

LAWS RELATING TO PATENT RIGHTS OF PRIVATE PARTIES WITH RESPECT TO OUTER SPACE ACTIVITIES

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Abstract

The recent surge in the generation of intellectual property in space has led to the development of treaties and different legal regimes, along with collaborations and different tie-ups for the purpose of protection of interests in outer space. This has been accompanied with the emergence of the concept of applicability of terrestrial laws on the extended territorial limits in outer space. Of late, there has been widespread privatization of space activities with different private players plunging into the industry in order to reap maximum profits from the ever burgeoning industry. The patent rights and the income earned through the subsequent monopolization is what is acting as an incentive for the private players to undertake such billion-dollar investments. However, despite all this, the absence of a central regime for resolving conflicts arising in the intellectual property right claims in outer space proves to be a major source of risk and uncertainty for such investors. In the paper, the authors attempt to ascertain the position of private parties with respect to the current patent laws and to determine that how such rights act as an incentive for them to plunge into the industry. The authors would also suggest possible new moves that can be undertaken.

1. INTRODUCTION

“There is perhaps no better a demonstration of the folly of human conceits than this distant image of our tiny world” – Carl Sagan⁴⁹¹

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There was an underlying reasoning for the problems experienced by the eminent jurists for what they goaded themselves into understanding the essence of the intangible property as the creative and the mimetic skills⁴⁹² depending upon the mostly silent knowledge which is neither formalized nor spoken.⁴⁹³ Justice Hutcheson⁴⁹⁴ has written very vividly and broadly while discussing about infringement of patents and the difficulty faced in formulating judgments, in the former half of the previous century and the lines are worth quoting without change;

He says that the case must exhibit, “*The same imaginative response to an idea, something of that flash of genius that there is in the inventor, which all great patent judges have had, that intuitive brilliance of the imagination, that luminous quality of mind, that can give back, where there is an invention, an answering flash for flash.*”⁴⁹⁵

Laws have definitely evolved over the decades and the legal landscape has taken a new shape. Today, there are international treaties above the national laws, which heavily influence the framing of these domestic laws. With advances in science and technology, patent regimes around the world have also developed adequately and concurrently. With the extension of possibilities, humans framed laws must be adopted to govern activities in the outer space as well. The idea, through the lines above, was first expressed all the way back in the year 1928 but it holds just as much relevance even today. However, while these lines mention

⁴⁹¹ Carl Sagan, “The Pale Blue Dot image of Earth, taken by Voyager 1 spacecraft, 6 Billion Kilometers away”, *Times Magazine*, 9 January 1995 at p.27

⁴⁹² Brad Sherman and Lionel Bently, *The Making of Modern Intellectual Property Law: The British Experience*, Cambridge University Press, U.K., 2003

⁴⁹³ *Id*

⁴⁹⁴ Justice C. Hutcheson, Jr. was the Chief Judge, Fifth Circuit Court of Appeals, He has authored several judgments and articles in relation to the then existing patent laws of the United States of America.

⁴⁹⁵ Justice Hutcheson, “The Judgment Intuitive: The Function of the ‘Hunch’ in Judicial Decision”, *Cornell Law Quarterly*, Vol. 16, 1928, pp. 284.

the ‘inventor’, the phrases in the above expression which must acknowledge the ‘investor’ are conspicuous in their absence.

The principle premise which governs outer space activities is that they shall be carried out in such a way that the use of outer space by all the nations can be done on a peaceable basis⁴⁹⁶ and appropriation is highly discouraged. Thence, the usage cannot be limited. In light of the tremendous growth in the commercial activities in space,⁴⁹⁷ which include ventures involving investments worth billions of dollars, it becomes pertinent to protect the fruits of such activities through the means of intellectual property laws. It is a rather intriguing question – **“How can the exclusive rights enjoyed by an inventor exist in consonance with the benefit clause of the outer space treaty or the non-appropriation principle?”** Its deliberation would ideally incorporate debate over the freedom to utilize outer space and the expectations of the public and the ever-burgeoning space industry. With the increasing privatization of space activities which include anything from remote sensing using satellites to manufacturing under micro-gravity conditions, for example Inmarsat and Intelsat⁴⁹⁸, the consciousness and recognition of property owned by private parties, in both tangible as well as intangible form, has been on the rise. Taking into consideration the financial might required for such projects to take shape, the concept of collaboration between state-owned space agencies and private players is not unheard of anymore. The only incentive for private entities to continue financing such efforts is a clear cut expectation of recovery of profits from their investments in the arena of research and development for such mammoth projects. The right of private parties to ownership and security of intellectual property thus created through patent protection would betoken an optimistic return and would encourage their continued participation.

⁴⁹⁶ Craig Mackey, “The Celestial Security Dilemma: The United States, the People’s Republic of China, and the Militarization of Outer Space”, *Journal of International Service*, Vol. 21, November 2 2012, pp. 5.

