

Outer Space and International Geography: Article II and the Shape of Global Order

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INTRODUCTION

In an 1898 serialized science fiction novel, Thomas Edison travels to space in true Victorian fashion, taking with him a menagerie of scientists from Earth including geologists and miners to go and attack Mars. As their adventures ensue, the intrepid group of explorers finds an asteroid made of gold that is actively being mined by the Martians:

The more we saw of this golden planet the greater became our astonishment. What the Martians had removed was a mere nothing in comparison with the entire bulk of the asteroid. Had the celestial mine been easier to reach, perhaps they would have removed more, or, possibly, their political economists perfectly understood the necessity of properly controlling the amount of precious metal in circulation. Very likely, we thought, the mining operations were under government control in Mars and it might be that the majority of the people there knew nothing of this store of wealth floating in the firmament.¹

Ever since this publication, one of the ongoing themes found in both science fiction and science fact is a human desire to access that “store of wealth floating in the firmament.” Interestingly, this early work recognizes not just the technical difficulties with extracting resources from space but also the governance obstacles of such activities.

Today, these same difficulties and obstacles remain despite the tremendous advances in both technology and governance. Setting aside the technical issues, the current challenge for both law and policy flows

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¹ GARRETT P. SERVISS, EDISON’S CONQUEST OF MARS (1898).

primarily from Article II of the Outer Space Treaty, which prohibits states from “appropriating” space, the Moon, and other celestial bodies. The problem is that Article II is notoriously ambiguous in its wording and its implications for property rights, both in terms of real property and in terms of chattel property over extracted space resources. While this ambiguity has been a boon to scholars looking for tenuous situations to write articles on, it is now being cast as an obstacle for an emerging group of private enterprises that aim to extract and to use for commercial purposes the vast resources that are floating in the firmament. This article will delve into this ambiguity in order to elucidate the content of the Article II norm in light of its history and of state practice.

This article will first contextualize Article II to better understand its origins. This section will argue that the original intent behind the adoption of Article II was to settle questions of international geography, namely the nature of state territory in space, which accounts for its silence in terms of property. This discussion will lay the foundation for the ensuing analysis of property in the outer space environment. The second section of this article will examine a variety of precedents that help reveal the nature of Article II as understood by the state parties to the Outer Space Treaty in relation to space resources. This analysis will examine state practice with regard to territorial claims, real property claims, and chattel property claims, which all touch on the legal content of Article II. Finally, this article will address the future of the non-appropriation principle and argue that it can accommodate both the maintenance of stability and security in space as well as proposed commercial use and exploitation of space resources. This section will conclude by arguing that states should avoid a race to bottom in terms of developing legal regimes surrounding property rights and resource extraction in space by balancing the benefit of the commercial activity with the values and principles that underpin international space law.

Before starting in this endeavor, it is important to note what this article will not do. First, this article will focus squarely on the law and policy found within the bounds of the Outer Space Treaty and customary international law. It will not delve into the Moon Agreement in depth, though reference will be made as needed. This is because the Moon Agreement, while positing a workable system for the use and exploitation of extraterrestrial resources, has not been widely accepted and serves a minor role in the contemporary regime. Second, this article will not attempt to offer a solution to the Article II problem. While it will suggest that there are core values that need to be implemented in any regime or institution that regulates resource extraction, whether domestic or international, it will stop short of detailing specific recommendations for those regimes.

I. A Funny Thing Happened on the Way to the Moon

The non-appropriation principle first found its way into the vocabulary of international space law in the 1961 United Nations General Assembly (UNGA) resolution on outer space. Resolution 1721 (XVI) “commends” states to use space according to two principles:

- (a) International law, including the Charter of the United Nations, applies to outer space and celestial bodies;
- (b) Outer space and celestial bodies are free for exploration and use by all States in conformity with international law and are not subject to national appropriation.²

This is the first time that a UNGA resolution refers to “principles” guiding space activities.³ As a result, these two principles maintain a place of primacy in space law and touch on the legality of all space activities engaged in or attributable to states. To add weight to this proposition, this resolution was decided without a vote, meaning that if not unanimous there was, at least, little controversy in the content of these provisions.⁴ Of course, it is prudent to note that a UNGA resolution is not binding on states, but unanimous adoption of “principles” is at the very least strong indication of international political will.⁵

What we see then, at the earliest inception of rules regulating space, is an emerging consensus as to the application of international law as a governing system, and the exclusion of space and celestial bodies from “appropriation,” whatever that may mean.⁶ Over fifty years later, these principles remain at the core of the international space law regime as Articles I, II, and III of the Outer Space Treaty. But, to be quippy, a funny thing happened on the way to the Moon. While the application of international law to outer space has remained non-controversial, the content of Article II has increasingly been the target of criticism by scholars, politicians, and commercial actors alike. This criticism posits that

² G.A. Res. 1721, U.N. GAOR, 16th Sess., Supp. No. 17, vol. XVI, at 6, U.N. Doc. A/RES/1721 (XVI) (1961).

³ See, e.g., G.A. Res. 1348, U.N. GAOR, 13th Sess., Supp. No. 18, vol. I, at 5–6, U.N. Doc. A/RES/1348 (XIII) (1958); G.A. Res. 1472, U.N. GAOR, 14th Sess., Supp. No. 16, at 5, U.N. Doc. A/RES/1472 (XIV) (1959) (illustrating that while earlier resolutions do not mention items such as “benefit of all mankind” and “peaceful purposes,” which later becomes principles guiding outer space activity, they fall short of referring to them as such”).

⁴ *Resolutions Adopted by the General Assembly at its 16th Session*, UNITED NATIONS, <https://perma.cc/4927-DS7T> (last updated June 4, 2019).

⁵ See BIN CHENG, *STUDIES IN INT’L SPACE LAW* 136–37 (1997) (arguing that under certain circumstances UNGA resolutions can create “instant” customary law, but he argues against these early resolutions taking on such status).

⁶ G.A. Res. 1962, U.N. GAOR, 18th Sess., Supp. No. 15, vol. XVIII, at 15, U.N. Doc. A/RES/1962 (vol. XVIII) (1963) (confirming a set of “legal principles” that govern outer space).

non-appropriation, instead of being a critical principle in international space law, is a central downfall in the entire regime.

This section seeks to trace this history, and contextualize non-appropriation within the competing narratives on its purpose to better understand how the consensus seen in the early UNGA resolutions has eroded. It will argue that non-appropriation was a mechanism through which the outer space environment could be brought into the logics of international geography, and that this has left severe ambiguity as to the nature of property rights in space and over space resources.

A. *International Geography*

Before jumping into the specifics of the non-appropriation principle, it is important to characterize it within the larger legal system. While international space law is a *lex specialis*, it exists within the confines and logics of international law. Resolution 1721 (XVI) acknowledged that states, as the traditional subjects of international law, agreed that international law would be the governing system in outer space. At the time, this was critically important. International law, and importantly its core goals, were significantly remade after World War II through the adoption of the UN Charter, which deployed a specific geography that will be referred to as the “international geography” herein.

The post-1945 settlement of international law represents the most recent in a number of reorganizations of “world-scale” governance.⁷ Stemming from the European tradition, the history of international law is marked by the accommodation of new areas or spaces that do not fit within the scope of the reigning contemporary spatial order. Indeed, the roots of international law attempt to explain how the high seas and the newly discovered (by the Europeans, at least) New World fit within the settled spatial order at the time.⁸ Similarly, the Peace of Westphalia redeployed geography within Europe to establish the concept of territorial sovereignty through the establishment of the state as an entity.⁹ Throughout each of these iterations of geography, the developing international legal system sought to categorize all physical areas and impose on each a specific legal geography.

The result of World War II, in legal terms, was no different. The UN Charter imposes a specific legal geography at the world-scale, which

⁷ See SASKIA SASSEN, *TERRITORY, AUTHORITY, RIGHTS: FROM MEDIEVAL TO GLOBAL ASSEMBLAGES* 14 (2006).

⁸ See CARL SCHMITT, *THE NOMOS OF THE EARTH IN THE INTERNATIONAL LAW OF THE JUS PUBLICUM EUROPAEUM* 42–44, 86, 140 (2003); MANFRED LACHS, *THE LAW OF OUTER SPACE: AN EXPERIENCE IN CONTEMPORARY LAW-MAKING* 19–20 (2010); IAN CLARK, *LEGITIMACY IN INTERNATIONAL SOCIETY* 35–38 (2005).

