In *Burrow-Giles Lithographic Company v. Sarony*⁴ the question that was asked in this case is whether a photograph will constitute sufficient components to be granted copyright protection in the light of the fact that the picture that has been captured is of an incident or entity or occurrence that forms a part of the public data. While deciding this case the US Supreme Court held that photographs are subject matters of copyright protection because it involves sufficient quantum of skill, labour and sheer judgement that becomes important in determining what angle the camera has to be positioned in order to capture a picture or what will be the dimensions of a lens aperture and⁵ even what are the surrounding conditions of light reflection

1 Retrieved from <http://arstechnica.com>, last accessed on May 6, 2023.

2 *Harris v. Bexar County* 765 F. Supp. 353 (S.D. Tex. 1991).

3 Retrieved from <https://iprlawindia.org/wp-content/uploads/2018/01/IPR-and-Outer-Spaces-Activities-final.pdf>, last accessed on July 20, 2023.

4 *United States v. McGowan* 111 U.S. 53 (1884).

5 Sharma, 'Copyright Protection over Sports Broadcasts: A Global Perspective' (Paper presented at the 60th ABU Sports Group Conference, Hong Kong, May 2017).



that are to be allowed to exist when the picture is being captured. These characteristics constitute sufficient modicum of creativity in order to grant a photograph copyright protection even under the Indian jurisprudence.

3. National and International Legislation Recognizing Copyright Protection of Satellite Imagery

The information generated with the help of the Remote Sensing satellites are of two categories and can be divided into artistic and literary work. In India while the entire scheme of protection was initially garnered with the help of the Indian Copyright Act, 1957 recently the Remote Sensing Data Policy, 2020 has helped in identifying the ownership over the information or the imagery which are developed with the help of such categories of satellites. While it recognizes the ownership and clearly distinguishes between the different entities that are to be deemed as the owners, there is still a lot more scope in establishing the difference between the raw data and analysed data and detecting the thin line of difference that would make an information or imagery subject to copyright protection. In the international scenario, the International Telecom Union has helped in identifying the information as a subject matter of protection under the Intellectual Property Rights.

The World Intellectual Property Right Organisation based three conventions and the Berne Convention recognizes such categories of work as literary or artistic work. The European Union or the United States have their own set of legislation protecting such information within their territorial jurisdiction. However an international convention dedicated purely towards the protection of information or imagery generated with the help of satellite is yet to be formed in order to promote a sound and stable protection scheme that may be accepted by all the nation states across the world in order to eradicate any kind of ambiguity in the interpretation of the constituents.

3.1. Direct Broadcasting Satellite

The second category of satellite that occupies immense significance and is the next subject matter of discussion of the concerned paper is the functioning of direct broadcasting satellites. The definition of this category of satellites which has been laid down by the Indian Ministry of Electronics and Information Technology is that it is a type of satellite that falls under the category of Fixed Satellite Service and is responsible in availing radio-communication. It enables the transmission of signals from the ground station to the satellite positioned in the Geostationary Orbit and then receives the signals which are sent to the receiver stations via antennas. Scholar Bruce Patton has laid down a simplified understanding of how a Direct Broadcasting Satellite (DBS) operates. He has stated that there are a total of five constituents of such types of satellites:¹

- a. Ground station
- b. Uplink
- c. Direct Broadcasting Satellite
- d. Downlink

¹ Retrieved from <https://encyclopedia2.thefreedictionary.com/Direct+broadcasting+satellite+systems>, last accessed on July 23, 2023.



e. Broadcasted Content

When the concept of DBS is being discussed, the main question that is generated is the copyright issue pertaining to the broad-casted content. The copyright-ability of the same has been firmly established on the grounds of being an original content that is credited to the creator. The content which is generally broadcasted includes a work of the nature of sound recording or cinematography. This has been identified to be eligible for protection under copyright legislations in most of the important statutes across the world and therefore it is no longer a questionable aspect under the copyright regime.¹ The entire network that is stimulated and prepared by means of the mechanism of broadcasting involves two prominent features which are termed as the up linking and down linking of signals to and from the stations to the satellite.

With the signals being an inseparable part of the broadcasting network, one of the most prominent contributions that are enabled with the help of these signals is the entertainment industry and the communications industry that takes place with the help of the broadcasted content. Adding to this enormous industry, there is another covert feature present which may not be visible to our naked eyes. It definitely is one of the most important aspects of this entire mechanism and procedure thereby helping in enabling the generation of the signals.² The question that follows this is whether the discussed feature needs to be protected under any scheme of copyright legislation and whether there lies any prima facie danger that affects the existence of such features.

3.2. Decoding the Mechanism of DBS

For the purpose of understanding the aspects of a direct broadcasting satellite and in order to determine the need for protecting the same, it becomes pertinent to understand and decipher in the simplest manner as to how the mechanism of this category of satellite functions.³ The ground station comprises numerous computer systems which are attached through wireless modems to antennas which are located in various parts of a concerned region from where the ground station operates or which comes under the authority of the ground station. The antennas are connected not only to the ground station but also with the receiver station at various corners of the world all of the country which comes under the purview of a particular broadcasting system. These antennas are responsible for capturing the signals, sending the signals and receiving the signals directly or indirectly from the concerned direct broadcasting satellite.