⁴⁹⁷ Martin Menter and T. Stephen Cheston, “Space Stations and Habitats, Proceedings of the Annual Meeting”, *American Society of International Law*, Vol.72, 1978, pp.268-288

⁴⁹⁸ Privatization of INTELSAT, *The American Journal of International Law*, Volume 95, No. 4 (2001), pp. 893-95

The *status quo* in the field of patent laws in the outer space domain is a portrait of disarray and complexity and absent a reliable legal framework. As soon as an inter-territorial dispute arises, different national laws are deemed to govern the questions which clearly belong in an international jurisdiction, and which must be resolved through application of clearly defined international legislation pertaining to intellectual property rights. The presence of a proper legal framework would have a direct bearing upon the assurance of a fair and competitive environment when it comes to encouraging investment by private parties. The current situation, however, is such that answering questions pertaining to patent ownership rights over the inventions made or sold in outer space is akin to following the “white rabbit down the rabbit hole”, meaning thereby, that one question only leads us towards another inquiry without getting any conclusive answers.⁴⁹⁹

The growing rivalry amongst giants like Boeing, Sierra Nevada, Orbital Science and Bigelow Aerospace for the development of commercial space vehicles for operation in the Low Earth Orbit (LEO) has kindled the need to have settled laws pertaining to patent infringement in outer space. In order to obtain legal protection, the inventing party must stand in fulfillment of the legal requirements in the relevant jurisdiction, and those interested in obtaining patent rights across nations must file an application under the International Patent Cooperation Treaty. This is the extant understanding of terrestrial patent law.

As per the Outer Space Treaty and the Registration Conventions, the signatory states or the launching states could extend their national laws, which would include their respective patent protection regimes, to the registered objects in space. But there is no provision defining the position of the private parties with respect to such treaties and the power to control and enjoy their intellectual property rights, thereby rendering these questions ambiguous. The authors have attempted to substantiate the need for establishment of an international body

⁴⁹⁹ Theodore U. Ro, Matthew J. Kleiman and Kurt G. Hammerle, Patent Infringement in Outer Space in Light of 35 U.S.C. § 105 following the white rabbit down the rabbit loophole, *Journal of Science & Technology Law*, Volume 17 Issue 2, 2011, p. 202

governing issues pertaining to violation of patent rights in outer space and the position of private parties with respect to such international body.

2. PRINCIPLES GOVERNING THE OUTER SPACE AND PATENT LAWS AT CROSS ROADS

A careful look at the provisions of the outer space treaty makes it evident that the drafters of the treaty never took into consideration the possibility that space activities would be dominated in the future by private giants and not solely by State owned entities. Under Part A⁵⁰⁰ of the Outer Space Treaty⁵⁰¹ it has been very explicitly mentioned that the treaty was signed by the nations who were motivated by the “great prospects” which would ultimately benefit mankind. There was no intent to focus on the benefits which may be derived by the signatory states, or the private parties.⁵⁰² General neutrality was ushered in through the treaty.⁵⁰³ Neither would a single State derive benefit at the cost of others nor would the private parties be able to lobby and extract benefits from the internationally governing clauses.⁵⁰⁴

The current patent law principles suggest that the local regimes for patents are enforceable only within the territorial boundaries of the nations.⁵⁰⁵ Similar to the concept of high seas, outer space does not fall

⁵⁰⁰ Part A, Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including Moon and Other Celestial Bodies (1967), “*Inspired by the great prospects opening up before mankind as a result of man’s entry into outer space*” available at <http://history.nasa.gov/1967treaty.html> (Last accessed 25 March 2014).

⁵⁰¹ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including Moon and Other Celestial Bodies (1967) [Hereinafter referred to as Outer Space Treaty] ⁵⁰¹ *Id.*

⁵⁰² *Id.*

⁵⁰³ Robert W. Jarman, *The Law of Neutrality in Outer Space, Institute of Air and Space Law*, McGill University, Canada, 2008.

⁵⁰⁴ *Id.*

⁵⁰⁵ *Patents and Space – Related Inventions*, available at,

under the jurisdiction of any particular nation, thus there cannot be any appropriation of any resource available in outer space nor can any claim lie for such appropriation.⁵⁰⁶ Thus, it stands free for exploration and utilization by all the States or nations. This is in direct continuation of the golden lines laid down in the international treaties. In the enunciated basic framework on international space law in the Outer Space Treaty, clear guidelines have been laid down with regard to the usage of celestial bodies for the purpose of research, while ensuring harmony between states and thereby reducing conflicts with respect to exploration activities, since no sovereign authority could claim to own a particular object in its entirety.⁵⁰⁷

In reference to the applicability of national patent laws, there are problems which inevitably arise with regard to their extension to extra-territorial domains, in this case outer space. However, the interests of the states need to be protected. It is clearly mentioned in the Outer Space treaty: *“The State on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and any personnel thereon, while in outer space.”*⁵⁰⁸

Thus, as an obvious corollary of the above, the patent laws of the respective state are also applicable on the object released in outer space. The sole requirement is that such laws be made enforceable for the particular objects coming under the jurisdiction of the respective state by way of Treaty or convention.⁵⁰⁹

http://www.esa.int/About_Us/Industry/Intellectual_Property_Rights/Patents_and_space-related_inventions (Last accessed 13 March 2014)

⁵⁰⁶Outer Space Treaty, 1967, Article 2 *“Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.”*

⁵⁰⁷ *Ibid*

⁵⁰⁸ Outer Space Treaty, 1967, Principle 7, Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space,

⁵⁰⁹ *Ibid*

For example, the USA Patent Act ⁵¹⁰which states that any invention made, used or even sold in outer space while aboard the space craft or any object that has been released by it into space would fall under the jurisdiction of USA since it would be considered as sold, invented or used on Earth within the territorial limits of USA. The only other country to have taken such a step is Germany who, prior to the signing of intergovernmental agreement (IGA)⁵¹¹, extended its patent laws to objects in space which are owned by it. But this is the case, where a country has individually taken initiative.