⁹ SCHMITT, *supra* note 8, at 143–45.

shapes the contours of global order. This order again attempts to encompass all spatial areas on Earth and apply specific legal categorization to each area. At the highest level, the system differentiates between spaces that are state territories or spaces that are non-territorial, such as global commons.¹⁰ Territory is the space within a state's borders, and is therefore subject to the local rules of that state. The UN system allows states to become members of the UN, which grants them the right to have their "territorial integrity" respected by other members.¹¹ The UN system does allow for non-self-governing areas, which are those overseen by another state or the UN. These spaces are excluded from UN membership, but the governing authority is given the duty to "their progressive development towards self-government or independence," indicating the goal that these spaces become territory.¹² This second category is notable because the UN Charter began the process of delegitimizing colonization and conquest by force as the age of empires wound to a close. The international geography deployed by the UN Charter is one in which land area is (or as soon as is feasible in the future will be) part of the territorial sovereignty of a state. It attempts to create a seamless geography of hard borders that are legally impervious from interference from external entities.¹³ Territory in this system becomes synonymous with legal personhood, and the right to exclude others from it are connected less with notions of ownership and more with notions of political autonomy of each state as a sovereign equal.

The 1945 system adopted the traditional rules governing the high seas since they were traditionally outside of state territory, as indicated by the historical three-mile rule, which represented the physical limitations of state control in terms of the distance a cannonball could fire.¹⁴ Early on the system was presented with the problem of the status of Antarctica. Under the traditional rules, states had made imperialist claims to the Antarctic continent. Antarctica, though, was not so much the introduction of new physical space as much as it was a problem of sorting out competing claims that emerged within the previous legal system. Antarctic law functions based on the permanent suspension of territorial claims to the landmass by the states that maintained them at the dawn of the modern system.¹⁵

Therefore, outer space became the first challenge to the new system of

¹⁰ See P.J. Blount & Christian J. Robison, *One Small Step: The Impact of the U.S. Commercial Space Launch Competitiveness Act of 2015 on the Exploitation of Resources in Outer Space*, 18 N.C. J. L. & TECH. 160, 170–72 (2016) (discussing global commons as a typology of spatial order).

¹¹ U.N. CHARTER, art. 2, para 4.

¹² U.N. CHARTER, art. 76(b).

¹³ See SCHMITT, *supra* note 8, at 185, 187 (referring to the "bracketing" of war).

¹⁴ SCHMITT, *supra* note 8, at 183.

¹⁵ Antarctic Treaty, Dec. 1, 1959, T.I.A.S. No. 4780, 402 U.N.T.S. 71, 12 E.S.T. 794, (entered into force June 23, 1961).

international law in terms of the introduction of new spatial possibilities, and it cannot be overstated that new spatial possibilities had the potential to shake the new system to its core. A critical goal of a seamless international geography was the elimination of war. The architects of the system would have been acutely aware that historically a major cause of war was the military conquest of new territories, which was the hallmark of the preceding imperial system of world-scale governance. While the orbiting of *Sputnik I* ushered a myriad of issues into world politics, central to these was how to keep conflict resulting from territorial conquest of space. Such conquest was de-legitimized as a matter of international law in the post-1945 settlement, which rejected imperialism as a mechanism of world-scale governance. However, this depended on the seamless international geography imposed by the UN Charter, which did not contemplate space activities. Extending international law into space was the first step in making space part of the international geography and rejecting notions of imperial conquest. The non-appropriation principle, in effect, categorizes space and celestial bodies as “not territory” so as to revoke the incentives that drive such conquest.

Article II must be read in terms of its fit within the international legal system as a rejection of imperial processes within outer space or on celestial bodies. Its core goal, similar to international law in general, is not to characterize territory or things as “ownable,” but instead to promote international peace and security by delineating between the spatial area in which a state has sovereignty and spatial areas in which the state does not. Rather than “ownability,” the non-appropriation principle is about “rulability,” that is whether or not a state can govern a territory.

B. *The Outer Space Treaty and the Geography of Space*

It is within this context that we must approach the non-appropriation principle as codified in Article II of the Outer Space Treaty. This subsection will attempt to show how Article II functions within the text of the treaty as a whole, and indicate the ambiguities inherent in the construction of Article II.

Article II states simply that “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.”¹⁶ Before delving into the text of the provision itself, it should be noted that the non-appropriation principle was well established by the time that the Outer Space Treaty was negotiated through consecutive consensus

¹⁶ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies art. II, Sept. 25, 1967, 610 U.N.T.S. 205 (entered into force Oct. 10 1967) [hereinafter Outer Space Treaty].

adopted UNGA resolutions.¹⁷ Further, the Outer Space Treaty was a product of the consensus process of the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS).¹⁸ At the international level there was consensus on the principle. Indeed, as Gangale shows us, the principle was not the subject of intense debate either during the negotiation process nor the ratification process.¹⁹

The states that were adopting the treaty did not understand Article II to be in conflict with either international law or domestic law. It is submitted that this is because states primarily understood Article II as an articulation of international geography rather than an articulation of a limitation on the right to use outer space and celestial bodies, a right that takes a primary position in Article I of the Outer Space Treaty. As a result, the *travaux préparatoires* does little to elucidate the content of Article II as it relates to ideas of property.²⁰ While Article II itself is ambiguous, it is important to remember that it must be read within the overall purpose and scope of the treaty as other treaty provisions can add significantly to our understanding of Article II.²¹

The first thing to note is that Article II effectuates a ban on “national appropriation,” but this term is not defined. Even more problematic, the legal term is unique to the space context and is not found in other international agreements governing non-territorial areas. Indeed, international law is most often concerned with the “acquisition” of territory.²² Non-appropriation does, however, ring true to the anti-imperial aspirations of the Outer Space Treaty, which tracks with the ideological common ground between the two Cold War superpowers of the US and the USSR. It also tracks with the newly deployed international geography, which for the first time in global history attempted to contain all terrestrial spaces within the bounds of national borders that marked states as holders of legal personhood within the system. This legal autonomy was protected by a legal prohibition against the use of force, which was intended to

¹⁷ Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, Dec. 13, 1963, U.N.G.A. Res. 18/62 (stating that the 1963 Declaration of Legal Principles is widely accepted as a statement of customary international law); G.A. Res. 1962, U.N. GAOR, 18th Sess., Supp. No. 15, vol. XVIII, at 15, U.N. Doc A/RES/1962 (vol. XVIII) (1963) (confirming a set of “legal principles” that govern outer space).

¹⁸ Sergio Marchisio, *The Evolutionary Stages of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)*, 31 J. SPACE L. 219, 224 (2005).

¹⁹ Thomas Gangale, *The Legality of Mining Celestial Bodies*, 40 J. SPACE L. 187, 193 (2015–2016).

²⁰ *Id.* at 196–205.

²¹ Vienna Convention on the Law of Treaties art. 31, Dec. 28, 1979, 1155 U.N.T.S. 331 (entered into force Jan. 27, 1980).

²² MARTIN DIXON, *TEXTBOOK ON INTERNATIONAL LAW*, 161 (7th ed. 2013); R.Y. JENNINGS, *THE ACQUISITION OF TERRITORY IN INTERNATIONAL LAW* 1–2 (1963).

harden those borders against conquest.

The discrepancy between the idea of appropriation and the idea of acquisition is not a large one. "To appropriate" means to "take exclusive possession of," and "to acquire" means to "get as one's own."²³ Both of these imply the idea of ownership, but "to appropriate" is a more active form in that it requires an affirmative act, whereas "to acquire" includes possibilities of coming into possession without affirmative action. In other words, if one finds a painting on the sidewalk and keeps it, that individual has both acquired and appropriated the painting. Whereas if the painting is left as an inheritance in a will, it has been acquired but not appropriated. The distinction may seem subtle, but it is an important one in light of the text following the ban on national appropriation, which enumerates ways in which appropriation might happen. This text names three ways in which appropriation is disallowed.

First, Article II disallows national appropriation by "a claim of sovereignty." Under international law, an "apparent display of sovereignty" is "at the heart of acquisition of sovereignty."²⁴ Historically, this concept is linked directly to the idea of planting a flag on new territory as a way of claiming it for the state, as well as the removal of the previous sovereign's flag upon defeating that sovereign. Flag planting was an overt imperial act through which a state added new territories, and the flag itself represented not only the sovereign, but also the military force that the sovereign might employ to defend the claim. Article II then can be read as outlawing the practice of "claiming sovereignty" in an imperial manner over newly discovered areas in the outer space environment.

Second, Article II makes clear that national appropriation cannot occur as the result of use or occupation by a state. Indeed, the international law system does not recognize simple claims of sovereignty, for these to convert into territorial acquisition there must be a showing of "effective occupation," even in the case of newly discovered uninhabited territory.²⁵ This second Article II prohibition separates the idea of occupation from territorial acquisition in space. It is important to note that the ban on "national appropriation" by "occupation or use" is not equivalent to a ban on occupation or use of outer space and celestial bodies. Indeed, such an interpretation would destroy the internal logic of the Outer Space Treaty. Article I of the Outer Space Treaty specifically gives states the right to "use" outer space and celestial bodies. Further, Article XII acknowledges that states may have "stations" and "installations" on the Moon and other celestial bodies, meaning that some form of occupation is indeed allowable

²³ WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 18, 106 (Phillip Babcock Gove ed., 3d ed. 2002).

