

The Paradox of United States' Position on Regulation of Space Resource Extraction

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Abstract

Title IV of the *United States Commercial Space Launch Competitiveness Act* (“Space Resource Exploration and Utilization Act of 2015”) signed into law on November 25, 2015 is only the beginning of emerging national legislation to authorize and supervise commercial activities of private companies who seek to extract resources from near-Earth asteroids and the Moon. Sponsors of the Act, which is comprised of a mere three provisions followed by a disclaimer of any intent to assert sovereignty over celestial bodies, publicly acknowledge this is a work in progress, especially as it concerns mission authorization. The Act pointedly requires a report on recommendations for the allocation of responsibilities among Federal agencies for commercial exploration and recovery of space resources, recognizing the ongoing concern of identifying the correct governmental agency or division ultimately responsible to supervise these activities. Notwithstanding the ambiguity, it is clear the United States will not be held back from forging its way through virgin territory to regulate off-world resources. The official position of sponsors of the Act is that it does not support the creation of an international body to establish rules and regulation over space resource mining because to do so would be counter-productive, undermining U.S. national interests and dis-incentivizing private sector investments. The ostensible purpose to allow state domestic law and customary practice to develop without proscribing international rules begs the question of what import (if any) is to be given the Moon Agreement. Whether the current congressional sponsors wish to acknowledge it or not, their government has played a significant role in voicing the international community’s *opinio juris* on how a framework regulating that activity should evolve. This paper will discuss this paradoxical position and what rational avenues exist to reconcile international law on regulation of space mining ventures.

1. Introduction

Contemplating a mining industry in outer space implicates a considerable range of legal rights and policy issues that are not necessarily established,

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firm or predictable. A number of principles established through the progressive development and codification of international law by the United Nations *appear* to provide certain guidance. For example, it is commonly presumed that outer space is free for use by all States, that the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and that no one may appropriate outer space or the celestial bodies for their own purposes. However, even these solemn principles are subject to division of opinion in their application.

When international treaties are ambiguous about whether a space activity is permissible, States interested in encouraging their domestic commercial space industries to enter the field may either wait for certainty, when consensus and agreement are reached among all government diplomats, space agencies, academics and entrepreneurs, or take a risk and enact legislation within a limited jurisdictional sphere which establishes the parameters of conduct in a manner consistent with the most widely accepted view. The latter path was chosen by the United States when it enacted Title IV of the *United States Commercial Space Launch Competitiveness Act* (the “Space Resources Act”) last November, 2015.¹

International space lawmaking has been largely a United Nations (UN) enterprise that, due to its consensus process, is slow and cumbersome. The increasing number of countries with practical interests in space increases the difficulty in reaching agreement. Today there are over fifty countries with space interests large enough to justify national space agencies that operate in an industry significantly more sophisticated and diverse than the one dominated by only two space powers in the 1960s and 1970s. Today, obtaining universal consensus on sensitive issues such as property rights in space is not a realistic.

Indeed, that lack of consensus is what we are seeing now in response to the new Space Resources Act. This should surprise no one, except perhaps the unsuspecting American public who are hearing for the first time that their country has passed a law that violates fundamental principles of international law.² The space law community has heard these objections before and they

1 Title 51, United States Code, Subtitle V, Chapter 513, sections 401-403. The Act has four subtitles: Title I, “Spurring Private Aerospace Competitiveness and Entrepreneurship” (SPACE) amends the Commercial Space Launch Act; Title II amends the Land Remote Sensing Policy Act; Title III re-labels the Office of Space Commerce and rephrases its purposes, and Title IV, the “Space Resource Exploration and Utilization Act” (the Space Resource Act), provides provisions for space resource utilization. See <https://www.congress.gov/bill/114th-congress/house-bill/2262/text>.

