



WHITE BLACK LEGAL

LEGAL

VOLUME 1: ISSUE 8

||January 2020 ||

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WHITE BLACK LEGAL is an open access, peer-reviewed and refereed journal provide dedicated to express views on topical legal issues, thereby generating a cross current of ideas on emerging matters. This platform shall also ignite the initiative and desire of young law students to contribute in the field of law. The erudite response of legal luminaries shall be solicited to enable readers to explore challenges that lie before law makers, lawyers and the society at large, in the event of the ever changing social, economic and technological scenario.

With this thought, we hereby present to you

WHITE BLACK LEGAL: THE LAW JOURNAL

PROPERTY RIGHTS ON CELESTIAL BODIES: PRIVATIZATION OF THE MOON

Chaitya Hiremath

ABSTRACT:

Wouldn't it be wonderful to own a piece of land on the moon, develop that property and go there for a long vacation?

Due to technical advancements, going to the moon for vacation is plausible in the near future. However, owning property on such celestial bodies is not legally permissible. But why is it impossible to own a property on the moon? What is the legal reasoning behind this restriction? Is this reasoning justified? And should this restriction continue to be in place? This paper attempts to answer these questions. The current legal standing on property rights on celestial objects like moon is that, it doesn't allow any nation to exercise sovereignty on these bodies as established by THE OUTER SPACE TREATY, 1967.

The progression of space technology has opened new visions of promises with which the humanity shall be benefitted if the technology is regulated in a proper manner. And this technology has indeed been very beneficial. For instance, remote sensing of earth, direct television broadcasting, communication, transportation, meteorology, navigation, weather and climate, etc. However, since outer space has been identified as a "Common Heritage of Mankind" the benefits must be plausible for all the nations. But is it the case? Apart from its potentiality or scientific progress and its economic promises, the use of the outer space has also opened up the new frontiers of differences on the issues of jurisdiction and sovereignty and other related issues like delimitation of outer space, and space pollution, etc.

RESEARCH QUESTIONS:

1. Whether private exploration of space should be allowed? Whether it is beneficial; technologically, economically and legal view.
2. Will providing property rights on celestial bodies such as the moon will benefit the nations?
3. If it does, what is the current status about space exploration and what changes must be incorporated?

INTRODUCTION:

The exploration of space presents a new vision of the universe. It is associated with the new values whose impact on civilization is yet to be measured adequately. Space break-through represents, moreover, a great industrial revolution. To some pioneers like J.R.D. Tata, it symbolises “the dazzling tempo of technological progress...the wonders of its conquest of space and time” which satisfies the inner restlessness of human souls.¹ But to others it is not just a ray of sunshine but a challenge. As president Kennedy put it, the question is not what we can do but what space can do for us.² The new technological revolution, he said should not increase the gap between the poor and the rich, since, “if a free society cannot help the many who are poor, it cannot save the few who are rich.” It is, however, the great tempo generated by the break-through, the rapidity of the events, the shrinking of the time factor which has given an impetus to contemporary international affairs and put on them the stamp of the Space Age. Moreover, apart from adventure and the urge for economic prosperity, it is a quest for knowledge that beckoned man to regions of outer space rather than commerce which drew Christopher Columbus to the new world.

Dealing with the nature and scope of work in such exploration, we proceed to the legal controls of outer space including the moon and other celestial bodies. Legal controls here do not imply any system of government but the process of the development and establishment of a system of law and order in outer space achieved during the decade from 1957 to the signing of the Space Treaty. The present work, by and large, provides a legal commentary on that treaty and other similar treaties, and on the customary developments leading to those treaties. It is not speculative. It only attempts to lay down the *de lege lata*- what the law is.

Any work on space law in its formative stage is bound to be both extensive and intensive as it involves problems of sovereignty, jurisdiction, territory, nationality, relationship between states and other international entities, unification of private laws and many problems of conflict of law. Presently, in this era, we require a stable legal framework to incentivise responsible exploration and potential resource exploitation from these celestial bodies³. There is a great potential in commercializing the resources in celestial bodies. However, due to

¹ Speech delivered on All India Radio on the occasion of the thirty-fifth anniversary of Air India as reported on 16th October 1967 in *Hindustan Times*.