²⁴ DIXON, *supra* note 22, at 162.

²⁵ DIXON, *supra* note 22, at 167.

under the Outer Space Treaty. If Article II is understood as a ban on occupation and use, then the entire treaty descends into incoherency. Article II, in this respect, must be understood as banning something very specific, which is the acquisition of territory over which the sovereign has full authority that results from occupation or use.

The final prohibition in Article II is the most open ended as it bans “national appropriation . . . by any other means.”²⁶ This open endedness, of course, makes it quite difficult to apply.²⁷ It is unclear what might constitute another means of appropriation.²⁸ Some indication can be found in the two previous prohibitions, which track with historical methods under international law for the acquisition of national territory.²⁹ Therefore, it is safe to say that other methods, maybe less likely ones, are also illegal such as conquest by force or the use of a bilateral treaty.³⁰ The problem is that this clause’s indefiniteness leaves open an array of activities that may or may not constitute an appropriation under Article II.³¹ For instance, if a state were to recognize a real property interest in a tract on a celestial body, would that amount to an Article II appropriation?³² This question will be returned to below.

The text does contain an important clue to sorting out Article II in such a way that it makes sense in relation to the rest of the treaty, which, as already noted, allows for use and occupation.³³ Astute readers have likely already been pondering the meaning of the adjective “national” in front of appropriation.³⁴ Article II does not ban all appropriations, it bans appropriations of a national character, that is appropriations that link physical areas of outer space to the legal personhood of the state.³⁵ The post 1945 international geography associated legal autonomy with territory.³⁶ The idea of the United Nations is built on sovereign equality of independent territories, and the UN Charter is directed at establishing

²⁶ United Nations Treaties and Principles on Outer Space art. II, 2008 U.N.T.S. 11.

²⁷ See Stephen Gorove, *Interpreting Article II of the Outer Space Treaty*, 37 *FORDHAM L. REV.* 349, 349 (1969).

²⁸ See Gorove, *supra* note 27 at 349.

²⁹ See Gorove, *supra* note 27 at 350.

³⁰ DIXON, *supra* note 22 at 167–69 (noting that the Article IV ban on weapons of any sort on celestial bodies confirms the idea that military conquest is banned).

³¹ NEED THROUGH ILL

³² See Robert Kelly, Note, *Nemitz v. United States, a Case of First Impression: Appropriation, Private Property Rights and Space Law before the Federal Courts of the United States*, 30 *J. Space L.* 297, 305–09 (2004).

³³ Outer Space Treaty, *supra* note 16.

³⁴ Outer Space Treaty, *supra* note 16.

³⁵ Outer Space Treaty, *supra* note 16.

³⁶ THE POLITICS OF GLOBALITY SINCE 1945 2–4 (Rens van Munster & Casper Sylvest, eds., 2016).

“friendly relations among nations.”³⁷ The post-1945 international geography is one concerned with solidifying nations by linking them with distinct territory, and the introduction of the vastness of space served to destabilize the new balance struck among nations.³⁸ As a result, the non-appropriation principle is directly connected to the idea of national or state action through which a state may appropriate part of the vastness of space into its own legal personality as a state.³⁹ This is confirmed by Article VI of the Outer Space Treaty, which holds states responsible for the “national activities” of non-governmental actors.⁴⁰ Again, in context the “national” indicates a nexus with the state and therefore a nexus with national territory.⁴¹ It should be noted that even in the various UNGA resolutions “appropriation” is preceded by “national” further indicating that the core concern of the principle is with actions that create a nexus between an area in outer space and the territorial identity of a state.⁴²

This section has argued that as a matter of international law, Article II is concerned with the acquisition of territory by a state and the extension of sovereignty over that territory. This interpretation places Article II in a state of coherence with the rest of the treaty, but it does not solve the deeper problem of the status of property rights by private entities in the space environment. This is because, while Article II is, in this author’s opinion, purposely silent on the issue of property, it is not entirely disconnected from the concept of property. Quite the contrary, in the international geography deployed by the UN Charter the idea of property is directly connected to a state’s territory and its sovereign authority over that territory. This issue will be taken up in the next subsection.

C. Property

It is this author’s anecdotal experience that, in general, when the idea of space law is first suggested to someone unfamiliar with the concept that person’s most likely response is: “you mean like who owns the Moon?” Methodological considerations of this survey aside, this response is revealing. The law in this case is quickly associated with the question of the division of spatial territory into legal categorizations. Other topics,

³⁷ U.N. CHARTER, art. 1, para. 2.

³⁸ THE POLITICS OF GLOBALITY SINCE 1945 3 (Rens van Munster & Casper Sylvest, eds., 2016).

³⁹ Fabio Tronchetti, *The Non-Appropriation Principle Under Attack: Using Article II of the Outer Space Treaty in its Defence*, (50th International Colloquium on the Law of Outer Space) 1 (2017).

⁴⁰ Outer Space Treaty, *supra* note 16.

⁴¹ Outer Space Treaty, *supra* note 16.

⁴² G.A. Res. 72/77, U.N. GAOR, International Cooperation in the Peaceful Uses of Outer Space, U.N. Doc. A/Res/72/77 (2017).

such as liability for torts or contracts involved in space activities are secondary in the general legal imagination. We, as a society, want to know who owns a place because it is fundamental to our conception of law.⁴³ Ownership is an effect of the legal situation of the territory in which you are standing, so while the idea of territory is separate from property, the nature of property is an effect of territorial division.⁴⁴ This is because as a matter of contemporary international law, property is a local issue and its nature changes as an individual moves from one autonomous territory to another.⁴⁵

Article II is silent on property. It neither confirms that property rights may exist, nor does it affirmatively deny such rights.⁴⁶ This leaves a deep rift between the concepts of territory and property, which is one of the reasons that Article II is so hotly debated.⁴⁷ This rift exposes the tension between the post-1945 territorial settlement and the roots of international law, because it forces the question of whether property rights can exist without sanction by a state.⁴⁸ Thus, to truly grasp the meaning of Article II, it is important to understand that international law itself is a product of the development of a Western liberal world order. International law emerges from the European continent in the form of rules that European powers used to stabilize the region and differentiate it from other regions that could be subjected to European power.⁴⁹ Indeed, until 1945, the idea of “civilized” reigned supreme in determining which territories had rights under international law and which might be subject to imperial power.⁵⁰ Not surprisingly, in the early days Europe was “civilized” and the rest of the world was not.⁵¹ As subsequent iterations of international legal order

⁴³ SCHMITT, *supra* note 8, at 42. (This is why Schmitt argues that “[l]aw is bound to the earth and related to the earth.”)

⁴⁴ See Anna Stilz, *Nations, States, and Territory*, 121 ETHICS 572, 572 (2011) (To be clear, this is not a natural or necessary structure. For instance, if the political will was extant, then states could adopt within international law universal articulations of property rights. The fact that states did not do this pushes the notion of property to the territorial sovereign to decide.)

⁴⁵ See John G. Sprankling, *The Emergence of International Property Law*, 90 N.C. L. REV. 461, 463 (2012).

⁴⁶ See Outer Space Treaty, *supra* note 16.

⁴⁷ See Timothy Justin Trapp, *Taking Up Space by Any Other Means: Coming to Terms With the Nonappropriation Article of the Outer Space Treaty*, 4 U. ILL. L. REV. 1681, 1691 (2013).

⁴⁸ See generally JOHN LOCKE: TWO TREATISES OF GOVERNMENT, SECOND TREATISE 368 Sec. 123 (Peter Laslett ed. 1970) (2d ed. 1698).

⁴⁹ SCHMITT, *supra* note 8, at 140; CLARK, *supra* note 8, at 35; see Manti Koskenniemi, *International Law in Europe: Between Tradition and Renewal*, 16 EUR. J. INT’L L. 113, 117 (2005).

⁵⁰ See Emmanuelle Tourme-Jouannet, *The International Law of Recognition*, 24 EUR. J. INT’L L. 667, 668–69 (2013).