2 See, e.g., Pascual, K., U.S. Space Mining Law Is Potentially Dangerous And Illegal: How Asteroid Mining Act May Violate International Treaty, Tech Times (28 November 2015), available at <http://www.techtimes.com/articles/111534/20151128/u-s-space-mining-law-is-potentially-dangerous-and-illegal-how-asteroid-mining-act-may-violate-international-treaty.htm#sthash.QuFX3wlk.dpuf>, and Who owns space?

are nothing new, but how can the general public “consider the source” without delving into the esoteric domain of international space law?

Public understanding is further obscured by the history of the United States' reaction to the world's first attempt to establish rules pertaining to the use of extraterrestrial resources, the Moon Agreement. Leaving aside the merits and woes of the “common heritage of mankind” doctrine cited in the treaty that became the Tar-Baby responsible for its rejection in the United States,³ the eight years of discussion, negotiation and compromise that resulted in consensus in the UN seemingly evaporated in the white-hot heat of congressional hearings infected by the political influences and prejudices dominating unrelated treaties still under negotiation.⁴

No official position was ever taken on the validity of the Moon Treaty, though the United States has officially and explicitly recognized the binding nature of the other four space law treaties without mentioning its existence. Instead, the Moon Agreement came to be known as a treaty unable to provide the necessary legal environment to exploit lunar resources without undue risk.⁵

Today, the United States does not support the Moon Agreement's proposal to create an international regime to establish rules and regulations over space resource mining.⁶ Instead, it has taken the initiative to create a domestic framework from which it may build a future, more complete regulatory regime independent of any requirement to coax all other countries into agreement. Its critics argue that path is inconsistent with international law. Ironically, the Moon Agreement can come to the rescue.

US asteroid-mining act is dangerous and potentially illegal, *The Conversation* (November 25, 2015), available at <http://theconversation.com/who-owns-space-us-asteroid-mining-act-is-dangerous-and-potentially-illegal-51073>.

3 See, Gangale, T., *The Development of Outer Space: Sovereignty and Property Rights in International Space Law* at 67-80, 98-105 (2009).

4 It is no coincidence that the most vocal opponent of the Moon Agreement had led the United States delegation in negotiations on the UN Convention on the Law of the Sea, which became the battleground for the “common heritage of mankind” doctrine in the 1970s. See, Bin Cheng, *The Moon Treaty: Agreement Governing the Activities of States on the Moon and Other Celestial Bodies within the Solar System other than the Earth*, December 18, 1979, 18 *Annals Chinese Soc'y Int'l L.* 1, 17 (1981). See, Gangale, *supra* note 3, at 98-99.

5 See, Tronchetti, F., *The Commercial Exploitation of Natural Resources of the Moon and Other Celestial Bodies: What Role for the Moon Agreement?* 53 *Proc. Int'l Inst. Space L.* 614, 618 (2010).

6 See, e.g., Remarks of Kenneth Hodgkins, Director of Space and Advanced Technology, U.S. Department of State, Secure World Foundation and Alliance for Space Development Panel discussion on “Asteroids, Mining, and Policy: Practical Consideration of Space Resource Rights. Available at: <https://swfound.org/events/2016/asteroids-mining-and-policy-practical-consideration-of-space-resource-rights> (May 5, 2016) (Transcript link at bottom of page).

2. National Legislation

The Space Resource Act passed by the United States Congress less than a year ago is probably the only “law” pertaining to outer space resources of which the general public may be aware. That legislation is the first of its kind and it understandably goes out of its way to exclaim intended fidelity to international law.⁷ It is the inauguration of an inchoate national legal regime that attempts to codify property rights enshrined in international law and apply them on a domestic level, to its citizens.⁸ Of its three substantive provisions on space resource utilization, the second provides the following rights to those who aim to engage in exploitation of extraterrestrial resources:⁹

“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.”