In the case of the ISS, it is extremely difficult to determine the applicable legal regime since it is a collaborative effort and each and every part is contributed by a different partner, with each having ownership rights over them and thus, claiming jurisdiction over them.⁵¹² Technically speaking, the ISS is just an assembly of separate parts owned by different nations instead of being an international space station per se.⁵¹³

2.1. GROWTH OF PRIVATE PARTY INVESTMENTS IN OUTER SPACE

⁵¹⁰*Inventions in outer space*, 35 U.S.C. § 105 (2003), available at <http://www.bitlaw.com/source/35usc/105.html> (Last accessed 25 March 2014).

⁵¹¹ The Intergovernmental Agreement establishes the International Space Station cooperative framework. This has been signed and ratified by fourteen nations which include the United States (European Space Agency), available at http://www.esa.int/Our_Activities/Human_Spaceflight/International_Space_Station/International_Space_Station_legal_framework (Last accessed 25 March 2014)

⁵¹² *International Space Station Legal Framework, ESA*, available at, http://www.esa.int/Our_Activities/Human_Spaceflight/International_Space_Station/International_Space_Station_legal_framework (Last accessed 25 March 2014)

⁵¹³ *Patents and Space – Related Inventions*, available at, http://www.esa.int/About_Us/Industry/Intellectual_Property_Rights/Patents_and_space-related_inventions (Last accessed 23 March 2014)

It was the government of the United States which sponsored the first ever human landing on the lunar surface. The spacecraft named Apollo 11, was developed and launched by NASA, a US governmental establishment. The landing took place in 1969, which marked a historic leap in the growth of human activities in outer space. However, it wasn't until the passionate multi-billionaire Dennis Anthony Tito, who spent nearly six days in orbit as the crew member of the ISS EP-1(Soyuz TM-32) in the mid of 2001 photographing the Earth and listening to opera,⁵¹⁴ that the trend of private forays into space began gathering pace. Tito's vacation at the ISS came across as the perfect example of a viable business opportunity for private players in space.⁵¹⁵ A year later a South African named Mark Shuttleworth returned from the ISS after conducting extensive research and expressed his urge to become a frequent visitor in space. Soon after this, the X Prize Foundation came into existence with an initiative to offer monetary prizes in order to boost private investment in space adventures, aimed at spurring innovation in the guise of a competition. Rutan was the sole person responsible for designing Space Ship One, which went on to be the first privately built vehicle to be able to safely carry a pilot and two passengers of equivalent weight. Rutan accomplished this feat not only to win the Ansari X Prize of ten million dollars⁵¹⁶ but also to

⁵¹⁴ John Adolph, The Recent Boom in Private Space Development and the Necessity of an International Framework Embracing Private Property Rights to Encourage Investment, *International Lawyer*, Volume 40, No.4, (2006), pp. 961-985, available at <https://law.wustl.edu/Library/CILP/2007/cilp0413jour.html> 1226857348846 (Last accessed 17 March, 2014).

⁵¹⁵ Nicole Lenoir-Jourdan, "Watch this Space, Executive Living" (2014), available at <http://www.theaustralian.com.au/executive-living/watch-this-space/story-e6frg9zo-1226857348846> (Last accessed 17 March 2014).

⁵¹⁶ Leonard David, "Space Ship One wins \$10 million Ansari X Prize" (2004) available at <http://www.space.com/403-spaceshipone-wins-10-million-ansari-prize-historic-2nd-trip-space.html> (Last accessed 17 March 2014)

testify to the fact that the fields of space tourism and other space activities were ripe for entrepreneurs to step into.⁵¹⁷

The first successfully built space corporation is Virgin Galactic. The company has set itself a simple and coherent goal which involves constructing a space port, creating a space transport agency and enjoying the benefits arising thereof.⁵¹⁸ Serial entrepreneur Elon Musk's venture Space X, aims at planting satellites, either owned by private corporations or by the nations themselves, into the Lower Earth Orbit (LEO) and is even working upon an ambitious project of ferrying people to and from space.⁵¹⁹

The COMSAT was created by the enactment of a law⁵²⁰ in the year 1962 by the government of the United States. This was a venture between the private parties and the government itself. The UN General Assembly soon passed a resolution to the effect that the communication satellites and their facilities should be made available to all the nations as soon as it was practicable without any discrimination.⁵²¹ Similarly, in 1964, INTELSAT was formed. In this the power of governance held by each contributor depended upon the capital contributions which were made by that entity, whether private or public.⁵²² By the beginning of the new millennium, INTELSAT had almost 140 member states.⁵²³ This grew to such an extent, that competitors in the communication business began criticizing the perks enjoyed by an international organization like INTELSAT, which even

⁵¹⁷ *Id*

⁵¹⁸ Privatization of Space Industry: Changing of the Guard, TalkTank, available at <http://talktank.wordpress.com/2011/01/13/privatization-of-the-space-industry-changing-of-the-guard/> (Last accessed 17 March 2014)

⁵¹⁹ *Id*

⁵²⁰ *Communications Satellite Act*, 1969

⁵²¹ General Assembly Resolution 1721, UN GAOR, Session 16, Supp. No. 17, UN Doc. A/5100 (1962)

⁵²² Privatization of INTELSAT, *The American Journal of International Law*, Volume 95, No. 4 (2001), pp. 893-95

⁵²³ *Id*

made it immune to antitrust and tax regulations. COMSAT enjoyed the same benefits but was subsequently acquired by the private aeronautics giant, Lockheed Martin in 1999.⁵²⁴ A similar fate was inevitable for INTELSAT. President Clinton, the then President of the United States, enacted a new law abbreviated ORBIT which went on to provide for the privatization of the INTELSAT by the year 2001. All the assets and the liabilities were transferred to the Bermuda based holding company, known as Intelsat Ltd. All the operating licenses were to be held by the US Licensee, Intelsat LLC and a Delaware Incorporated subsidiary. Thus the great INTELSAT was completely privatized.