⁵¹ See Jessie Szalay, *What Was The Enlightenment?*, LIVE SCIENCE (July 7, 2016), <https://perma.cc/B8H9-KGJ8>.

were articulated and more places became “civilized” in a European sense, the global spatial order was reworked, but within a framework built on pre-existing Western values.⁵²

Of great importance to the topic at hand, a Western liberal system meant that natural law theory and specifically a Lockean conception of property was integrated into the international legal system. John Locke’s theory of property was that in a state of nature, humans could expend labor to improve a spatial area and that they thereby gained a natural right of ownership over that area effectively converting it into property.⁵³ Lockean philosophy is often used to justify property rights in outer space, and invoked as a natural right that supersedes international law and Article II specifically.⁵⁴ This argument assumes that if an individual were to go into space and exert labor to develop a celestial body, then that portion over which labor was exerted should become the property of that individual as a natural right that exists outside the scope of the state. Such a right has been acknowledged in international law, and there are numerous nineteenth and early twentieth century cases that acknowledge such rights in situations when an individual has labored to improve land in a territory that is *res nullius* and which is subsequently subject to a claim of sovereignty.⁵⁵ This conception casts property as a natural right that precedes the establishment of sovereignty over territory.

The Lockean argument has three important limitations in its application to outer space. The first limitation is theoretical. Locke’s natural right only exists in a state of nature, and it acknowledges that government becomes a necessary condition for maintaining that right. In Locke’s state of nature, the natural right is a moral one, but is still subject to superior force of others. As a result, Locke’s state of nature demands the establishment of positive property rights protected within society through governmental functions to ensure that force does not become the true measure of property rights. Locke’s theory to some extent embraces the idea that, though property may naturally occur, the state becomes a necessary entity for its preservation.

The second limitation is the extent to which we can say Lockean theory is part of the post-1945 international legal system, which is avowedly positivistic. One of the issues that the negotiators of the UN system had to account for, to ensure a seamless international geography, was the need to

⁵² CLARK, *supra* note 8, at 156.

⁵³ L. Benjamin Ederington, *Property as a Natural Institution: The Separation of Property from Sovereignty in International Law*, 13 AM. U. INT’L L. REV. 263, 266–70 (1997).

⁵⁴ See Gangale, *supra* note 19, at 189 (noting that “‘national appropriation’ does not in any way derogate the natural law principle of creating property through the mixing of labor and soil”).

⁵⁵ See generally Ederington, *supra* note 53.

have all global powers be a party to the new system despite their ideological differences. The problem of non-participation was all too evident in the failure of the League of Nations. The negotiators needed to accommodate not just Western liberal political systems, but Marxist systems as well. Marxist systems, obviously, maintain a fundamentally different conception of property that rejects Lockean ideals. This is why, under international law, property is treated as a local issue. Like other human rights, states were left substantially free to order property within their borders in any way that was deemed fit by the governing authority. Property became a function of a state's domestic law, and to this day all states maintain different sets of rights applicable to property ownership within their borders based on the physical characteristics of the territory and the political ideology of the government. This positivistic turn in international law uproots Locke as a foundational theory in order to achieve a seamless global geography through the inclusion of non-Lockean systems.

The final limitation to the Lockean argument is that Articles II and III of the Outer Space Treaty serve to eliminate the state of nature. Locke's state of nature is best understood as a thought experiment to imagine how law emerges when there is no law. Locke's notion was linked to spaces that sat outside of legal jurisdiction.⁵⁶ While the space environment is for the most part untouched by humans and still exists in its "natural state," space is not a state of nature in Lockean terms because a governance system has been imposed on it. Article III of the Outer Space Treaty effectively extends international law into the space domain, meaning that a legal regime exists there. Further, Article I and II serve to acknowledge that states do not view outer space as *res nullius*, that is as belonging to no one and therefore subject to conversion into property through labor. Instead, the Outer Space Treaty, in addition to the non-appropriation principle, states that space is the "province of all mankind," which most commentators have deemed to create a *res communis* or in more modern terms a global commons.⁵⁷ While the use of ancient Roman legal terms has rightfully been critiqued,⁵⁸ it is very clear that the legal status of space is different in kind than the theoretical state of nature as described by Locke.

The problem that results is that states are free to explore and use space, as are their authorized private actors, but states are unable to appropriate space "by any other means." This results in significant limitations on a

⁵⁶ See SCHMITT, *supra* note 8, at 97.

⁵⁷ See LACHS, *supra* note 8, at 43–46. *But see* Henry Hertzfeld, Brian Weeden & Christopher D. Johnson, *How Simple Terms Mislead Us: The Pitfalls of Thinking About Outer Space as a Commons* (58th IISL Colloquium on the Law of Outer Space) 533, 534 (2015).

⁵⁸ PHILIP DE MAN, EXCLUSIVE USE IN AN INCLUSIVE ENVIRONMENT: THE MEANING OF THE NON-APPROPRIATION PRINCIPLE FOR SPACE RESOURCE EXPLOITATION 18–33 (2016).

state's ability to protect property rights that could result from such use. If a state were to sanction a private claim for real property in space, it could amount to an assertion of sovereignty over the territory containing the claimed property. Thus, claims of real property that assert exclusive control over a spatial territory in space are likely prohibited by Article II, due to the fact that state parties are disallowed from enforcing such rights. This should not be surprising as similar claims to the high seas, deep seabed, or Antarctica would have similar difficulties due to a state's inability to enforce those rights. This however, is not the end of the story, because states can and do recognize property rights in movable property that is attained outside its borders and specifically from global commons.

While each of the above mentioned global commons excludes the possibility of claims for real property, each has a unique regime for the exploitation of the resources found within. The Antarctic regime bans all commercial use, whereas the deep seabed regime establishes an international organization for the management of rights over extracted resources. The high seas regime allows private actors to extract resources at will, as long as they are in compliance of the laws of their local flag state (which often incorporate international obligations), and gain direct property rights over those resources, namely fish. This illustrates that under international law, the legal recognition of rights in extracted resources is a possibility in a global commons as part of the international geography. The question is whether Article II allows such recognition. The answer to this is murky at best due to the ambiguous language of the Outer Space Treaty. However, we can look to state practice to see how states are interpreting their obligations under Article II.

II. Space Property in State Practice

State practice on the nature of property rights in space is scant. Few states have the technological capability simply to make it to celestial bodies much less to maintain activities or return resources. The record is not devoid of state practice, though. There are hints at how states interpret their obligations under Article II that help to clear up some of its ambiguous language. This practice falls into the following categories: direct state action in space relating to territory and resources, private claims to real property in space, and private ownership of extracted celestial material.

A. States in Space

Three states have effectively gone to celestial bodies and returned with celestial material from space to Earth: the United States, the Soviet Union, and Japan. Each of these states' actions constitute state practice under Article II. This section will address two aspects of these missions: first, the way that states behaved in relation to possible territorial claims made by

their landings; and second, the way in which states have behaved in relation to the extracted portions of those celestial bodies.

1. Territorial Claims

To be clear, no state has ever claimed any part of a celestial body as its sovereign territory. The lack of these types of claims is an important indicator of the content of Article II, but analysis should not stop there as there is definite nuance to the way in which states, and specifically the United States, have treated their interactions with celestial bodies.

In 1959, the Soviet Union became the first state to launch a spacecraft that reached the surface of the moon, *Luna-2*. This craft engaged in scientific experiments, but a notable aspect of it was that it contained a spherical device with pendants or medallions that were intended to scatter on the surface of the Moon upon impact, presuming they survived the impact. These medallions contained the state symbol of the USSR, and the words “USSR September 1959” (in Russian of course).⁵⁹ The placement of a state symbol on the Lunar surface bears significant resemblance to imperial practice of planting a flag, a symbol of state sovereignty, on newly discovered territory as an assertion of a state’s rights to that territory. However, there is no indication that the Soviet Union ever asserted such rights to the territory touched by these medallions. At the time, *Luna-2* was painted as a victory for the Soviet space program, which was quickly racking up “firsts” in space much to the United States’ dismay. Days after the *Luna-2* impact, Soviet premier Nikita Khrushchev landed in the United States for a state visit. Though tensions were high between the Cold War leaders, Khrushchev presented President Eisenhower with a replica of the *Luna-2* sphere, as both a sign of international friendship and a Cold War jab.⁶⁰ It should also be noted that the Soviet Union, upon signing the Outer Space Treaty made no mention of any claim effectuated by the *Luna-2* landing, and its acceptance of the treaty can be seen as disclaiming any residual claims that it may have retained.

The United States became the first nation to land a human on the Moon in 1969 with its *Apollo 11* mission. *Apollo 11* astronauts, and those of the subsequent *Apollo* missions, planted a United States flag on the surface of the Moon. Similar to *Luna-2*, this act has all the trappings of traditional imperial claims to newly discovered territory. In fact, the *Apollo* missions amplify this through the use of an actual flag, which carries specific significance when associated with a sovereign power, and also through the accompanying human presence, which could be argued to give more

⁵⁹ Richard Cavendish, *The Soviet Union is First to the Moon*, HISTORY TODAY (Sept. 9, 2009), <https://perma.cc/3VPY-WRKB>; Becky Ferreira, *The Other First Moon Landing*, MOTHERBOARD (Sept. 14, 2009), <https://perma.cc/XXY9-6W6H?type=image>.