The transmission of signals takes place in the manner of thunderstorms wherein we often find electromagnetic radiations reaching the Earth's surface. In a similar manner the signals are generated and sent with the help of antennas to the desired satellite which has an amplifier attached to it. There is a change of frequency taking place within the satellite and the signals are changed in order to be redistributed among several receiver stations with respect to the frequencies and are sent back with the help of antennas to the ground stations. The next important aspect that comes into the discussion is what helps in the generation of signals and what the need of protecting signals is. In the year 2021/2022 when the evils of the covid-19 pandemic

1 Retrieved from <https://hbr.org/2021/02/the-commercial-space-age-is-here>, last accessed on July 18, 2023.

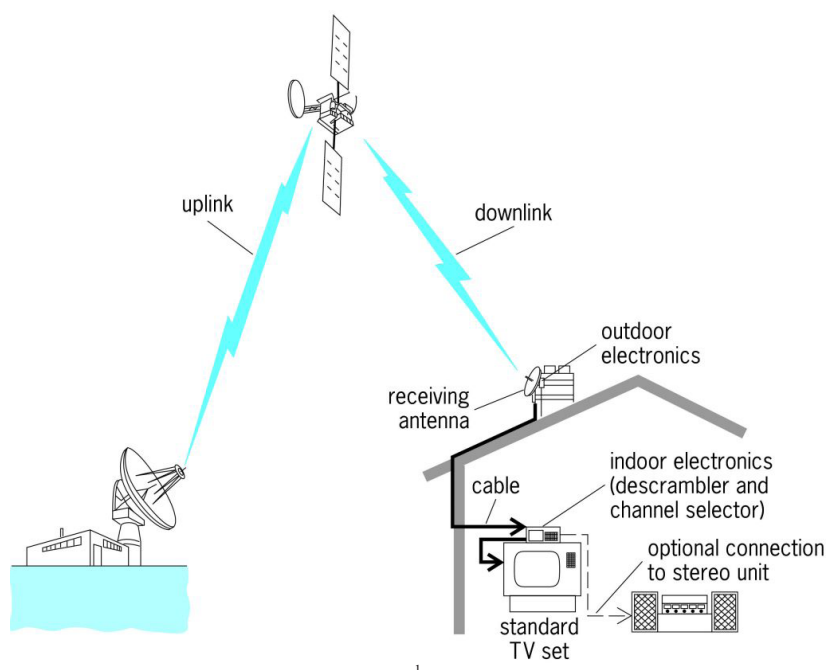
2 Retrieved from <https://theconversation.com>, last accessed on July 18, 2023.

3 Retrieved from <https://www.thebalance.com/nasa>, last accessed on July 18, 2023.



was very feebly withdrawing itself and the world was still confined within the limits of their respective houses and internet services, one of the most important source of entertainment was the contents which were being broadcasted.

However with regards to the Indian perspective it was found out that India became the greatest sufferer because of illegal data interception and signal piracy- an incident that was reported by the Star India Pvt Ltd. Media house as well. The ownership over the signals can be related with the owners of media houses who are responsible in generating the broadcasted content. When a case of signal piracy occurs, the media houses are the worst sufferers followed by the artists and this results in a decreased revenue generation from a sector which otherwise is capable to generate a high quantum of revenue.



This brings into notice the importance and relevance of signal protection and the relevance of bringing a completely separate legislation recognizing the existence of the mechanism of direct broadcasting, each and every constituent of such a broadcasting system and giving protection to the elements along with recognizing the entity who is to be considered as the owner of such elements. The concept of signal protection traverses back to the contents or information or any category of work which helps in generation of the signals.²The computer system which helps in generation of these signals are to be operated by inserting a certain category of programming which are often referred to as computer programs and in specific which are referred to as source code. The question of protecting a source code comes under the copyright legislation and more specifically under the literary work of copyright. Both the Copyright Act of India and the TRIPS Agreement expresses that 'computer programs', whether in source or object code, shall be protected as literary works under the Berne Convention 1971.³ The main issue with the source code or the object code

1 Retrieved from <https://encyclopedia2.thefreedictionary.com/Direct+broadcasting+satellite+systems>, last accessed on July 23 2023.

2 See Matthew Weinzierl and Mehak Sarang, 'The Commercial Space Age Is Here' <https://hbr.org/2021/02/the-commercial-space-age-is-here> accessed 18 July 2023.

3 Retrieved from <https://www.thebalance.com/nasa>, last accessed on July 18, 2023.



which is generated in relation to the production of signals is that they are being recognized under the copyright legislation and as a result of the same the lack of a protective regime enables signal piracy and various other offenses to be committed in relation to the signals.