While the privatization of space activities has progressed astonishingly fast in the past few decades, there arises a very vital question as to what is the incentive, apart from the bare profits earned by private entities, to keep them active in the field of space exploration? While profit plays a major role in motivating private players who invest billions of dollars into such exploratory and research activities, the protection of their rights over the inventions that are given birth to through such research activities is the need of the hour.⁵²⁵

2.2. NEED FOR A PATENT REGIME IN OUTER SPACE: ADDRESSING THE INCENTIVE GAP

It is pertinent to ask “why is there the need to have a proper or well-defined patent regime in outer space?” The answer to this question is incidentally the same as one of the reasons for implementing a patent regime in individual nations on earth – to provide an incentive for investment of time and effort.

⁵²⁴ Lockheed Martin completes Acquisition of COMSAT Corporation, *Space and tech Flash* (2000), available at <http://www.spaceandtech.com/digest/sd2000-21/sd2000-21-005.shtml> (Last accessed 17 March 2014)

⁵²⁵ *Id*

The American High Powered Steering committee considered the possibility of space colonization and formulated a resolution⁵²⁶ wherein of the two chief issues which were intricately built from the presentation of the document the first was that which theory of natural law and the values inculcated in the United States Constitution, would be made applicable on the outer space activities. The second essential question raised was that had the technology being used for such exceptional survival deeply embedded with such values or theories.⁵²⁷ The main crux of the debate was that in whichever corner of the universe a human resides, he could not be deprived of his natural rights.⁵²⁸ A Constitution for the same was framed over a period of time, and with the gradual increase in understanding about life in such extra-terrestrial conditions and with the advancement of technology. In the same document it was stated:

*“Recognizing the responsibility of a government to protect the rights of the governed to exist and to evolve”*⁵²⁹

There was unanimous acceptance of the principle that even though such station would survive only with the support of earth, the humans residing there should be given space to evolve culturally under such conditions.⁵³⁰ In the discussion, it became very evident, that the framers had foreseen life aboard the space stations.⁵³¹ Thus the targeted problems to be faced by the governing authorities would include the protection of fragile human lives, which would be altogether alien to

⁵²⁶ George S. Robinson, “Re-Examining our Constitutional Heritage: A Declaration of First Principles for the Governance of Outer Space Societies”, *Berkeley Technology Law Journal*, Vol. 3, 1988, pp. 81.

⁵²⁷ *Id*

⁵²⁸ Kurt Anderson Baca, “Property Rights in Outer Space”, *Journal of Air Law and Competition*, Vol. 58, 1992, pp.1041

⁵²⁹ George S. Robinson, “Re-Examining our Constitutional Heritage: A Declaration of First Principles for the Governance of Outer Space Societies”, *Berkeley Technology Law Journal*, Vol. 3, 1988, pp. 81.

⁵³⁰ *Id*

⁵³¹ D Baker, “*Scientific American Inventions from Outer Space: Everyday uses for NASA Technology, 2000*”, available at, <http://ntrs.nasa.gov> (Last accessed 13 March 2014)

such conditions and to safeguard the imminent technological evolution.⁵³² Thus the bigger picture had already been envisioned by these legendary thinkers who committed themselves towards framing of such a document.

Going by the Article I.C of the document, certain fundamental rights could be deemed to have been considered essential. One was the “right to travel to, in and from outer space”.⁵³³ This right was granted to individuals and corporate entities were also included within its ambit. The same document went on to grant the right to ownership of private property. The main reason for granting the latter right was to ensure the setting of a social contract⁵³⁴ and to not let natural rights be overshadowed by governmental pressure.⁵³⁵

The thing to remember at this point is that international law related to outer space activities lays great emphasis on access to the resources available in the outer space without any discrimination whatsoever between nations, which clearly shows the equality of all nations irrespective of their sovereignty on Earth.⁵³⁶ However, while the current laws advocate equality between nations, they exclude private parties per se. As per the conclusion drawn above regarding natural law and the setting of a social contract, even the private entities must be entitled to equal access to space resources. The main reason for advocating such a point for the corporate entities is the sheer volume of investment.⁵³⁷ Each private entity or the privately owned

⁵³² George S. Robinson, “Re-Examining our Constitutional Heritage: A Declaration of First Principles for the Governance of Outer Space Societies”, *Berkeley Technology Law Journal*, Vol. 3, 1988, pp. 81.

⁵³³ George S. Robinson, “Re-Examining our Constitutional Heritage: A Declaration of First Principles for the Governance of Outer Space Societies”, *Berkeley Technology Law Journal*, Vol. 3, 1988, pp. 81.

⁵³⁴ *Id*

⁵³⁵ *Id*

⁵³⁶ Henri A. Wassen Bergh, *Principles of Outer Space Law in Hindsight*, Martinus Nijhoff Publishers, 1991.

⁵³⁷ Edwin W. Paxson, “Sharing the Benefits of Outer Space Exploration: Space Law and Economic Development”, *Michigan Journal of International Law*, Vol. 14, 1992, pp. 487.

corporations invest millions of dollars each year in the maintenance and upkeep of the instruments floating in space on their own accord.