⁶⁰ Ferreira, *supra* note 59.

substance to a possible claim than a spacecraft alone. Unlike *Luna-2*, the Moon landing occurred in the wake of the Outer Space Treaty, and the United States at the time was keen to ensure that it complied with the treaty in order to maintain international peace and security. As a result, each of the *Apollo* landers, which remained on the lunar surface along with the flags they carried, had a plaque attached to them that served to disclaim any notion of conquest by the United States. The *Apollo 11* placard specifically did this stating: “Here men from the planet Earth first set foot upon the Moon, July 1969 AD. We came in peace for all mankind.”⁶¹

There are two important aspects to this placard. First, it characterizes the astronauts simply as “men” rather than as representatives of a specific sovereign.⁶² Second, it echoes the notion found throughout international space law that space should be used for peace and for the benefit of all humankind. What this placard serves to do is represent the actions of the *Apollo* astronauts as being on the behalf of the entire global population. While the United States certainly wanted its mark on that landing, thus the flag, the words that it used to describe the landing did not assert any claim of sovereignty. This is of course echoed by Neil Armstrong’s words, broadcast internationally, that this was “one small step for man, one giant leap for mankind.”

What can be gathered from the actions of these two states is that claims of an imperial nature, that is those made through discovery of new territory in space, do not fall within the confines of that which is allowed by Article II. This of course tracks with the anti-imperial language that these two superpowers were able to agree on when negotiating the Outer Space Treaty.

There is one small coda that should be included here. In 1976, eight equatorial countries issued the Bogota Declaration as a protest to what they felt was an inequitable division of the Geosynchronous Orbit (GEO).⁶³ The declaration stated that each of the countries claimed sovereignty over the portion of the GEO orbit that was directly above their territory. This claim was built on the idea that GEO is a natural resource, and that its unique physical characteristics linked it directly to the territory below. Colombia went so far as to include this claim in its Constitution.⁶⁴ In general, the

⁶¹ *Apollo 11 Plaque Left on the Moon*, NASA, <https://perma.cc/U7FM-RWZE> (last visited Sept. 7, 2019).

⁶² See Outer Space Treaty, *supra* note 16, art. V (tracking with the Outer Space Treaty, which declares Astronauts to be “envoys of mankind” rather than envoys of their respective states).

⁶³ See Declaration of the First Meeting of Equatorial Countries, JAXA, <https://perma.cc/C9SB-FYFZ> (last visited Oct. 27, 2017).

⁶⁴ COLOM. CONST. art. 101.

international community has never recognized these claims. Additionally, all of these states are participants in the International Telecommunication Union (ITU), which coordinates GEO usage, five are state parties to the Outer Space Treaty, and two more have signed but not ratified the Outer Space Treaty.⁶⁵ Also of note is that the ITU was reorganized in the early 1990s in part to better address the claims of developing nations to access to telecommunications including GEO.⁶⁶ As a result, the Bogota Declaration is likely now little more than a historical footnote, and its rejection by the international community indicates a rejection of territorial claims in space.

2. Sample Return

There are three examples of states engaging in sample return missions. A sample return mission is a mission that endeavors to collect matter from space and return it to the surface of the Earth.

The first of these missions was *Apollo 11*, and each subsequent *Apollo* mission returned to the surface of the Earth with lunar material.⁶⁷ Interestingly, the *Apollo 11* astronauts filled out a customs form acknowledging the importation of the material.⁶⁸ The lunar samples that were returned, are administered by NASA. In addition to research done by the United States with these samples, the United States distributed these samples to other states for the purposes of scientific research and also as diplomatic gifts. Both of these uses of the lunar samples can be argued to support the goal of using space for the benefit of humankind, and they have been unprotested.

Shortly, after *Apollo 11*, the Soviet Union also successfully returned lunar samples using the robotic *Luna-20* mission, the U.S.S.R.'s first of three sample return missions. Similar to U.S. practice, these samples were studied by the Soviet Union and distributed to other states for scientific study.⁶⁹ Significantly, the United States and the U.S.S.R. exchanged lunar samples as a way to mark an expansion of cooperation between the two states.⁷⁰ The U.S. representative in this exchange stated that, “[a]lthough

⁶⁵ *Status of International Agreements Relating to Activities in Outer Space as at 1 January 2017*, U.N. Doc. A/AC.105/C.2/2017/CRP.7 (Mar. 28, 2017).

⁶⁶ See George A. Coddling Jr., *The International Telecommunications Union: 130 Years of Telecommunications Regulation*, 23 DENV. J. INT'L L. & POL'Y 501, 508 (1994).

⁶⁷ Sarah Coffey, *Establishing a Legal Framework for Property Rights to Natural Resources in Outer Space*, 41 CASE W. RES. J. INT'L L. 119, 126 (2009) (pointing out that “over six missions *Apollo* returned 842 lbs. of material”).

⁶⁸ *Apollo 11 General Declaration*, U.S. CUSTOMS AND BORDER PATROL (July 24, 1969), <https://perma.cc/K589-ZDKE>.

⁶⁹ See *Apollo Sample Catalogues*, LUNAR AND PLANETARY INST. (Dec. 3, 1978), <https://perma.cc/9EQ5-4K8C>.

⁷⁰ *U.S. and Soviet Exchange Lunar Soil to Mark Pact*, N.Y. TIMES (June 11, 1971), <https://perma.cc/JQY4-GSG8>.

the quantity of material is small . . . its significance is very great.”⁷¹ Unlike the *Apollo* samples, Soviet lunar samples have been offered for sale on the private market. In 1993, 0.2 grams of the *Luna-16* lunar sample was sold by the Soviet government through the auction house Sotheby’s.⁷²

Finally, in 2003 Japan launched its *Hayabusa* mission. This mission flew to a near-Earth asteroid, collected samples, and returned to the surface of the Earth in 2010.⁷³ There were many issues with this mission and the sample return was not as robust as expected, but Japan confirmed that particulate matter from the asteroid was returned by the craft. The Japanese Space Agency (JAXA) administers these samples for scientific research, and requires that any samples delivered for this purpose be returned to JAXA.⁷⁴ JAXA makes clear through its frequently asked questions, the ownership of these samples is not transferred by virtue of a project being selected to do research:

Q6. Will I own distributed samples?

A6. Definitely NO. Samples belong to JAXA. Allocated sample must be returned to the Curator as soon as the proposed investigation is completed. Exceptions are those investigations that consume samples, but this fact needs to be mentioned clearly in the proposal.⁷⁵

Japan has not distributed these samples widely, likely based on the small amount that was collected, but it has partnered with NASA and transferred some of the particle samples to NASA for research.⁷⁶

Three important aspects of state practice in regards to samples from celestial bodies should be noted. The first is that no state has ever objected to another state engaging in a sample return mission, or challenged another state’s ability to effectively own and control these samples. Second, these samples may definitely be used in ways that provide a “benefit to all mankind.” These benefits can flow through scientific research or through gains in international peace and security through diplomatic uses. Finally,

⁷¹ *Id.*

⁷² Mike Bosworth, *What Has Happened to NASA’s Missing Rocks?*, BBC (Feb. 20, 2012), <https://perma.cc/9JBF-2SPZ>; see, e.g., Douglas Martin, *Space Artifacts of Soviets Soar at a \$7 Million Auction*, N.Y. TIMES (Dec. 12, 1993), <https://perma.cc/M733-LAR8> (commenting that interestingly, this same auction saw the Soviet government sell title to a lunar rover that was still on the surface of the Moon.).

⁷³ *Hayabusa Asteroid Itokawa Samples*, NASA, <https://perma.cc/4B4L-AZTV> (last visited Oct. 27, 2017).

⁷⁴ *Terms and Conditions for the International Announcement of Opportunity for Hayabusa Sample Investigation*, JAXA <https://perma.cc/J2H6-T9MV> (last visited Sept. 7, 2019).

⁷⁵ FAQs, JAXA, <https://perma.cc/4T6R-Z953> (last visited Sept. 7, 2019).

⁷⁶ *Hayabusa Sample Investigator’s Guidebook: For the International Announcement of Opportunity*, JAXA (May 8, 2017), <https://perma.cc/4PQ8-JBEL>.

there is at least one example of state practice in which a state has used a sample for commercial gain. As a result, we can say that state practice clearly indicates that Article II does not prohibit states from extracting material from celestial bodies, and that states seem to have some set of rights to dispose of that material as they see fit.