² *The Space Revolution: A New Perspective* (New York, N.Y., 1962)

³ Sarah Coffey, ‘*Establishing a Legal Framework for Property Rights to Natural Resources in Outer Space*’ *CASE WESTERN RESERVE JOURNAL OF INTERNATIONAL LAW*, VOL. 41, ISSUE 1, 2009
<https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=1238&context=jil>

absence of a stable framework or regulations, the nations and private enterprises are unwilling to risk it and invest in these projects.

Beginning with my first question, the start-point of a legal framework for space laws, “*Whether private exploration of space should be allowed?*”

Space contains valuable resources. These provide a compelling reason for entrepreneurs, investors, and governments to pursue space exploration and settlement. Asteroids are known to be rich in valuable elements like neodymium, scandium, yttrium, iridium, platinum, and palladium, most of which are rare on Earth. Because of the high price that these minerals command, harvesting them from space could possibly justify even very costly mining expeditions. Microsoft billionaire Naveen Jain has founded the company MOON EXPRESS, with plans to use robots to start mining the Moon — as early as next year, it claims.

Meanwhile, Texas-based Shackleton Energy Company plans to mine ice in Shackleton Crater at the lunar south pole to provide propellant for planetary missions and is raising funds for the venture now.

Despite the progress in technology, and the appeal of valuable resources, space settlement has been hampered by the lack of a clearly defined legal regime for recognizing property rights in space international law. There is in fact some slight internationally recognized legal precedent for retaining ownership of resources mined in space, as lunar samples returned to Earth on both U.S. and Soviet missions have been exchanged for other tokens of value. But actually, owning the portion of the celestial body from which the resources are harvested — as in a traditional mining claim — is more problematic. Without legally recognized rights to buy, own, and sell titled property, it is difficult if not impossible to raise capital to develop land or extract the resources it holds. Property rights have long been considered one of the pillars of prosperity in the modern world, and their absence in space — due to the contingencies of the history of international law during the early space age — partly explains why we have not yet developed that final frontier.

International Space Law

International space law, such as it is, began to take shape during the space race, when outer space was viewed not as a potential frontier for development and settlement by private actors but rather as a competitive battlefield between the two superpowers in the Cold War, as well as a new realm for scientific discovery, led by government space agencies. The United States and the Soviet Union each sought to curtail the other’s political and military use of space;

they found common ground, or at least claimed to, in the project of exploring space for the advancement of science.

An important precedent for the development of international space law was the 1959 Antarctic Treaty, which was meant to prevent the militarization of the Antarctic and to ensure that peaceful activities, particularly scientific exploration, be allowed to continue there. These were just the sort of aims that world leaders at the time were concerned with achieving through an international agreement governing space activities, and on September 22, 1960, President Eisenhower recommended that the principles of the Antarctic Treaty be used as a model for an international agreement governing space. But tellingly, because the Antarctic Treaty prevented any nations from establishing sovereignty and contained no provisions for granting property rights or regulating economic activity, resources in the Antarctic have gone undeveloped to this day. This stands in contrast to the emerging resource boom in the equally inhospitable regions of the Arctic, where much clearer property rights exist under the jurisdiction of Arctic nations.

OUTER SPACE TREATY

Negotiations in the late 1950s and early 1960s between the United States and the Soviet Union on governing space activities culminated in the signing in 1967 of the *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies* (better known as the **Outer Space Treaty**, or *OST*), an international agreement that remains the most important piece of international space law today. Just as the Antarctic Treaty was meant to preserve Antarctica as a place for international scientific cooperation, space-law historian Vladimír Kopal writes that agreement on the OST was guided by the principles that “outer space and celestial bodies are free for exploration,” and that they remain free from “national appropriation.”