It can be gleaned from the statistics that United States has spent approximately \$16 billion over space activities. Considering that it is a super power and not just another fish in the kettle, this figure can be used to throw into contrast the budgets of other developing or developed nations for space activities. Switzerland spent \$10 million, Mexico spent \$8.34 million and even Pakistan spent \$75.1 million over space exploration and other activities in 2012. Comparing this to the project value of Soyuz TM-32 craft, which was valued to approximately \$ 20 million in the year 2001 and then corrected for inflation in 2012 to \$36 million, it can be said that private parties have enough potential to make investments, both for recreation or for diligent research, equivalent to that of a State party.⁵³⁸

What is the degree of protection available to such private investors and inventors who put in their sweat and blood into the activities conducted by them in outer space? The applicability of the terrestrial laws of patent, which protects the counterfeiting of an invention and prevents stealing and unjust enrichment, on such extra terrestrial beings, projects one ray of hope.⁵³⁹ Interestingly, patent laws by its very nature advocate the existence, importance and priority of private rights over public access.⁵⁴⁰ As stated earlier, once territorial limits are extended to the objects owned in outer space, the national patent laws are also applicable on that object. However, this has not been

⁵³⁸ The data and figures have been retrieved from the archives maintained by the respective nations on their web pages reflecting space activities and the budgetary allocation, available at http://en.wikipedia.org/wiki/International_Space_Station_program (Last accessed 17 March 2014)

⁵³⁹ Bin Cheng, "The Legal Status of Outer Space and Relevant Issues: Delimitation of Outer Space and Definition of Peaceful Use", *Journal of Space Law*, Vol. 11, December 1983, pp. 89.

⁵⁴⁰ Lee Ann W. Lockridge, "Comment: Intellectual Property in Outer Space: International Law, National Jurisdiction, and Exclusive Rights in Geospatial Data and Databases", *Journal of Space Law*, Vol. 32, No.2, (2006), pp. 319.

mentioned explicitly anywhere in any treaty and is an understanding solely based on existing principles. Moreover, upon perusal of the TRIPS agreement, which took over from the Paris and the Berne Convention in the field of international governance of Intellectual Property Rights, it must be noted that there has been no mention of any clause relating to patent in outer space.⁵⁴¹

Article 19 of the Intergovernmental Agreement (IGA) states that each partner of the ISS is bound to share all the technical expertise and share it with all the partners, as long as such sharing is not in contravention to the national laws of the that particular transferring state. However, Article 16 of the same agreement goes on to say that a cross waiver of liability shall not be made applicable in cases involving the infringement of intellectual property rights and such other claims.⁵⁴² Thus, patent infringement claims are available as per the national laws which are applicable by the virtue of extension of national jurisdictions to space. Article 21 of the agreement covers all activities, inventions and infringement of such inventions. In clause 2, it is stated that all activities occurring in any part of the space station shall be deemed to have occurred in the territory of the State under which that part falls.⁵⁴³ Clause 3 of the same article covers all inventions and provides for applicability of the respective national laws with respect to the inventions made aboard that part of the station which is under that respective nation.⁵⁴⁴ This was with respect to nations and the protection of the intellectual property rights of the State or the nation signatory to the treaty. Keeping in mind the current position of the private parties and their capabilities, what if a private entity prefers to join as a partner in the ISS by investing billions of dollars towards development in space? All the current treaties and conventions, fail to even anticipate such a scenario. The document drafted way back in the year 1985, had incorporated the possibility of

⁵⁴¹ *Id*

⁵⁴² Space Station, Agreement between the United States of America and Other Governments 1998, Article 16(3)(d)(4)

⁵⁴³ Space Station, Agreement between the United States of America and Other Governments 1998 Article 21(2)

⁵⁴⁴ *Id*

both technological development and the advent of private parties into the fray.

As noted before in a previous chapter, there has been a rapid rise in private activities in the space. There have been huge investments involving billions of dollars by various giants in the field of communications satellites and aero-dynamics and the aforementioned provisions do not apply to such private parties.⁵⁴⁵ It is very much clear that such actions involve operation of such assets which can have serious repercussions in the economies of both the business as well as the respective nations which they belong to.⁵⁴⁶ Access to space till now was controlled by the governments of several advanced nations. However, there is a real possibility, that with the increased privatization, power wielded by private parties in this area will soon surpass national capabilities. Above all, the rampant practice of disinvestment, which is evident from the move on the privatization of INMARSAT and various others, shows that the private parties are potent enough and are in a position to gain special status in an international treaty. The protection of the natural rights of such corporations would be reiterated here as well. What was advocated in the year 1985 is much applicable to this day.

Private sector investments are themselves rather beneficial. The induced competition within the space activities market would lead to maximization of efficiency and also the increased research spending would lead to new inventions and technological advancement.⁵⁴⁷ Thus, there is a need to protect these investments and the inventions made

⁵⁴⁵ Richard Berkeley, "Space Law Versus Space Utilization: The Inhibition of Private Industry in Outer Space", *Wisconsin International Law Journal*, Vol. 15, 1996, pp. 421.

⁵⁴⁶ Irwin M. Pikus, Law and Security in Outer Space: Private Sector Interests, *Journal of Space Law*, Volume 11, No. 1&2, (1983), pp. 111.