3.3. International Instruments Recognizing DBS Under the Copyright Protection Scheme

Therefore the primary need to protect signals that are being emitted with the help of the computer generated systems should be dealt with not only under the copyright legislation but also under a separate mechanism. Such signals prove to be of utmost importance in relation to carrying information, entertainment related contents and news and communication related contents all across the world. The international instrument that has been discussed by the Brussels Convention¹ recognizes the entity of signals granting them an indirect mode of protection. However the main problem with this convention is the fact that the Brussels Convention lacks a regulatory authority or a mechanism of regulation and as a result of the same the main issue that arises is lack of a system that can grant the signals effective protection.²

The International Telecom Union is a conference that is held at regular intervals discussing the eminent issues in relation to telecommunication, network, signal and service providers with an objective of uniting and consolidating the existing rules and regulations especially in relation to International Communication System that takes place by means of telecommunication with the help of satellites. This conference recognized the efficiency of Direct Broadcasting Satellite and the need to protect every constituent of this satellite so as to ensure that there is no piracy related activity taking place in relation for the same. However the fact that the computer generated programs must be given a separate protection in order to facilitate a double protection mechanism for the entire scheme has not yet been recognized by the international instruments.³

3.4. Indian Perspective

India has undoubtedly upgraded herself in terms of satellite connectivity and the laws which are protecting the actions or the information which are generated with the help of the satellites. The main factor that is effectively lacking in this aspect is that there is the absence of a specific legislative mechanism granting protection to the individual elements of a satellite. An approach towards formation of a consolidated bill was undertaken in 2001 however it lapsed in 2004. The main objective of this bill which was termed as the Communications Convergence Bill, 2001 was the intention of consolidating the following rules and regulations and bringing them under one canopy in order to make the interpretation of the terminologies surrounding the direct broadcasting satellite easier and in order to further any protection scheme that has not been recognized in the existing legislations.

1. Indian Telegraph Act, 1885
2. Indian Wireless Telegraph Act, 1993

¹ Brussels Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite, 1974.

² Retrieved from <https://escholarship.mcgill.ca>, last accessed on July 18, 2023.

³ Catherine Doldirina, "Intellectual Property Rights in the Context of Space Activities" in Frans Von der Dunk and Fabio Tronchetti (eds), *Handbook of Space Law* (Edward Elgar, UK, 2015) 958.



3. PrasharBharti Act, 1990
4. Telecom Regulatory Authority of India (TRAI) Act, 1997.
5. The Cable Television Networks (Regulation) Act, 1995
6. SATCOM Policy, 1997

The lack of recognition of the essential elements and more specifically every individual element arising out of the system that comprises the direct broadcasting network has led to numerous cases of interception which are the only illegal and this has in turn resulted in a situation where signal piracy is taking place at an enormously higher level.

Conclusion

A comprehensive analysis of the outer space affairs in relation to the intellectual property right and more specifically the copyright related issues reveal the fact that there are numerous areas which have not been discussed in details from an inter-disciplinary point of view. The term inter disciplinary has been used in order to reciprocate the interface that arises out of the common boundaries of the outer space domain on one hand and the Intellectual Property Rights regime on the other. Unless the overlapping factors that exist between these two disciplines of law are recognised, the constituents of the overlapping area will not be efficiently recognised. This can be identified in the fact that although the Remote Sensing Satellites and the Direct Broadcasting Satellites occupy an immensely important role of the daily lives of human beings, there are very few laws even in the 21st century that protect the information which is generated with the help of these satellites.

The 21st century emphasizes majorly on the creation and the rights of the creator. Unless the information from the satellites are being recognised officially to be falling under the copyright regime and a sound system of protection is being set up for the same, that chances of exploitation, interception and piracy in relation to such information become easier there by completely neglecting the right of the creators. The reciprocal protection of copyright has been recognized on an international platform by means of the Universal protection that has been granted by Berne Convention. This has helped in materializing an effective protection scheme of the works generated by any means, with the aid and assistance of any commodity from any part of the world so long as the nation state in question is a member state of the Berne Convention.¹

The WIPO Copyright Treaty 1996 (WCT) and the WIPO Performances and Phonograms Treaty 1996 (WPPT) provide a sound protection system of generalized scheme of protection for the work categorized under the copyright and related rights.² In the light of the intellectual property right, the object is to reward the creators and boost inventions. Therefore the requirement of framing a specific and sound system of law recognising the information generated from the satellite in the light of the intellectual property rights regime becomes indispensable in order to ensure effective protection and recognition of all the constituting elements that lie in the interface concerning the Copyright regime and the Outer Space.

¹ Retrieved from https://www.wipo.int/export/sites/www/patent-law/en/developments/pdf/ip_space.pdf, last accessed on August 2, 2023.

² Retrieved from <http://docs.manupatra.in/newslines/articles/Upload/DFC0906E-2C8A-45EF-8553-8604077E1D49.pdf>, last accessed on August 2, 2023.



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