



## Who Owns Space? An Introduction to Celestial Property Rights

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### Abstract

Space mining is no longer a figment of fringe science fiction. Due to the recent passage of the Space Resource Exploration and Utilization Act of 2015 (SREU Act), U.S. domestic space companies now have a semblance of legislative backing to launch commercial resource acquisition ventures in space. Previously, such companies floundered as capital from investors was reasonably sparse. Uncertainty created by the previously untested Outer Space Treaty (OST) perpetuated worry surrounding the existence of private property rights in space. With the passage of the recent SREU Act, many domestic worries were dismissed by the definitive granting of commercial property rights to U.S. citizens, yet equally many worries continue to surround the legitimacy of the SREU Act itself, as certain legal experts both inside and outside the U.S. argue the Act to be a violation of U.S. international obligations. In contrast to the OST, the SREU Act explicitly grants Americans the right to hold and obtain material resources from celestial bodies such as asteroids and minor planets. This paper examines the implications of such a legal gray area by examining the extents to which select clauses of the OST may or may not conflict with such definitive legislation. Ultimately, it is concluded that the issue requires attention, as the existence of celestial property rights may not presently be as clear as investors might hope.

*Keywords:* Property Law, Space, Resource Acquisition, Outer Space Treaty

### Part I – Introduction to Celestial Resource Acquisition

The idea of space mining was once somewhat of an impractical pipedream. Now, however; in a period in which CEOs choose to launch Tesla Roadsters into space (David, 2018), and sovereign states willingly justify the existences of orbital military divisions (Kennedy, 2019), space mining is beginning to pique the attention of investors experienced in novel commercialization. Already embraced by U.S. company Bradford Space, the rapid growth of celestial mining interest comes as no surprise given the staggering potential for resource acquisition. 511 Davida – the most lucrative of harvestable asteroids – is often cited as a down-to-Earth example of such potential (Garside, 2021). Containing an estimated \$27 quintillion USD

of consumable resources, select scholars have even begun hypothesizing as to how such an influx of raw material might impact the global economy (Leonard, 2020). Given all of this, one might then expect resource acquisition ventures to soon capitalize on this wave of interatmospheric industrialization. Contrary to expectation however, this has thus far not been the case.

According to attorney Amanda Leon, countless explanations exist for this lack of investment: a void of interest, a heightened barrier to entry, a technological gap, a shortage of knowledge – even a lack of realizable profit margins (2018). Surprisingly, however, industry leaders point the finger at an unexpected attributor – the law (Herkewitz, 2016). Raising capital for such ventures is risky by nature; however, uncertainty is compounded when outdated international legal frameworks are also considered (Skauge, 2020). Even if successful, such ventures are implicitly subject to questions of legality; can private entities legally “own” the mined resources? Can such resources be taxed – and by whom? Without the certainty of definitive legislation, such high up-front risk was – and still is – considered an insurmountable barrier to entry for investors. Bradford Space is itself an example of such market volatility, having acquired former celestial mining firm, Planetary Resources, after an internal collapse due to lack of capital (Abrahamian, 2019).

Originating from the current legal interpretation of the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (henceforth referred to as the Outer Space Treaty or OST), this proprietary gray area invites critique from every resource-interested State. Spurred by the controversial U.S. passage of the Space Resources Exploration and Utilization Act of 2015 (henceforth referred to as the SREU Act), legal analysts have yet to reach a consensus regarding the extent to which the OST delineates boundaries of sovereign property law. By granting citizens the right to own resources acquired in interatmospheric environments, legislation such as the SREU Act represents a critical step forward for commercial space, but subjects itself to significant backlash from legal scholars who disagree with the legality of such extensions of individual freedoms. These scholars instead argue these extensions to be a violation of U.S. treaty obligations to the United Nations under the OST (Leon, 2018). Ultimately, greater consensus of understanding is needed for true legal (and financial) clarity.