⁵⁴⁷ TY S. Twibell, "Space Law: Legal Restraints on Commercialization and Development of Outer Space", *UMKC Law Review*, Vol. 65, 1996, pp. 589.

aboard privately owned objects in space.⁵⁴⁸ The treaties talk about the interests of the nations but do not focus upon the position of private parties and the protection of their interests in this regard.⁵⁴⁹

Now, there would, arise a question on why protecting patents? An associated question along with this would be on what are the social benefits and costs of awarding patent for inventions?⁵⁵⁰ The most plausible theory given to answer both the questions is motivating inventions.⁵⁵¹ The stricter and the clearer the patent regimes are, the better and the finer inventions a country gets.⁵⁵² Any party would yearn for the security of his intellect spent towards the invention and for the prevention of stealing of his idea.⁵⁵³ The main reason for such fear is not being able to exercise monopoly. But weighing it at the scale, it can be said that allowing practice of monopoly for a certain period of time⁵⁵⁴ is very much just and equitable⁵⁵⁵ for newer and simpler life which the society receives as a result of the hard work and investment of one individual. Thus, from the societal perspective it is

⁵⁴⁸ Roy Gibson, “Law and Security in Outer Space: International Regional Role – Focus on the European Space Agency”, *Journal of Space Law*, Volume 11, 1983, pp. 15.

⁵⁴⁹ *Id*

⁵⁵⁰ Roberto Mazzoleni and Richard R. Nelson, “Economic Theories about the Benefits and Cost of Patents”, *Journal of Economic Issues*, Vol. 32, 1998, pp. 1031- 1052.

⁵⁵¹ Roger K. Hoover, “Law and Security in Outer Space from the Viewpoint of Private Industry”, *Journal of Space Law*, Vol. 11, 1983, pp. 115.

⁵⁵² Roberto Mazzoleni and Richard R. Nelson, Economic Theories about the Benefits and Cost of Patents, *Journal of Economic Issues*, Vol. 32, 1998, pp. 1031- 1052.

⁵⁵³ Edward Finch, Jr., “Law and Security in Outer Space: Implications for Private Enterprise”, *Journal of Space Law*, Vol. 11, 1983, pp. 107

⁵⁵⁴ For Example, Indian Patent Laws allow a patent to remain protected for a period of 20 years. After this, the invention enters the public domain and is free to be used by anyone for any purpose. A re-registration or a renewal is barred.

⁵⁵⁵ John F. Duffy, “Rethinking the Prospect Theory of Patents”, *The University of Chicago Law Review*, Vol. 71, 2004, pp. 439-510.

correct and moral to have patent regimes and to allow the strictest implementation of the same.

Outer space cannot be appropriated⁵⁵⁶ and has to be mandatorily used for peaceful purposes.⁵⁵⁷ The State could be held liable for the activities of its private entities. Once a patent issued for the purpose of any invention, the patentee can restrict the rights of other people intending to use such an invention. However, the importance of having a legal regime that protects patent in space activities cannot be overstated. This helps in maintaining monopoly for the private players in order to earn maximum profits in a still nascent industry. The industry has definitely grown at breakneck speed on the national front but for private parties, it is still young. Thus the protection of their interests would act as an incentive for further investment.⁵⁵⁸

The current patent regime also mandates the disclosure of certain non-crucial information.⁵⁵⁹ Moreover, most national IP regimes include research exemptions when it comes to using patented inventions in scientific research and technological advancement. Thus the secret also

⁵⁵⁶ Outer Space Treaty 1967, Article 2 (As referred in⁵⁵⁶ Isabelle Bouvet, *Certain Aspects of Intellectual Property Rights in Outer Space*, McGill University, Montreal (, 1999)) .

⁵⁵⁷Outer Space Treaty 1967 Article 4 (As referred in Isabelle Bouvet, *Certain Aspects of Intellectual Property Rights in Outer Space*, McGill University, Montreal (1999)),⁵⁵⁷ *Id* at pp. 86 “States parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner. The moon and other celestial bodies shall be used by all State Parties to the Treaty exclusively for peaceful purposes.

⁵⁵⁸ Roberto Mazzoleni and Richard R. Nelson, “Economic Theories about the Benefits and Cost of Patents”, *Journal of Economic Issues*, Vol. 32, 1998, pp. 1031- 1052

⁵⁵⁹ Leo B, Malagar, and Marlo Apalisok Magdoza – Malagar, *International Law of Outer Space and the Protection of Intellectual Property Rights*, *Boston University International Law Journal*, VolumeVol. 17, (1999),, pp. 311.

stands protected and the underdeveloped nations also get a fair chance of getting a hand at the technologies⁵⁶⁰ used by both private parties and the other developed nations without even indulging into wasteful infringement acts.⁵⁶¹ Thus the infringement of the patent rights could be the most likely source of conflict. The grounds for selection of appropriate forum, resolution of jurisdictional disputes, and the fixing of appropriate liabilities, seem to be dragging us down the rabbit hole.⁵⁶²

Patent law and space law intersect at the question of protection of an inventor or an investor's rights in an invention or any other activities in outer space involving exercise of his monopoly over use of that invention. All attempts to answer one question just lead to more questions resulting in an unending exercise in uncertainty.⁵⁶³ This question can be answered better with the example of the US Patent Act. The US Patent Act was passed with the very motive of extending the sovereign rights of US over the objects released in space.⁵⁶⁴ Thus any activity or invention taking place aboard would come under the jurisdiction of US and the applicable laws would be of US. However, this is not the case with all the countries. There are several other countries that haven't yet passed any legislation of this breed and there are many more countries that are yet to step into the industry of space exploration. But taking into account the rate of growth and the availability of information, in addition to the limited duration of each patent, after which it enters the public domain, the day is not far when possibly all countries will have their own legislations in this regard and more and more private parties would undertake investments in this

⁵⁶⁰ Leo B. Malagar and Marlo Apalisok Magdoza – Malagar, International Law of Outer Space and the Protection of Intellectual Property Rights, *Boston University International Law Journal*, Vol. 17, 1999, pp. 311.