B. *Private Claims to Celestial Bodies*

There have been numerous attempts by individuals and commercial entities to claim all or part of particular celestial bodies as real property. Most of these attempts have been little more than publicity stunts, but many have sought to employ clever mechanisms to assert these rights by getting a state to somehow endorse the claims. These claimants usually argue that though Article II bars states from claiming territory, it does not bar a private individual from owning territory. This argument is rooted in a Lockean conception of property as a human right that exists as a function of natural law rather than domestic state governance. Interestingly though, the tactics of these claimants make explicit the role of the positive local law of the state as the arbiter of what can and cannot be private property. This puts their natural law claims into an untenable feedback loop that requires positive law to establish property rights.

There are several such examples of these attempts. One of the most prominent is Dennis Hope's Lunar Embassy, which claims to sell plots on the Moon and other celestial bodies to its customers. The Lunar Embassy web page claims that it is "the only company on Earth with the legal right to sell land in outer space period."⁷⁷ This legal right is based on fairly dubious ground. According to the Lunar Embassy:

Well, in 1980, a very bright, young and handsome Mr. Dennis Hope, went to his local US Governmental Office for claim registries, the San Francisco County Seat, and made a claim for the entire lunar surface, as well as the surface of all the other eight planets of our solar system and their moons (except Earth and the sun). Obviously, he was at first taken for a crackpot, until, 3 supervisors, 2 Floors and 5 hours later, the main supervisor accepted, and registered his claim.⁷⁸

There is not any additional information as to what specific type of claim is registered, but what can be gathered from this statement is that Hope bases the validity of his claim on the basis of its registration by a municipal bureaucrat, which he argues rises to the level of state recognition. Further, Hope sent letters to the U.S.S.R. and the UN

⁷⁷ Dennis M. Hope, *What's It All About?*, LUNAR EMBASSY, <https://perma.cc/J6GJ-KQ9K> (last visited Sept. 7, 2019).

⁷⁸ Dennis M. Hope, *Frequently Asked Questions*, LUNAR EMBASSY, <https://perma.cc/54TN-HZWD> (last visited Aug. 13, 2018).

registering his claim and his intent to own these surfaces. Hope's letters never received formal responses, and therefore he operates as if they are uncontested. It should be noted that the Chinese government has blocked the company from operating in China on the basis that it is fraudulent.⁷⁹

A second case is that of *Nemitz v. United States*. Nemitz, the plaintiff in this case, filed a security interest, under the California Uniform Commercial Code, in the asteroid Eros. Then, when NASA landed a probe on the asteroid, Nemitz sent NASA a bill for parking asserting that the security interest gave him property rights in the asteroid. The bill itself was minimal, but Nemitz's goal was recognition rather than riches.⁸⁰ NASA refused to recognize the claim by Nemitz, and eventually the matter was referred to the State Department.⁸¹ The State Department denied Nemitz's claim based on Article II, stating "In the view of the Department, private ownership of an asteroid is precluded by Article II 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. Accordingly, we have concluded that your claim is without legal basis."⁸² Nemitz then filed suit in the US District Court for the District of Nevada. This claim was dismissed by the court for failure to state a claim. Specifically, the Court stated that registration of a security interest does not create "property interests."⁸³ Nemitz appealed to the 9th Circuit, which upheld the lower court without a written opinion.⁸⁴

There are other such examples of these types of claims. For instance, in the early 1980s Lamar Savings and Loan Association "filed a request with the Texas savings and loan commissioner to acquire permission to open a branch office on the Moon."⁸⁵ This request would ultimately be rejected. While all of these claims tend to philosophically support the idea of property as a fundamental human right, they all in some way attempt to get the claims recognized by the government through the use of local rules. This reveals the thinness of appeals to natural law for the establishment of such claims, in that each claimant recognizes the need for positive legal recognition to vindicate their claims. Indeed, the central problem with using these cases as precedent, either for or against property rights, is that

⁷⁹ *Chinese Lunar Land Sale a Great Idea but Illegal Says Government*, SPACE DAILY (Dec. 7, 2005), <https://perma.cc/XU4E-RYMD>.

⁸⁰ See generally, *The Eros Project for Space Property Law*, EROS PROJECT, <https://perma.cc/A6SP-NT8M> (last visited Sept. 7, 2019).

⁸¹ See Kelly, *supra* note 32, at 298.

⁸² *OrbDev Appeals to State Dept. For Eros Rent Ruling*, SPACE DAILY (Aug. 28, 2003), <https://perma.cc/PVA8-HNM2>.

⁸³ Order Granting Defs. Mot. to Dismiss, 2, April 27, 2004, CV-N-03-0599-HDM(RAM).

⁸⁴ *Appellate Court*, EROS PROJECT, <https://perma.cc/UV8H-E5WB> (last visited Sept. 6, 2019).

⁸⁵ NATHAN C. GOLDMAN, *AMERICAN SPACE LAW: INTERNATIONAL AND DOMESTIC* 142-43 (2d ed. 1988).

these claimants universally lack any sort of possession, which the Nemitz court found to be dispositive. To circumvent the possession issue, another would-be claimant has been shooting a laser beam at Mars for years. He argues that this could give him a “legitimate claim” to the Martian surface based on the physical contact of the laser beam with Mars, which is cast as Lockean labor that adds value to the Martian surface by helping to spark the terraforming process.⁸⁶ What all of these claims lack though, is a clear nexus between the *lex loci* being used to justify the claim and the celestial body being claimed. This is clearly an issue of sovereignty. Recognition that someone has made a claim through procedural registration with a governmental body is quite different from a governmental body having territorial jurisdiction over that body, which is a necessary precursor to granting real property rights.

C. Private Ownership of Celestial Material

While both NASA and JAXA claim sole ownership of their extraterrestrial samples, there are several cases in which samples have entered into private hands, including the Soviet sale mentioned above. This has not yet been the case with any of JAXA’s samples, but NASA has numerous samples of which the whereabouts are unknown. Many of the lost Moon rocks are diplomatic gifts that the United States sent to world leaders.⁸⁷ Interestingly, NASA has aggressively pursued claims of ownership when it finds private parties in possession of lunar samples. Recently, for example, a NASA investigator was subjected to a lawsuit over a sting operation in which he detained and interrogated a 74-year-old widow of a NASA engineer for suspected theft of stolen property.⁸⁸

There are two important U.S. cases on whether individuals can own and sell lunar samples that are from the U.S. *Apollo* missions, over which NASA maintains that it has title. The first case is *United States v. One Lucite Ball Containing Lunar Material*.⁸⁹ In this case, a U.S. citizen travelled to Honduras and purchased one of the diplomatic gifts made from *Apollo* lunar samples. The gift was a plaque with the lunar sample inside a lucite ball and the flag of Honduras. It was being offered for sale by a Honduran

⁸⁶ FAQ: *Frequently Asked Questions . . . and More*, MARS FOR SALE, <https://perma.cc/TL3Y-KYGS> (last visited Nov. 5, 2017) (stating that claimant is using his sale of Mars to build support for ensuring the future usefulness of the Outer Space Treaty); Nick Whigham, *Can One Man’s Strange Claim to Ownership of Land on Mars Revamp International Space Law?*, NEWS LIMITED (July 18, 2017, 1:12 PM), <https://perma.cc/3N7S-SDVY>.

⁸⁷ Mark Bosworth, *What Has Happened to Nasa’s Missing Moon Rocks?*, BBC, (Feb. 20, 2012), <https://perma.cc/Q4VD-QJK9>.

⁸⁸ Fred Bardbash, *NASA ‘Sting’ Operation Against 74-year-old Widow of Apollo Engineer Draws Court Rebuke*, WASH. POST (Apr. 14, 2017), <https://perma.cc/LTV9-R8WS?type=image>.

⁸⁹ *United States v. One Lucite Ball*, 252 F. Supp. 2d 1367, 1372 (S.D. Fla. 2003).

general. The purchaser then sought to sell the sample to an undercover NASA investigator and the sample was subsequently seized. In the aftermath, the Honduran government requested the return of the sample asserting ownership rights. The court held that “[w]hen President Lopez Arellano accepted the gift on behalf of the Honduran government and people and placed it in the Presidential Palace, the lunar rock and plaque became part of the patrimony of the Republic of Honduras.”⁹⁰ The court goes on to apply Honduran law and concludes that neither the seller nor the buyer in this case could have gained good title since the Honduran government never authorized the transfer of the sample. The court does not reach the question of whether a purchaser with good title could then own the sample. However, this decision does indicate that the transfer of title to Honduras means that such a sale would be governed by the *lex loci*, which could allow for such a transfer.