By permitting non-governmental activities in space, albeit under government supervision, this section of the treaty allowed for the creation of the commercial telecommunications, remote-sensing, and spacecraft launching industries, which were then in their infancy and today are thriving. However, as Kopal notes, the treaty “does not contain any principles that would regulate economic activities for the purpose of exploring and exploiting the natural resources of outer space, the Moon and other celestial bodies.” At the time the treaty was negotiated, the issues of economic development in space seemed remote, and so diplomats set them aside as potential obstacles to finding agreement on what they saw as more pressing issues.

THE MOON TREATY

A dozen years after the signing of the Outer Space Treaty, a handful of countries proposed a new treaty aimed at governing economic activities in space: *The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*. (Its informal name, *the Moon Treaty*, is somewhat misleading, since the treaty applies to all celestial bodies in the solar system, not just the Moon.) The principle behind this treaty is that resources falling outside the territories of nation-states — in this case, off-Earth resources — are “the common heritage of mankind.” This principle is modelled on the 1982 Law of the Sea Treaty, one of the aims of which is to regulate seabed mining. But as a 2009 *Economist* article argued, the Law of the Sea Treaty would deny most of the rewards of prospecting to those who actually undertake it, making it a barrier to seabed mining happening at all: “Commercial miners want both a clear title to their holding and exclusive rights to exploit it. They also have to answer to shareholders.” This is one of the principal reasons that the U.S. Senate has never approved the Law of the Sea Treaty despite repeated efforts to muster the necessary two-thirds vote, most recently in summer 2012.

Fortunately, the Moon Treaty is essentially a failed piece of international law. Only fourteen states are signatories to the agreement, and none of these is a spacefaring nation. Nonetheless, the provisions of the Moon Treaty remain a potential disincentive to the economic development of space and the case for the United States to repudiate it by providing an alternative, more market-friendly legal approach to space settlement.

Unlike the Moon Treaty, all spacefaring nations are signatories of the Outer Space Treaty. But there remains a question of how property rights stand under the OST — whether they are permitted, outlawed, or neither. This issue has not been put to the test in any significant legal proceedings, but some analysts have argued that recognizing property claims would be explicitly prohibited under Article II of the treaty, which reads in part, “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.” It is certainly clear that this part of the treaty prohibits *nations* from making claims of sovereignty off-planet; but whether private property claims are national appropriations depends on whether the recognition of these claims can be considered one of the “any other means” of national appropriation.⁴

A later section of the OST can be interpreted to suggest that private property might count as national appropriation. As noted earlier, under Article VI, signatory states bear

⁴Martin Braddock, Why space colonization will be fully automated, <https://doi.org/10.1016/j.techfore.2019.03.021>

“responsibility for national activities in outer space” no matter whether those activities are conducted by government personnel or private citizens. But it is still not clear that the “national activities” referred to here would include private activities and property claims not made on behalf of a national government. As early as 1969, the distinguished space-law scholar Stephen Gorove argued in the *Fordham Law Review* that the Treaty in its present form appears to contain no prohibition regarding individual appropriation or acquisition by a private association or an international organization, even if other than the United Nations.⁵ Thus, at present, an individual acting on his own behalf or on behalf of another individual or a private association or an international organization could lawfully appropriate any part of outer space, including the moon and other celestial bodies.

In a way, the very existence of the Moon Treaty (notwithstanding its paucity of ratifying states) undermines the notion that the Outer Space Treaty outlaws private property in space — for if it did, there would then have been no need for the Moon Treaty to outlaw it explicitly. At best, as Gorove argued, this is one among several issues that the OST leaves unclear.

Despite these ambiguities, an alternative property-rights regime would be most successful if it aimed to conform with the OST. After all, the OST is the basis of most current international space law, including subsequent treaties, such as *the Rescue Agreement (1968)*, relating to astronaut rescue and return, and *the Liability Convention (1972)*, which establishes how to adjudicate claims for incidents that result in harm to third parties. Hence the first step in any space settlement strategy is to find a means of establishing property rights in space that adheres to at least the letter of the Outer Space Treaty, and perhaps can be considered an attempt to clarify and expand upon it — rather than to engage in the much more difficult process of amending the treaty or negotiating a replacement.