This paper will underscore such legal haze by examining the extent to which a consensual definition of the OST's Non-Appropriation Principle could provide clarity to ongoing debate. Part II will begin by outlining background and exploring the relevant history and legal frameworks involved in understanding the dilemma faced within current space law. Particular attention will be paid to critical phrasing expressed within the OST (e.g., use and non-appropriation), specifically those contained within Articles I and II. Additionally, the unforeseen growth of the commercial space industry will be considered for the sake of comparative analysis and understanding on an international level. Part III will demonstrate a lack of consensus by examining the conflicting lessons learned from the current geopolitical agreements governing Antarctica and international maritime law. Simultaneously, the current array of legal philosophies both in favor and against an extension of property rights will be analyzed. Finally, Part IV will recount the legal arguments to both sides, and terminally demonstrate how a single interpretive dilemma can stagnate an entire generation of industry.

## **Part II – Ongoing Scholarship and Debate**

### **The Outer Space Treaty**

Humanity has been in discord over the ownership of space since before man even planned to step foot in it. Tracing roots back to the Cold War, the OST is a physical manifestation of said tensions, having been drafted under the pretenses of impending Soviet-American nuclear conflict (McMahon, 1962). As such, the OST was purposefully motivated to avoid provocation of military engagement; however, it simultaneously served the alternate purpose of outlining legal boundaries for exploration, scientific research, and exploitation of resources in space (Skauge, 2020). Colloquially referred to as the Magna Carta of Space (Lyall, 2009), the OST swept through the U.S. Senate with vast bipartisan support, becoming integrated within U.S. law via ratification by President Lyndon B. Johnson. The OST has since been received similarly on the world stage, having been ratified by 110 UN Member-States at the time of this paper (“Status of International,” 2019).

Included below are several provisions from the OST relating to freedom of propriety (“Treaty on Principles,” 1967). Due to the nature of this paper, diction is provided verbatim for the purposes of conventional treaty interpretation and clarity of investigation.

*Article I*

The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.

Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies.

There shall be freedom of scientific investigation in outer space, including the moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation.

*Article II*

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.

As will be expanded upon throughout this paper, the OST does not explicitly confront the issue of individual property rights. Affirming that celestial activity will be conducted in accordance with the Common Heritage Principle (Article I), the OST seems to provide ample ambiguity via chosen language in which private individuals can argue the allowed usage (and exploitation) of space, and by extension, celestial resources (Lintner, 2016). On the other hand, the Non-Appropriation Clause (Article II) definitively prohibits the claiming of national sovereignty over celestial bodies, yet fails to enumerate whether individuals or businesses have the proprietary right to resources extracted under the allowed 'use' of celestial bodies (Wrench, 2019). Herein lies the modern issue of interpretation surrounding the OST.

**Space Resources Exploration and Utilization Act**

Signed into law nearly fifty years later, the U.S. Commercial Space Launch Competitiveness Act of 2015 signified the first worldly challenge to the OST. Spurred forward as a regulatory

mechanism for the opportunistic creation of a domestic private space market, the Act served as both an amendment to existing ‘soft’ legislation regarding launches, and as an original legal framework necessary for guiding the development of private space endeavors (Randolph, 2017). Title IV, the Space Resources Exploration and Utilization Act, specifically addresses the latter by entitling all U.S. citizens to property rights in material resources obtained from outer space (“US Commercial Space,” 2015). This delineation includes the right to possess, own, transport, use, and sell said resources in accordance with applicable domestic and international laws.

Consequentially, the SREU Act has invited considerable legal critique from scholars concerned with its compatibility under the treaty parameters subjected upon the U.S. by the OST. Such scholars primarily argue the SREU Act to be a violation of the Non-Appropriation Clause, specifically basing their opposition on the phrased prohibition against national appropriation “by claim of sovereignty, by means of use or occupation, or by any other means” found within Article II of the OST (Skauge, 2020). As will be further discussed later in this paper, the ambiguous nature of the terms ‘appropriation’ and ‘use’ perpetuates a legal gray zone, as it is unclear whether the limitations expressed within the Non-Appropriation Clause extend to non-state actors who are naturally subjected to the authority of their residing governments (Lintner, 2016).

### **The Moon Agreement**

Clues to the international consensus regarding this legal gray zone can first be realized by examining one proposal designed to address it. Enacted in 1984, the United Nation’s Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, henceforth referred to as the Moon Agreement, first appeared to outline a definitive answer to the question of celestial property rights (“Agreement Governing,” 1979). For the purposes of this paper, select provisions of Article XI relating to celestial property acquisition are displayed below.