This provision is arguably the natural product of the prevailing international view, which holds that States (and their private entities) may exploit and appropriate natural resources in space.¹⁰ As widely accepted as this view is, it has been debated by certain factions in the space law community for decades and thus, it cannot be said that the entire international community accepts it as an authoritative interpretation of law.¹¹

7 SEC. 403: “DISCLAIMER OF EXTRATERRITORIAL SOVEREIGNTY. It is the sense of Congress that by the enactment of this Act, the United States does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body.”

8 Under Article VI of the Outer Space Treaty, private activity is permitted in outer space on the condition that the appropriate State exercises authorization and continuing supervision over their activities in a manner that assures compliance with international law. Authorization is usually through establishment of a licensing system and supervision is accomplished through regulatory oversight after the license is issued. By passing national legislation in this way, States meet their obligations under international law. For further discussion and a review of national legislation, *see* Dempsey, P. S., National Laws Governing Commercial Space Activities: Legislation, Regulation, & Enforcement, 36 Nw. J. Int’l L. & Bus. 1 (2016).

9 Space Resource Act, section 51303.

10 *See, e.g.*, Tanja Masson-Zwaan and Bob Richards, Op-ed | International Perspectives on Space Resource Rights, Space News, December 8, 2015, available at: <http://space news.com/op-ed-international-perspectives-on-space-resource-rights/>.

11 Further Statement by the Board of Directors of the IISL on Claims to Lunar Property Rights (2009), <http://www.iislweb.org/docs/Statement%20BoD.pdf> (hereinafter, Further Statement, IISL).

The objections to the Space Resource Act form the vanguard for preservation of the developing countries' rights in space. While it is true that many experts have analyzed the legislation and cannot identify any breach of international obligations under the OST,¹² it must be said that opposition views certainly have popular appeal, which casts the legislation as an aggressive land-grab by a greedy first-world nation interested in its own best interests. While undoubtedly it is true that the United States furthers its own best interests – as does every State – it is not necessarily true that the legislation fails to honor the spirit as well as letter of international law and part of that defense owes its gratitude to the Moon Agreement.

3. International Law: The Space Treaties

The current legal framework of international space law is grounded in five multilateral space law treaties negotiated in the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), the primary forum for the development of international space law. Though these treaties do not stand alone as international law governing outer space, they do operate as the starting point of the discussion.

3.1. The Outer Space Treaty

The Outer Space Treaty¹³ is the foundation of space law. It has been signed by 103 States since its adoption in 1967 and is considered the constitution governing all activity in outer space. Its progeny, the Rescue Agreement,¹⁴ Liability Convention,¹⁵ Registration Convention¹⁶ and the Moon Agreement¹⁷ emanate from more general provisions found in its text. Two of its provisions – the freedom of all States to explore and use outer space for peaceful

12 See, Masson-Zwaan and Bob Richards, *supra* note 10. See also, Tronchetti, F., Title IV – Space Resource Exploration and Utilization of the US Commercial Space Launch Competitiveness Act: A Legal and Political Assessment, 41 Air & Space L. 143, 149 (2016); International Institute of Space Law (IISL) Position Paper On Space Resource Mining, Adopted by Board of Directors on 20 December 2015, <http://www.iislweb.org/docs/SpaceResourceMining.pdf>.

13 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, 610 U.N.T.S. 205 (1967) [Outer Space Treaty]. The first treaty to expressly regulate legal space activities was the Limited Test Ban Treaty of 1963.

14 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 672 U.N.T.S. 119 (1968) [Rescue Agreement].

15 Convention on International Liability Caused by Space Objects, 961 U.N.T.S. 2389 (1972) [Liability Convention].

16 Convention on the Registration of Objects Launched into Outer Space, 1023 U.N.T.S. 15 (1975) [Registration Convention].