Considering the premise as mentioned before, we now make an attempt to answer the second research question. *Will providing property rights on celestial bodies such as the moon will benefit the nations?* This deals with the economical, legal and technical analysis of the arrangement where such property rights are provided and study the effect or impact it have on nations in different levels and also the global economy.

Current Contentions and Claims

⁵Stephen Gorove, *Interpreting Article II of the Outer Space Treaty*, 37 *Fordham L. Rev.* 349 (1969). Available at: <https://ir.lawnet.fordham.edu/flr/vol37/iss3/2>

Those opposed to the recognition by national governments of property rights in space generally tend to make two assumptions: first, that a national government would only recognize the claims of its own legal persons (that is, citizens of, residents of, and corporations chartered in that nation); and second, that it would defend those claims by force. The former argument has been made by, among others, space-law analyst Leslie I. Tennen, who argued that the decision by a state to recognize property claims “would constitute a *de facto* exclusion of other states and their nationals, and thereby constitute a form of national appropriation.”⁶ Under these assumptions, the recognition of property rights in space could lead to international conflict, which would certainly violate the spirit of the Outer Space Treaty.

But what if governments recognized the property claims of *any* individual or corporation which met specified conditions, regardless of citizenship or nationality? And what if governments did not promise to provide physical defence for these property claims? Under these circumstances, the argument that recognizing property rights counts as *de facto* national appropriation would be on much shakier legal ground. How, after all, could recognition of the property rights of the citizens or corporations of *other* nations count as acts of national appropriation?

The Space Settlement Institute, a New York-based advocacy group, has taken just such an approach in proposed legislation it calls the Space Settlement Prize Act, which, if passed by Congress, would require the U.S. government to recognize and legally support land ownership claims “for any private entity which has, in fact, established a permanently inhabited settlement on the Moon, Mars, or an asteroid, with regular transportation between the settlement and the Earth open to any paying passenger.” The act explicitly defines a “private entity” as “a company, a consortium of companies, and/or one or more individuals that are not controlled by any sovereign state or government.”

This regime would seem to resolve the sticky issue of the Outer Space Treaty’s prohibition of “national appropriation.” For example, a corporation based in Canada could start and inhabit a settlement on the Moon without either the Canadian government or the corporation making an explicit property claim — but the U.S. government could say that *it* recognizes the corporation as having valid property rights in the lunar land that it settled. Under this arrangement, neither the Canadian government nor the U.S. government could be said to be violating the prohibition of national appropriation.⁷

⁶Frans G von der Dunk, *Billion-dollar questions? Legal aspects of commercial space activities*, UNIFORM LAW REVIEW, VOLUME 23, ISSUE 2, June 2018, Pages 418–446, <https://doi.org/10.1093/ulr/uny022>

⁷*ibid*

The privately held space settlements envisioned by the proposed Space Settlement Prize Act would not be under the sovereign jurisdiction of any terrestrial nation (although the individual citizens would still be subject to the laws of their own nations). The corporations who own these settlements would be able to pass local laws, and could, in theory, apply for U.N. recognition and become an extra-terrestrial nation-state capable of granting citizenship to its residents.

More importantly, this legal regime would offer needed assurance that private property rights could be secured by those who undertake the high costs of space exploration and settlement — but it would set the bar high enough to permit only serious property claims. While the proposed act, if adopted by the United States and other governments, would not permit any country to discriminate against the property claims of individuals or corporations from other countries, it also would impose certain obligations on property holders to ensure that they did not act in an “anti-competitive manner” or selectively withhold access to their property to members of any other nations.⁸