The second case of interest is the recent *United States v. Ary*.⁹¹ In this case, Nancy Carlson was a private citizen who bought a lunar sample return bag through a United States forfeiture proceeding.⁹² The bag was previously stolen from a museum and, after three years, was mistakenly auctioned off with other property confiscated by the U.S. Marshall Service. The Plaintiff then had the bag tested, which revealed that it did indeed contain particulate lunar material. NASA then moved to set aside the original forfeiture sale of the bag, claiming that the bag was sold in error and that NASA was not notified of the sale.⁹³ It argued that “NASA’s policy and practice is not to transfer ownership of lunar material to any private individual.”⁹⁴ The Plaintiff argued that NASA had been involved in the forfeiture proceedings and at the least had constructive notice of the sale, and that title to the bag vested in the U.S. Government, rather than NASA specifically, and therefore the sale was a proper transfer of title.⁹⁵ The court concluded that while NASA lacked notice, it had no remedy against the Plaintiff as a bona fide purchaser:

By statute, the interest of a former owner is declared to be extinguished upon forfeiture, as the lack of a timely petition in the forfeiture proceeding means that “the United States shall have clear title to property that is the subject of the order of forfeiture and may warrant good title to any subsequent purchaser or transferee.” 21 U.S.C. § 853(n)(6). Under this provision, legal title to the bag passed to the United States. Title was subsequently conveyed to Ms. Carlson upon completion of

⁹⁰ *Id.* at 1373.

⁹¹ *United States v. Ary*, 224 F.Supp.3d 1186, 1186 (D. Kan. 2016).

⁹² *Id.* at 1190.

⁹³ *Id.* at 1190–91.

⁹⁴ *Id.* at 1190.

⁹⁵ *Id.* at 1190–91.

the auction sale.⁹⁶

According to the court, to the extent that NASA was deprived of its property through lack of notice, its remedy was against the United States directly. While the lunar material was not at the heart of the court's decision in this case, it does indicate that the United States is authorized to sell this material, which is consistent with the Soviet sale of lunar material. Again, it should be noted that the court applies the *lex loci* in making its decision on the transfer of title.

While these decisions are not conclusive on the notion of private ownership of extracted extraterrestrial material, they both indicate that the state has the ability to dispose of such material through a commercial sale, and that the subsequent private ownership can be legal depending on the local law of the state.

III. New Local Rules

This array of state practice brings us back to the inherent ambiguity of the Outer Space Treaty. If space is to be "used" under Article I, and states can authorize "nongovernmental" actors under Article VI, but they cannot claim space and other celestial bodies as territory, then the question remains whether commercial exploitation of resources is possible under the Outer Space Treaty. Indeed, it is exactly this ambiguity that the failed Moon Agreement attempted to clarify by providing for an international system to govern resource extraction.⁹⁷ Interestingly, one of the things that led to the failure of the Moon Agreement was opposition within the U.S. by "advocates of free enterprise in space" who "argued that the treaty would increase the entrepreneur's estimate of risk and stifle investment and development in space."⁹⁸ However, thirty years later, advocates of free enterprise have begun to advocate for clear rules governing resource extraction. To date, two states, the United States and Luxembourg, have responded to this new call for regulatory certainty.

Before looking at those rules, let us first engage with a quick recap of how property rights fit into the international legal system. As argued in Section II, Article II is primarily about the concept of territory and fitting a new spatial reality, i.e. human space exploration, into the freshly established international law system and its imagined geography or world-scale order.⁹⁹ While the international law system established after WWII does recognize "the right to own property alone as well as in association

⁹⁶ *Id.* at 1193.

⁹⁷ See Agreement Governing the Activities of States on the Moon and Other Celestial Bodies art. 11, July 11, 1984, 18 I.L.M. 1434 (explaining the Moon Agreement has entered into force, it has a low number of ratifications and none from major space powers).

⁹⁸ GOLDMAN, *supra* note 66, at 26.

⁹⁹ See Outer Space Treaty, *supra* note 16.

with others,”¹⁰⁰ this right, like most other human rights, is subject to local governance within a territory.¹⁰¹ The right to own property then changes as one crosses borders and enters new political and legal systems.¹⁰² This is an important feature within the international legal system because it made it possible for states with divergent ideologies to come together as sovereign equals.¹⁰³ Territory is absolute, but property is subject to local rules rather than international rules.¹⁰⁴ Indeed, the state practice above, and in particular the *One Lucite Ball* case, places *lex loci* rules as primary in making determinations about property.¹⁰⁵ In order for local rules to be applied, there needs to be some nexus between the territory in which those rules govern and the property at question.¹⁰⁶ As a result, claims over real property in outer space lack true ratification by governments, because they exist outside the territorial jurisdiction of the state; whereas, claims over extraterrestrial material that has been transported into the territory of the state, thereby creating a nexus, will be resolved through local rules.¹⁰⁷

Currently, multiple commercial entities are attempting to raise the necessary capital to engage in transportation to and mining of celestial bodies.¹⁰⁸ These initiatives are high risk for investors and potentially offer a high return on the investment, but in light of Article II some investors are reluctant to put their money in these ventures without some clarity as to whether that investment will be protected legally.¹⁰⁹ In other words, investors are concerned with whether these companies can own and therefore dispose of the resources they extract under the *lex loci*.¹¹⁰ Both the United States and Luxembourg have passed legislation that is intended to make these investors feel secure in the legal rights to the extracted resources.¹¹¹

¹⁰⁰ Universal Declaration of Human Rights, art. 17, Dec. 10, 1948, <https://perma.cc/LXH2-4ZGC>.

¹⁰¹ See United Nations General Assembly, *Role of Local Government in the Promotion and Protection of Human Rights – Final Report of the Human Rights Council Advisory Committee, Thirtieth Session, Before the Human Rights Council, HRC 30/49, 3, 7–9* (2015).

¹⁰² See generally MICHELE GRAZIADEI & LIONEL SMITH, *COMPARATIVE PROPERTY LAW* 193–95 (2017).

¹⁰³ See Peter Rutledge, *Toward a Functional Approach to Sovereign Equality*, 53 VA. J. INT’L L. 181, 186 (2012).

¹⁰⁴ See generally GRAZIADEI & SMITH, *supra* note 102, at 193–95.

¹⁰⁵ *United States v. One Lucite Ball*, 252 F. Supp. 2d 1367, 1372 (S.D. Fla. 2003).

¹⁰⁶ See *id.*

¹⁰⁷ See *id.*

¹⁰⁸ Benjamin Sutherland, *Space Exploration Will Open Up in 2018*, STEEMIT, <https://perma.cc/YGC3-GXNU> (last visited Sept. 7, 2019).

¹⁰⁹ See generally *Outer Space Treaty*, *supra* note 16, art. II.

¹¹⁰ See *Outer Space Treaty*, *supra* note 16, art. II.

¹¹¹ See generally U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114–90,

The United States passed the first of these laws in December 2015 as part of the Commercial Space Flight Competitiveness Act.¹¹² Title IV of this legislation states that

A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.¹¹³

The law further states that “the United States does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body,” thereby disclaiming such exploitation as an appropriation inconsistent with Article II.¹¹⁴

Luxembourg, as part of a strategy to attract the space industry to its territory, followed suit passing a law in summer 2017.¹¹⁵ This law states that “Les ressources de l’espace sont susceptibles d’appropriation.”¹¹⁶ The law then goes on to say that such appropriation must comply with Luxembourg’s international obligations: “L’exploitant agréé ne peut exercer l’activité visée au paragraphe 1 er qu’en conformité avec les conditions de son agrément et les obligations internationales du Luxembourg.”¹¹⁷ While the Luxembourg legislation does use the word “appropriation” to describe the act that it is making legal, it also uses a disclaimer about the international obligations of the state.¹¹⁸ The Luxembourg law goes further than the U.S. law in that the bulk of its text describes the nature of the authorization that Luxembourg will grant for these activities.¹¹⁹

129 Stat. 704, (2015); *Loi du 20 juillet 2017 sur l’exploration et l’utilisation des ressources de l’espace*, art. 1, LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUX., <https://perma.cc/558C-FH2N> (last visited Sept. 7 2019).

¹¹² See generally U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114–90, 129 Stat. 704, (2015).

¹¹³ *Id.* at 721.

¹¹⁴ *Id.* at 722.

¹¹⁵ Laurent Shummer & Blazej Gladysz, *Luxembourg Law on the Exploration and Use of Space Resources Entered Into Force*, ARENDT (Aug. 2, 2017), <https://perma.cc/BJ3B-5LSU>.

¹¹⁶ *Loi du 20 juillet 2017 sur l’exploration et l’utilisation des ressources de l’espace*, art. 1, LE GOUVERNEMENT DU GRAND-DUCHÉ DE LUX., <https://perma.cc/558C-FH2N> (last visited Sept. 6, 2018) (translating to “space resources are capable of being appropriated”).

¹¹⁷ *Id.* art. 2(3) (translated to “the authorised operator may only carry out the activity referred to in paragraph 1 in accordance with the conditions of the authorisation and the international obligations of Luxembourg”).