17 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 1363 UNTS 3 (1979) [Moon Agreement].

purposes (Article I)¹⁸ and the non-appropriation of outer space (Article II)¹⁹ – are primary principles that frame the debate of property rights in space.²⁰

3.2. The Moon Agreement

The Outer Space Treaty contains generally applicable provisions that were never in themselves intended to establish the legal basis of property rights and responsibilities on the Moon; this was why the UN committee that negotiated it embarked on a lengthy process to establish its architecture, which ultimately became the Moon Agreement. Unlike the Outer Space Treaty, the Moon Agreement *does* have provisions specific to the Moon.²¹ Also unlike the Outer Space Treaty, it is binding on only the sixteen (16) States that have agreed to it to date. The United States, like most other spacefaring States, has not agreed to the Moon Agreement.²²

Regardless of whether a particular State is or is not bound by the Moon Agreement, its provisions and its very existence are important considerations in interpreting provisions in the Outer Space Treaty. Its primary architects, United States and the Soviet Union, aggressively negotiated its language for eight years and the positions accepted and rejected along the way to its adoption by the entire UN General Assembly in 1979 cannot be dismissed or ignored when interpreting the provisions of the treaty it sought to clarify. Its language is clear evidence of what the international community accepted as a permissible “free use” of celestial bodies and although many States did not ultimately ratify the Moon Agreement, they implicitly agreed that the language permitting the appropriation of resources was consistent with the intent of the Outer Space Treaty.²³

18 Articles I and IV, Outer Space Treaty.

19 Article II, Outer Space Treaty.

20 *See generally*, I.H.P.H. Diederiks-Verschoor and V. Kopal, *The Space Law Treaties, An Introduction to Space Law*, 3rd ed. 26-28 (2008).

21 *See*, Tennen, L., *Towards a New Regime for Exploitation of Outer Space Mineral Resources*, 88 *Neb. L. Rev.* 794, 812 (2009).

22 *See*, Status of International Agreements as of 1 January 2016 for current ratifications, available at: http://www.unoosa.org/documents/pdf/spacelaw/treatystatus/AC105_C2_2016_CRP03E.pdf. Though this is an oft-repeated derogation, it should be remembered that France and India are launching states and in any launch involving them involves the Moon Agreement.

23 For further analysis and information on the Moon Agreement, *see*, Gangale, *supra* note 3, at 33-154; Lyall, F., and Larsen, P., *Space law: A Treatise*, 175-197 (2009); Cheng, B., *Studies In International Space Law*, 357-380 (1997). *See also*, “Back in Business? The Moon Agreement, Private Actors and Possible Commercial Exploitation of the Moon and Its Natural Resources” (Workshop on Policy and Law Relating to Outer Space Resources, Institute of Air and Space Law, Session 5, McGill University, 2006) 243, 256, <http://www.mcgill.ca/iasl/publications/proceedings/>, (adapted as, *The Moon Agreement and the Prospect of Commercial Exploitation of Lunar Resources*, 32 *Ann of Air & Space L* 91 (2007)).

4. Property Rights in Outer Space

Property in outer space which may be the subject of claims of dominion can be subdivided generally into three categories: Territory, Resources and Objects.

4.1. Territory

Extraterrestrial real estate and, in a very literal sense “space” (the voids between celestial bodies) cannot be *owned* by anyone – whether State or private entity. The first two articles of the Outer Space Treaty make this clear. Article I stands for the proposition that outer space shall be free for exploration and use by all States without discrimination of any kind. It is Article I that provided the legal context for the United States and Soviet governments to land on the moon and return moon rocks in the 1960s and 1970s without international protest.²⁴ This freedom is, however, immediately constrained by Article II, which forbids their appropriation by anyone:²⁵

“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.”

Initially, it may appear that only States are not allowed to own territory in space, since Article II says celestial bodies are not subject to *national* appropriation, without mentioning *private* appropriation. However, that argument ignores other provisions that make it clear *both* government and private entities are barred from claiming ownership of territory in space.