In the scenario envisioned here, the government would recognize claims and register titles, and claimants could then begin to grant, sell, and trade property deeds. The first claim would be the hardest to raise money for, which is why it would be the largest, and would also have the advantage of being able to select the most apparently promising land. For example, were this law in place today, a company like Shackleton Energy would be able to raise funds by selling its stock, the value of which would be based on the promise of the future value of the claimed lunar land itself. Once it had sent the initial settlers to the Shackleton Crater, it would apply for the title, after which it could actually start selling plots. Many, perhaps even most of the purchasers would do so with no intention of ever going to the Moon, but rather would hold their deeds as speculative investments like any other high-risk, high-reward venture. The act of selling the land would be similar to an initial public offering for the company. Once the company had raised sufficient funds with the land sales, it could afford to invest in the facilities to start to harvest ice and other resources for the manufacture of propellants, air, and other valuable materials. Similarly, asteroids or comets with favourable orbital and compositional characteristics would be the first targets of other space-resource companies, leaving less desirable real estate for the stragglers.

⁸Frans G von der Dunk, *Billion-dollar questions? Legal aspects of commercial space activities*, UNIFORM LAW REVIEW, VOLUME 23, ISSUE 2, June 2018, Pages 418–446, <https://doi.org/10.1093/ulr/uny022>

Critics and Costs

The proposed Space Settlement Prize Act embodies an approach that is sure to raise complaints from some quarters. Many environmentalists can be counted upon to criticize what they will view as the pillaging or contaminating of the solar system; their opposition to the settlement and development of space will likely lead to discussions about the price we're willing to pay for economic growth and development. Diplomats might also object to such a proposal as unnecessarily risking an upset of the international status quo. Signatories to the Moon Treaty would likely be dissatisfied with an American plan to reject their principle of sharing "mankind's common heritage" in favor of using the market to exploit raw materials available in space. And while the Moon Treaty has only fourteen signatories, some U.S. allies — Austria, Australia, the Netherlands, and Belgium — are among them.⁹

Setting aside the potential environmental and diplomatic concerns about the Space Settlement Prize Act, what would be the fiscal impact on the United States of passing such legislation? If we were pledging not only to recognize, but also to defend such claims, then it could require an increase in the Pentagon's space budget (or perhaps that of the U.S. Space Guard that James C. Bennett has proposed in these pages [Winter 2011]) that would be difficult to estimate. But the Space Settlement Prize Act as currently drafted explicitly states that it "makes no pledge of military defence of recognized extra-terrestrial properties." Recognizing and defending property claims might result in costs to our international relations, in terms of diplomatic fallout or trade sanctions. But none of this need *necessarily* result in dollar costs to the U.S. government.

Another cost would come from the need to survey the land. But this could be done by claimant, and verified by an independent entity, at the cost of the claimant, to prevent fraud. Such a survey is well within the capability of current technology and the means of private players. NASA has just released the first high-resolution topographical map of the entire lunar surface, with a resolution to 100 meters, generated by the Lunar Reconnaissance Orbiter launched in 2009. Technology is advancing rapidly in this area, and the necessary survey would be quite affordable in the context of the overall project.

Of course, in order to maximize the probability of achieving the goals of the proposed legislation, it would be useful to invest in the development of fundamental space technologies — something that NASA has traditionally done very poorly for political reasons. This could

⁹Frans G von der Dunk, *Billion-dollar questions? Legal aspects of commercial space activities*, UNIFORM LAW REVIEW, VOLUME 23, ISSUE 2, June 2018, Pages 418–446, <https://doi.org/10.1093/ulr/uny022>

mean a refocusing of NASA's mission, and a concomitant increase in its budget. These technologies might include things like life-support systems, techniques for processing lunar resources, nuclear reactors capable of running in space, advanced propulsion systems, and cryogenic storage. It might also be useful to put into place GPS-like navigation systems around the Moon and Mars and beacons out in the solar system. But the proposed legislation does not require any of this, nor any other necessary significant costs to the taxpayer.

Having understood the contentions and the cost of such arrangements, we now proceed to analyse the current legal standing regarding this matter and speculate whether changes must be incorporated and if they do, then what kind.