#### *Article XI*

Neither the surface nor the subsurface of the Moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person.

Notably, Article XI definitively places a moratorium on lunar resource appropriation of all forms. While this would seem to suggest that the international community has set an applicable

precedent against the existence of celestial property rights, proponents point to the general lack of support behind the legislation as further evidence to the contrary (Sattler, 2005). As of the time of this paper, eighteen sovereign states have ratified the Moon Agreement (“Status of International,” 2019). Importantly, it must also be noted that no spacefaring state has ratified the Agreement (Tingkang, 2012). Accordingly, such states like the U.S. are not bound by it under international law. The impact of this generally nonbinding legislation will be further discussed later in this paper.

### **Part III – Interpretation of the Outer Space Treaty**

#### **The Problems Caused by the Futility of the Ordinary Meaning Test**

Not unlike an American courtroom proceeding, terms expressed within the OST must be initially analyzed utilizing the ordinary meaning test if sovereign obligations are to be discerned (Leon, 2018). As discussed earlier, the key terms expressed within the OST relating to celestial property rights include ‘use’ and ‘appropriation’ as found in Articles I and II, respectively. Therefore, according to the existing judicial paradigm as set by Article 31 of the Vienna Convention, such a test naturally holds authority in analyzing Treaty terminology and should be utilized as a starting point. Unfortunately, application of this test yields little more than a “back-and-forth” discussion of ambiguity (Leon, 2018, p. 528). In both cases, no legal definition native to the chronological period of Treaty ratification provides insight to the outlaw or allowance of property rights. Consequentially, in order to address these ambiguities, legal scholars have been forced into examination of context, preparatory materials and sovereign practice. This paper will follow such examinations, ultimately drawing attention to the resulting conclusions of conflicting natures.

#### **Contextual Debates Surrounding the Non-Appropriation Principle**

Central to the point of conflict regarding celestial property rights is the Non-Appropriation Clause. For every scholar of whom does not reject an open interpretation separating resource extraction from sovereign appropriation, another scholar exists who is at the very least skeptical (Fecht, 2015). For instance, a selection of scholars have put forth arguments stating that U.S. commercial ambitions have prompted the mischaracterization of Article II’s intended meaning for the purposes of justifying resource acquisition endeavors (Jakhu, 2006). Similarly, another faction of scholars have argued that the Non-Appropriation Clause prohibits celestial property

rights until a future international delegation chooses to determine otherwise (Leon, 2018). Scholarly judgement aside, further contention has also drawn from the Non-Appropriation Clause's vague nature of prohibition (Wrench, 2019). By thoroughly omitting all mention of non-government entities, the OST naturally prompts questions regarding the universality of such prohibition. Scholars are left without answers regarding whether the Non-Appropriation Clause applies equally to states and their respective businesses, and by extension, to what extent those restrictions apply.

In order to address such questions, it must first be acknowledged that while the OST only explicitly restricts states from making sovereign claims, it would be “inherently paradoxical” to permit businesses to openly violate their states' international obligations (Wrench, 2019, p. 445). Such individual rights would be unenforceable as *Nemitz v. United States* proved by succinctly rejecting the premise that U.S. citizens may authorize ownership of celestial bodies without national approval (Wrench, 2019). Furthering this idea, such an interpretation would open the door for states to circumvent international obligations by acting-by-extension via private business. This is not to say that Article II implies total prohibition of resource title, however. Just as it is unclear whether the Non-Appropriation Clause equally applies to states and businesses, it is also unclear the scope of restriction. According to Andrew Lintner, a complete and total ban is unlikely given the lack of an explicit prohibition (2016). Unlike sovereign appropriation, Article II gives no mention to the legality of commercial exploitation, and therefore fails to clarify the matter.