⁵⁶¹ *Id*

⁵⁶² Theodore U. Ro, Matthew J. Kleiman and Kurt G. Hammerle, Patent Infringement in Outer Space in Light of 35 U.S.C. § 105 following the white rabbit down the rabbit loophole, *Journal of Science & Technology Law*, Vol. 17 Issue 2, 2011, p. 202

⁵⁶³ *Id*

⁵⁶⁴ *IbidId*

industry.⁵⁶⁵ Thus clarity in the intellectual property laws would aid in easy redressal of grievances and quicker resolution of disputes. This would also act as an incentive for the private parties to invest more and to encourage further exploration and invention. The degree of security is ultimately what determines the level of investment, taking any industry into account.⁵⁶⁶

The next question to address is “how many conflicts and difficulties arise while dealing with the protection of intellectual property in outer space, where the property upon which control is deemed to be exercised is actually outside the sovereign territory?” If a company plans to release satellites containing high end technology, it has to register it at a national as well as international level. Further, the state registering it would exercise control over the object so released. In cases of conflict, the laws of the State registering it would apply.⁵⁶⁷ Thus in case of absence of any specific provision relating to patent rights, the law of the State would apply.⁵⁶⁸ This brings to light an inevitable conflict situation between the parties claiming ownership of the patent. A central regime governing the outer space activities and the activities leading to arousal of intellectual property claims would resolve the aforementioned problem and lead to a more uniform regime of dispute settlement.⁵⁶⁹

The only question addressed is that of the determination of patent ownership. This is because all the nations answer this issue on first-to-

⁵⁶⁵ Julie D. Cromer, “How on Earth Terrestrial Laws can Protect Geospatial Data, *Journal of Space Law*”, University of Mississippi School of Law, Vol. 32, 2006, pp. 253.

⁵⁶⁶ Irwin M. Pikus, “Law and Security in Outer Space: Private Sector Interests,” *Journal of Space Law*, Volume Vol. 11, No. 1&2, 1983, pp. 111, available at <http://www.spacelaw.olemiss.edu/jsl/pdfs/back-issues/jsl-11.pdf> (Last accessed 25 March 2014)

⁵⁶⁷ Isabelle Bouvet, *Certain Aspects of Intellectual Property Rights in Outer Space*, McGill University, Montreal, 1999

⁵⁶⁸ Manfred Lachs, *The Law of Outer Space, An Experience in Contemporary Law-Making*, Martinus Nijhoff Publishers, 2010.

⁵⁶⁹ Isabelle Bouvet, *Certain Aspects of Intellectual Property Rights in Outer Space*, McGill University, Montreal, 1999

register basis. However, the question of infringement of patents currently held by a third party or the use of rights in outer space still remains unanswered.⁵⁷⁰

The lack of an international IP law jurisdiction may also lead to exploitation of the weaknesses inherent in a territorial system where IP protection is granted by National Governments, governed by national laws and enforceable within national boundaries.⁵⁷¹ Basing the outer space patent system on the application of national patent laws to registered space objects could limit the effectiveness of patent protection for space technologies.⁵⁷² A patent regime based on national jurisdiction could enable companies to circumvent patents on space technologies by registering their spacecraft in countries where these patents are not on file.⁵⁷³ The common practice of registering ships under “Flags of convenience”⁵⁷⁴ is likely to raise many of the same legal issues in space as it does at sea. However, the unique nature of outer space may further exacerbate these issues, owing to the fact that unlike cargo ships on high seas which have a destination country, in space, there is no destination and therefore the responsibility to enforce patent protection laws upon a private entity would fall upon the country where the spacecraft is registered. If the patent in question is not on file or is difficult to enforce in that country, the patent holder would be virtually powerless to protect his invention.⁵⁷⁵

⁵⁷⁰ *Id*

⁵⁷¹ Christian Brunner, “Alexander Soucek, Outer Space in Society, Politics and Law”, *Studies in Space Policy*, Vol. 8, 2011, pp. 876.

⁵⁷² Manfred Lachs, *The Law of Outer Space, An Experience in Contemporary Law-Making*, Martinus Nijhoff Publishers, 2010.

⁵⁷³ *Id*

⁵⁷⁴ *What are Flags of Convenience?* available at <https://www.itfglobal.org/flags-convenience/sub-page.cfm> (Last accessed 25 March 2014)

⁵⁷⁵ Matthew J. Kleiman, “Patent rights and flags of convenience in outer space”, *The Space Review*, (2011), available at <http://www.thespacereview.com/article/1772/1> (Last accessed 25 March 2014)

In order to provide an incentive for technological advancement, the return on investment must be ensured on the billions of dollars invested by private players.⁵⁷⁶ One example of note here would be that of the company Iridium,⁵⁷⁷ who failed to gain a large share of revenue as returns on the huge investments they made.⁵⁷⁸ As a result, the desired level of commercialization was never reached and the company now stands dissolved after filing for bankruptcy.⁵⁷⁹ While this particular incident is not specifically related with patent infringement claims, according to the authors it is closely linked with the fate which may await any private player which might invest without an assurance of returns on their investment.⁵⁸⁰ Moreover, the infringement of intellectual property rights gives rise to long endless disputes which would adversely affect the business of that company, and ultimately the investments made by them may fail to reap adequate profits.⁵⁸¹

In the absence of a central international patent law regime, such measures would ultimately lead to ensuring of confidentiality of the scientific data through contractual protection since the interests of both the parties are quite important and obvious to mention that they

⁵⁷⁶ Michael Kremer and Heidi Williams, “Incentivizing Innovation: Adding to the Tool Kit”, *Innovation Policy and Economy*, Vol. 10, 2010, pp. 1-17.