First, Article II forbids any appropriation of territory “by claim of sovereignty, by means of use or occupation, or by any other means.” Although there are disagreements,²⁶ this prohibition encompasses ownership of territory by both governments and non-governments.²⁷ There can be no private ownership because recognition of such a right would presuppose the existence of a sovereign competent to confer and enforce a title.²⁸

Second, private space activities are limited to the scope permitted to States. A State is responsible for the actions of its nationals. Under Article VI,²⁹ States

24 See, Masson-Zwaan, *supra* note 10.

25 See, e.g., Tronchetti, *supra* note 5, at 615.

26 See, e.g., White, W., Real Property Rights in Outer Space, 40 Proc. Int'l Inst. Space L. 370 (1998).

27 See, Statement by the Board of Directors of the IISL On Claims to Property Rights Regarding The Moon and Other Celestial Bodies (2004) at http://www.iislweb.org/docs/IISL_Outer_Space_Treaty_Statement.pdf, and Further Statement, IISL, *supra* note 11.

28 It should come as no surprise that the United States denied George Nemitz recognition of his ownership of Asteroid 433 on Article II grounds. *Nemitz v. United States*, CV-N-03-0599-HDM-(RAM) (D. Nev. 2004).

29 Article VI provides (in part): “States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other

“bear international responsibility for national activities in outer space” and must make sure those activities comply with the treaty, including its nonappropriation provision.³⁰ Since a State can only authorize actions within its own power, it cannot license a private entity to engage in conduct prohibited to the State itself.³¹

Finally, Article I would be undermined if it were interpreted to permit private ownership and allow States to *circumvent* their treaty obligations by delegating authority to some private entity to do what it otherwise could not do.³²

4.2. Objects – Stations, Installations and Equipment

The category of “objects” includes anything launched into space. Objects are owned by the launching State that registers them. Rights over the space object are contemplated in the Outer Space Treaty, which provides in Article VIII that a State on whose registry an object launched into outer space is carried shall retain jurisdiction and control over it.

Objects, under the Outer Space Treaty, include things “constructed on a celestial body”³³ as well as “stations, installations, equipment and space vehicles” that occupy space on the celestial body.³⁴ As already discussed, the territory on which these objects sit cannot be owned. However, the State with jurisdiction and control over objects occupied by that territory clearly has control over what takes place on it and “potentially harmful interference” with those objects and their associated activity is not sanctioned by the Outer Space Treaty.³⁵

Thus, the law governing objects in space is an important aspect of property rights which, though not explored in the narrow context of this paper, may be significant in the future when mining “claims” become competitive. Latecomers may find that even though States arriving first in time do not have legal title to the territory, they may nevertheless exclude others from using as a practical matter.³⁶

celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities,”

30 See, Von der Dunk, F., Liability Versus Responsibility In Space Law: Misconception or Misconstruction? Proceedings of the Thirty-Fourth Colloquium on the Law of Outer Space 363, at 366-367 (1992). See also K.H. Böckstiegel, Reconsideration of the Legal Framework for Commercial Space Activities, 33 Proc. Int’l Inst. Space L. 3, 5 (1990); B. Cheng, *supra* note 23, at 300.

31 See, Tennen, *supra* note 21, at 806, citing Jenks, C., Space Law 201 (1965).

32 See, Statement By IISL Board of Directors, *supra* note 27. The Board of Directors reaffirmed the Statement in 2009. See *supra* note 11.

33 Article VIII, Outer Space Treaty.

34 Article XII, Outer Space Treaty.

35 Article IX, Outer Space Treaty.

36 Some experts consider the mere occupation of an area an appropriation because other entities are precluded from using that location. See, Tennen, *supra* note 21, at 811.