¹¹⁸ Gov’t of the Grand Duchy of Lux., *Draft Law on the Exploration and Use of Space Resources*, SPACERESOURCES.LU, <https://perma.cc/XU9F-HFRM> (last visited Sept. 7, 2019).

¹¹⁹ Compare, Gen. Assemb. Res. 1721, U.N. GAOR, 16th Sess., Supp. 17, at 6, U.N. Doc.

What is significant about both of these laws is that they are narrowly tailored to only grant rights to the extracted resources.¹²⁰ Neither law implies that a commercial entity will gain rights similar to “real property” rights in the area of their extraction operations, because real property is directly correlated to the territory in which it sits.¹²¹ Indeed, both laws explicitly note that the international obligations of the state will be a limitation on an entity’s ability to claim the property rights over the extracted resources, though the U.S. articulation of this principle is much stronger.¹²² These laws create a nexus between the state and the chattel property in question through personal jurisdiction rather than territorial jurisdiction.¹²³ The U.S. law applies to U.S. citizens and the Luxembourg law applies to entities authorized by the state.¹²⁴ This allows the two states to avoid the restrictions of Article II by not asserting their jurisdiction in such a way that implies sovereignty over the area of a celestial body, while at the same time confirming that a state may authorize a non-governmental entity to use space in accordance with Articles I and VI of the Outer Space Treaty.

These laws have stirred much debate among academics as to their legality under the Outer Space Treaty.¹²⁵ Despite the criticism, there is growing consensus that these laws represent, at a minimum, valid possible interpretations of Article II obligations.¹²⁶ In fact, such an interpretation is consistent with the Russian sale of Lunar material, as well as the recognition in *One Lucite Ball* that the *lex loci* applies to the disposal of tangible property.¹²⁷ Whether or not these interpretations become an internationally accepted standard is yet to be seen, but surely more states

A/RES/1721(XVI) (1961), with U.S. Space Exploration Policy, Exec. Directive No. 31, N.S.P.D. (Jan. 14, 2004).

¹²⁰ See U.S. Space Exploration Policy, Exec. Directive No. 31, N.S.P.D. (Jan. 14, 2004).

¹²¹ *Id.*

¹²² *Id.*

¹²³ See generally P. J. Blount, *Jurisdiction in Outer Space: Challenges of Private Individuals in Space*, 33 J. SPACE L. 299 (2007); Frans von der Dunk, *Effective Exercise of ‘In-space Jurisdiction’: The US Approach and the Problems it is Facing*, 40 J. SPACE L. 147 (2015) (discussing jurisdiction in outer space).

¹²⁴ See U.S. Space Exploration Policy, Exec. Directive No. 31, N.S.P.D. (Jan. 14, 2004).

¹²⁵ Blount and Robison, *supra* note 10, at 161–62; Thierry Labro, *Luxembourg Space Exploration Laws Criticised*, LUX. TIMES (Barbara Tasch, trans. Aug. 2, 2017), <https://perma.cc/F6XM-ZCEZ>.

¹²⁶ See *Position Paper on Space Resource Mining*, INT’L INST. OF SPACE LAW, 1–3 (Dec. 20, 2015), <https://perma.cc/JUQ3-QXK9>.

¹²⁷ See generally *U.S. v. One Lucite Ball Containing Lunar Material*, 252 F.Supp.2d 1367 (S.D. Fla. 2003) (holding the government’s evidence established probable cause that the moon rock and display plaque were stolen from the Republic of Honduras and then introduced into the United States).

will begin to pass laws on space resources.¹²⁸

If international consensus supports that states may authorize non-governmental entities, then numerous challenges are on the horizon.¹²⁹ This is especially so in light of the rudimentary nature of these laws.¹³⁰ The U.S. law is devoid of any details on authorization or safety for these entities, and while the Luxembourgish law addresses authorization, it is more concerned with the financial solvency of the authorized entity rather than details about how such activities shall be carried out.¹³¹ While entities will likely be controlled by local rules rather than international rules, the idea of international coordination for safety is one that states should begin to take quite seriously.¹³² One of the central goals of the Outer Space Treaty is to avoid conflict through the facilitation of communication and coordination among states to lessen the risk of accidents or conflicts in space.¹³³ Article VI requires that states keep close tabs on their non-governmental actors due to the strategic nature of the space environment.¹³⁴ While the commercial exploitation of space should not be unnecessarily hampered, it is important to remember that commercial exploitation is not a primary goal of the treaty regime, which is squarely focused on international peace and security.¹³⁵ As a result, states should be aware of the risk of a “race to the bottom” in the enactment of such laws, similar to the flags of convenience problem on the high seas.¹³⁶ Safety, security, and sustainability for all space actors are all critical notions that states should give serious thought to when enacting local rules.¹³⁷

In order to preserve space for peaceful purposes as new space activities emerge, states will need to establish mechanisms to ensure that risk of harmful interference is minimized.¹³⁸ Indeed, there is precedent for such

¹²⁸ See generally *id.*

¹²⁹ See Labro, *supra* note 125.

¹³⁰ See Labro, *supra* note 125.

¹³¹ *A Legal Framework for Space Exploration*, GRAND DUCHY OF LUX., (July 13, 2017), <https://perma.cc/286V-D9EX>.

¹³² See *Luxembourg Set to Become Europe's Commercial Space Exploration Hub with New Space Law*, OGIER, (Aug. 3, 2017), <https://perma.cc/U9CR-9D6E>.

¹³³ See Blount, *supra* note 123, at 310.

¹³⁴ Outer Space Treaty, *supra* note 16.

¹³⁵ Outer Space Treaty, *supra* note 16.

¹³⁶ See *Luxembourg Set to Become Europe's Commercial Space Exploration Hub with New Space Law*, *supra* note 132.

¹³⁷ See *Luxembourg Set to Become Europe's Commercial Space Exploration Hub with New Space Law*, *supra* note 132.

¹³⁸ See *Sharing the Sky – ITU's Role in Managing Satellite and Orbit Spectrum Resources*, INT'L TELECOMM. UNION, <https://perma.cc/9UKU-7AX9> (last visited Sept. 7, 2019) [hereinafter *Sharing the Sky*].

mechanisms in the ITU management of the geosynchronous orbit (GEO).¹³⁹ This system is not a full blown legal system, but it has provided a reliable mechanism for states to give notice of their activities in GEO.¹⁴⁰ This regime does not provide “rights” to the orbit, but instead gives states the ability to make a planned use known to the international community so that other states can plan their space activities accordingly.¹⁴¹ While a regime such as that found in the Moon Agreement is politically untenable at this time, a system that allows states to coordinate based on notice and registration could be an effective way to ensure that space remains conflict free.¹⁴²

CONCLUSION: SPACE FOR THE BENEFIT OF ALL

One of the core values embedded in the international space law regime is that states should ensure that space is used for the benefit of all. While this value likely rises to the level of customary international law, it is an amorphous obligation that is an aspirational value rather than a hard legal obligation. The principle, however, should not be minimized as new space activities, including space resource extraction, emerge. Rather, states should continue to ensure that even commercial uses of space provide benefits to the global population. Commercial entities should not be prohibited from making a profit from the use and exploration of space, but the space regime treats space as a very different sort of place than those found terrestrially. It would be folly to swing the pendulum too far in favor of commercial profit. This could allow private entities to destabilize the strategic space environment, which would destabilize the terrestrial security environment. The result would be a use of space for the detriment of all humankind.

This is not to say that there is a need to go as far as equitable sharing of profits from resources as envisioned in the Moon Agreement. While that would certainly be one way to accomplish using space for the benefit of all, it is one that might overly hinder commercial exploitation and the failure of the Moon Agreement shows that there is no political will to establish such a system. Through the Outer Space Treaty, states have agreed to hold themselves to a higher standard than they do terrestrially in order to serve the entire human population. In the adoption of local rules for new space activities, states have a moral and legal obligation to hold their nongovernmental actors to similar standards. While Article VI makes clear

¹³⁹ See Guilnem Penent, *Governing the Geostationary Orbit: Orbital Slots and Spectrum Use in an Era of Interference*, IFRI (Jan. 20, 2014), <https://perma.cc/XRM8-SCYB>.

¹⁴⁰ See *Sharing the Sky*, *supra* note 138.

¹⁴¹ See *Sharing the Sky*, *supra* note 138.

¹⁴² See *Sharing the Sky* *supra* note 138.

that states may authorize the use of space by non-governmental actors, that use is still governed by Article I, which requires the use to be “for the benefit of all countries.” As resource extraction develops, Article II and the question of property rights does not pose the biggest challenge. Instead, the biggest challenge is avoiding a profit driven race to the bottom which would gut the underlying values on which the international community based the space regime.