⁵⁷⁷ Sydney Finkelstein and Shade H. Sanford, “Learning from Corporate Mistakes: The Rise and Fall of Iridium”, Vol. 29 Issue 2, 2000, pp. 38, available at <http://www.rentcell.com/manuals/Iridium.pdf>

⁵⁷⁸ Michael Kremer and Heidi Williams, “Incentivizing Innovation: Adding to the Tool Kit”, *Innovation Policy and Economy*, Vol. 10, 2010, pp. 1-17.

⁵⁷⁹ Sydney Finkelstein and Shade H. Sanford, “Learning from Corporate Mistakes: The Rise and Fall of Iridium”, Vol. 29 Issue 2, 2000, pp. 38, available at <http://www.rentcell.com/manuals/Iridium.pdf>

⁵⁸⁰ *Id.*

⁵⁸¹ Edwin W. Paxson, “Sharing the Benefits of Outer Space Exploration: Space Law and Economic Development”, *Michigan Journal of International Law*, Vol. 14, 1992, pp. 487.

are completely opposite to each other.⁵⁸² The players in the space industry could be narrowed down to three types, governments, institutions and private parties. These, work in collaboration with each other or they work with each other but the fulfillment of the personal interests remain a common goal.⁵⁸³ In order to prevent the secrets from being divulged, the most common tool would be in the form of a non-disclosure agreement.⁵⁸⁴

An instance of the non-fulfillment of the interests of the private players would be the adoption of a specific legislation by the US Government with respect to technology transfer.⁵⁸⁵ The Department of State overlooks all the international contractual relations being undertaken in the field of such investments, thereby exercising sufficient control over the type of the commercial operation with the intent to assure protection of national technology.⁵⁸⁶ This could develop into a major roadblock in the path to commercialization of satellites since there is a high possibility of governmental influence being too high to sustain private interests.⁵⁸⁷

Above all, granting a separate position to the private parties, and to grant them special rights to be enjoyed would amount all together a new era of formulating legislations governing nations. The statistics and other considerations of natural law, go far enough to persuade and to advocate the position of private parties with respect to outer space laws and activities.

3. CONCLUSION AND SUGGESTIONS

⁵⁸² Isabelle Bouvet, *Certain Aspects of Intellectual Property Rights in Outer Space*, McGill University, Montreal, 1999

⁵⁸³ *Ibid*

⁵⁸⁴ Lesley Jane Smith and Ingo Baumann, *Contracting for Space*, Ashgate Publishing Limited, 2011

⁵⁸⁵ Isabelle Bouvet, *Certain Aspects of Intellectual Property Rights in Outer Space*, McGill University, Montreal, 1999

⁵⁸⁶ *Id*

⁵⁸⁷ *Id*

Furthering the argument made in the last point it can be said that those countries, who are signatories to different treaties but lack domestic laws in this regard, are unable to answer such questions with regard to redressal for infringement. Thus the private parties who would be governed under those laws remain vulnerable. Thus it can be said that the presence of a central legislation or a treaty which governs the activities of every country without the need for every country to formulate extended laws, would be an appropriate move to be taken at this juncture.

Giving the private parties appropriate recognition and giving them such incentives by specific provision in international treaties would ultimately benefit mankind, which was also the motive while formulating the Outer Space Treaty.⁵⁸⁸ The amount of investment made into this is equivalent to investments which are otherwise made by the State for public good or in public interest. Thus if the private entities are entering into such arena, there should be clearly defined laws which are intended to benefit the parties to further invest and grow.

Looking at the current legal landscape it can be said that the question of territoriality or jurisdiction could be easily answered but resolution of conflicts through the introduction of an appropriate intellectual property regime still remains to be addressed with regards to the field of space law. This last point can be supported by the argument that the inventions done in outer space are not comparable to the inventions made on Earth in the sense of amount of investment and also the difference in need to protect such investments.

Additionally, looking at the statistics, it is prima facie evident that private parties have been potent enough to incur expenditure and to allocate funds as equivalently to that of a nation State or any other member country of international treaties.

⁵⁸⁸ Part A, Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including Moon and Other Celestial Bodies (1967), "*Inspired by the great prospects opening up before mankind as a result of man's entry into outer space*", available at <http://history.nasa.gov/1967treaty.html> (Last Visited March 25, 2014)

There are no treaties which explicitly deal with patent rights in outer space. The existence of certain treaties on Earth cannot be said to conclude the positive situation of governance in the outer space with the same set of legislations. It has already been stated in the document filed way back in 1985 by the United States, which went on to promote the idea of separate set of laws for the people and the community living in the Outer Space. The consideration given to this thought was the values they shared and developed in such extra terrestrial conditions would not easily match the legislations of that on Earth. They need separate governance and a set of laws. Thus, the most beneficial conclusion to be drawn here is to have a separate set of treatises concerning patent laws for outer space. This is drawn as an obvious corollary from the master class of legislation for outer space.

Considering the position of private parties and their leviathan nature of activities, it can be said that the position of private parties must first be well defined and the absence of appropriate forum addressed with the introduction of a centralized system to deal with such exceptional issues. The extended laws are applicable to only that country which brings about such an extension, but an international treaty which formulates a universally accepted patent regime in accordance with the international norms and customs must be undertaken. The separate protection to be given to the private entities have been discussed at length in the paper and is very much just and equitable within the meanings of natural law, to have such definitions created. This would ultimately benefit the society, considering the speed at which science is advancing.

“Everything is theoretically impossible, until it is done” – Robert A. Heinlein