Given these realities, debate becomes exacerbated by contextual additions such as the aforementioned Moon Agreement. On one hand, proponents argue that its mass rejection on the world stage is in itself evidence that the international community supports a distinction between resource acquisition and sovereign appropriation (Tingkang, 2012). As the Moon Agreement explicitly prohibits property ownership for any purposes other than scientific investigation, the sweeping international failure to ratify the Agreement is seen by some as testament to the international acceptance of individual celestial property rights. On the other hand, opponents counter that the Moon Agreement was not rejected due to its prohibition on resource titleship; instead, such scholars point to U.S. criticisms surrounding the Moon Agreement's application of the Common Heritage Principle as the actual point of dissatisfaction (Skauge, 2020). This new proposition alleges that the inherent collectivist nature of the Article was too ideologically polar

from those embraced by prominent capitalist states. Even so, such argument fails to address the mass socialist rejection of the Agreement and simultaneously suggests a need for further analysis of relevant precedents in order to achieve clarity.

### **Precedents and the Non-Appropriation Principle as Applied Historically**

Importantly, the Non-Appropriation Principle is not novel to space. International maritime law, specifically the United Nation's Convention on the Law of the Sea ("Convention," 1982), is often cited as a situationally parallel example of applied legislation in which the Non-Appropriation Principle is deemed appropriate (Randolph, 2017). As the U.S. has not officially ratified this Convention, it has alternatively relied on the interim Deep Seabed Hard Mineral Resources Act to serve as a guideline for resource extraction via private companies. Interestingly, scholars who believe there exists a natural allowance for celestial resource acquisition separate from that of sovereign appropriation point out that both of these legal regimes allow for property rights in extracted resources without violation of the Non-Appropriation Principle (Wrench, 2019). These scholars argue that under both globally recognized regimes, independent actors can extract seabed minerals without territorial claim, all the while being incentivized against de facto ownership. Critics, however, retort that such comparisons are inherently faulty by nature (Leon, 2018). While the Convention on the Law of the Sea explicitly outlines the individual's legal right to resources extracted within international waters, the OST does not do the same in regard to resources extracted from celestial bodies ("Convention," 1982). Once again, it seems as if a pattern of uncertainty has emerged regarding the divided nature of this debate.

An analysis of the Antarctic Treaty System provides further evidence for this claim. Originally tasked at mandating the peaceful uses of the southernmost continent, the Antarctic Treaty System addresses an environment not unlike that of space ("Antarctic," 2020). Filled with minerals and natural gas pockets with the potential to spark political rivalry, the desert continent has been subjected to the Madrid Protocol, an amendment to the Treaty System of which bans resource acquisition in all non-scientific regards ("Antarctic," 2020). Recalling the Moon Agreement, the Non-Appropriation clarifications expressed within the Madrid Protocol are hardly without precedent. As such, select scholars have referenced this pattern of development as evidence that celestial resources are not to be aquisitioned until a later international consensus, such as the Madrid Protocol or the Moon Agreement, can be reached (Leon, 2018). Notably, this



line of reasoning against a framework separation of resource acquisition from sovereign appropriation can be utilized as a counterexample to the previously mentioned lack of international support behind the Moon Agreement. Unfortunately for those seeking consensus, an interpretive crossroad is once again presented as proponents of such a distinction are quick to point out that the Madrid Protocol enables states to extract scientific samples “without requiring – or permitting – claims of sovereignty” (Wrench, 2019, p. 455). Because the Madrid Protocol gives no mention to altering the frameworks of the Antarctic Treaty System, proponents therefore argue the System to be a further precedent in support of the argument that acquisition, no matter the nature, remains distinct from titleship of territory. Overall, the issue once again appears polarized without hint of resolution.

#### **Part IV– Implications and Future Direction**

Taken in culmination, the general lack of scholarly consensus regarding the OST’s textual context, manner of expression, and prior international precedents does not initially bode well for present investment-interested onlookers. Examination of modern scholarly discourse reveals a currently untenable divide in which no party is proven incorrect until the OST can be tested via legislation brought forth by a sovereign power. Fortunately, as evidenced by the roughly even scholarly divide at the time of the this paper, the SREU Act can be appropriately likened to such a test. As the Non-Appropriation Principle arguably remains the root basis of disagreement between scholars, a legislative challenge to its currently interpreted application(s) will undoubtedly aid in creating a greater international consensus to some degree. By this framework, the SREU Act therefore doubles as not only a modern day invitation for international clarification, but also as an indicator that such questions of propriety require modern attention. While by no means does this achieve international consensus regarding celestial property rights, the mere existence of such a challenge signals that further international clarity may not be too far out upon the horizon.

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