Space Property Rights and International Law

It is important to distinguish the Space Settlement Prize Act, which seeks to protect and advance legitimate property rights in space, from the numerous spurious claims that have been made to tracts of land on the Moon and other celestial bodies, such as those made by the "Lunar Embassy" and other novelty lunar deed mills. Such unserious claims — as well as the attempt by the private company Orbital Development to claim the asteroid Eros — were the target of a 2004 statement issued by the board of directors of the International Institute of Space Law (IISL), an organization that studies space law.¹⁰ The IISL board's statement correctly notes that the purveyors of purported lunar deeds have not acquired "legal title to their claims" and so "the deeds they sell have no legal value or significance and convey no recognized rights whatsoever." However, the statement also interprets the Outer Space Treaty more broadly than it should. The OST, recall, forbids the "national appropriation" of outer space and celestial bodies. But the IISL board's statement argues that "the activities of non-governmental entities (private parties) are national activities" and therefore any property claim in space is tantamount to a "national appropriation" and prohibited by the OST. This is not quite correct, for as we have seen, the backers of the proposed Space Settlement Prize Act argue that the government of one country could recognize a property right *on behalf of a private entity from another country* without engaging in a prohibited act of national appropriation.

Whether or not this interpretation of the OST holds water remains to be seen, since the precise meaning of the OST's restrictions remains an open legal issue for American

¹⁰Frans G von der Dunk, *Billion-dollar questions? Legal aspects of commercial space activities*, UNIFORM LAW REVIEW, VOLUME 23, ISSUE 2, June 2018, Pages 418–446, <https://doi.org/10.1093/ulr/uny022>

legislatures and courts. In fact, when U.S. government lawyers countered Orbital Development's claim to Eros, they did not even bother to invoke the OST, nor did the court address it. As a 2004 article in the *Journal of Space Law* noted, "since there is a complete absence of any showing of a property interest in Eros, the District Court did not have to construe the OST nor answer the question of whether or not the treaty prohibited private ownership of lunar or celestial property."

If we were to withdraw from the treaty to implement this legislation, would other countries counter with their own legislation recognizing different property claims?

Some critics, including Dunstan, have also objected that the proposed legislation goes too far, arguing for a more gradual, less politically disruptive approach, such as the process that has, over the decades, established property rights over lunar samples and artificial satellites.

Dunstan points to a proposal suggested by space-law analyst Wayne White, who argued that property rights be extended beyond private extra-terrestrial residential or research facilities to a "safety zone" some small distance (probably several hundred meters) around it, which he maintains would comply with the OST. However, this modest approach would not provide either the necessary certainty or the financial incentives to raise capital for launching large-scale space enterprises in the first place.



CONCLUSION:

With the current pace of technological growth and development in space sciences, there is a serious possibility of extensive private activity in the coming years. In order to ensure our existence in space it is extremely necessary to fund such space explorations and to ensure that there is a set legal framework to facilitate the private participation in it. Fresh interpretations may not suffice. we may soon have to renegotiate and amend the treaty — or even completely scrap it and start from scratch — if we want not just to protect space but to open it for settlement as a grand new frontier. There is also a widespread recognition of the need for morality in the international law in space age. The emphasis on moral approach to law is not a reaction against positivism but a parallel stream of thought. Space policy is currently underdeveloped and must focus on ensuring space security and create resilience in the same. This means not constraining the number of licences or seeing licence fees as a revenue extraction opportunity. The purpose of regulation must be to ensure compliance with nation's international obligations, ensuring safety, covering liabilities and perhaps some standardization.

Finally, it is worth noting that, while the OST arguably does not prevent the recognition of property claims per se, it may prove to be a hindrance to any kind at all of large-scale space activity, not just settlement. In that regard, this is the most troublesome sentence in the entire treaty: “The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.”

Consider the implications of the words “continuing supervision,” if taken literally. It could be argued that satisfaction of this requirement would demand that any person operating off the planet would be required to have a government minder with him at all times. Prior approval — for example, a launch license — might not be sufficient, because supervision could be argued to imply not just observation, but physical control. This wording in the treaty could imply that even the remote monitoring of private activity in space, which itself would be a significant hindrance for space settlement, would be insufficient.