4.3. Natural Resources

The existence of a right to own natural resources in space is contested. Generally, the spacefaring states' position is that natural resources may be appropriated by a state or private entity; this is understandable, since the rewards resulting from that activity are within their grasp. Predictably, developing countries assert that any benefits derived from space must be shared among all countries; this, too is understandable, since it is clear that developed countries will likely to reap those rewards long before they can do so.³⁷

Both positions are grounded in the free use permitted under Article I of the Outer Space Treaty.³⁸ Developed States generally hold that free use includes resource removal (and there is nothing in the treaty that says it doesn't), while developing States insist that their removal comes with a caveat – that this use “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.” The latter position diverges generally into two schools of thought: (1) the first school holds that removal is exercise of dominion over the resource (part of the territory) to the exclusion of other States and is appropriation because by definition it cannot be in the benefit and interest of all countries³⁹ and (2) the second school holds that resource extraction is conditionally permitted only if it results in a benefit to all countries – the nature and scope of said “benefit” itself a subject of dispute.⁴⁰

This is obviously a meritorious debate, with able proponents on all sides. However, it must be said that the prevailing opinion, held by most space law experts, is that the free “use” of celestial bodies includes the practical applications of using the moon, including the extraction of its natural resources.⁴¹ Thus, it is widely (though not universally) accepted that commercial exploitation is lawful so long as it does not prevent any other entity from undertaking the same activity in space.⁴²

37 See, Larsen, Paul B., Asteroid Legal Regime: Time for a Change, 39 J. Space L. 275, 281-82 (2014).

38 See, generally, Sprankling, J.G., The International Law of Property at 185-89 (Oxford, 2014).

39 See, e.g., Nath, S., Bhattacharyya, S., Property Rights on Moon: The Principle of Nonappropriation and the Exploitation of Natural Resources of Moon, 53 Proc. Int'l Inst. Space L. 599, 610 (2010), citing Ogunbanwo, O., International law and outer space activities, Chapter IV (1975).

40 See, Tronchetti, F., The Moon Agreement In The 21st Century: Addressing Its Potential Role In The Era Of Commercial Exploitation Of The Natural Resources of The Moon and Other Celestial Bodies, 36 J. Space L. 489, 498 (2010). It is, however, generally understood that this is not a mandatory requirement. *Id.*, at 499.

41 See, e.g., Tennen, *supra* note 21, at 799.

42 See, Von der Dunk, *supra* note 23, at 253 (“Consequently, at the end of the day the provision regarding the “benefit and (...) interest of all countries” in the Outer Space Treaty should only be interpreted in a “negative” way. As long as a particular activity

It is important to note the explicit recognition in the Preamble to the Moon Agreement, which was adopted “bearing in mind the benefits which may be derived from the exploitation of the natural resources of the moon and other celestial bodies.” Clearly, resource exploitation was intended on some level. More specifically, the language in the Moon Agreement shows all States viewed the Moon’s extraterrestrial natural resources as property separate and apart from the territory from which they were taken, with distinct property rules applicable to each:

“Neither the surface nor the subsurface of the Moon, nor any part thereof or natural resources *in place*, shall become property of any State or natural person. The placement of personnel, space vehicles, equipment, facilities, stations and installations...shall not create a right of ownership over the surface or the subsurface of the Moon or any areas thereof.”⁴³

Thus, natural resources “in place” are still part of the territory and cannot be owned; but once the resource is removed and no longer “in place”, it may be extracted for non-scientific (i.e., commercial) purposes.⁴⁴ Notwithstanding that the Moon Agreement is not binding on most States, this provision shows that all States agreed that the freedom to “use” outer space, as expressed in the Outer Space Treaty, includes the exploitation and removal of resources.⁴⁵ Opponents, on the other hand, argue that such a construction could not have been intended because it would contradict the spirit and letter of the common heritage of mankind concept embraced in Article 11, paragraph 5.⁴⁶ Those who would condition the removal of resources on the provision of benefits to all other countries rely on the benefit sharing provisions in both agreements: The Outer Space Treaty, in Article I, provides that the use of outer space “shall be carried out for the benefit and in the interests of all countries. ...,” while the Moon Agreement, in Article 11, paragraph 7(d), provides that once States “undertake” to establish an international regime for

in outer space did not (significantly) harm another state, it would be allowable under the fundamental freedom of space activity. No “positive” material benefits accruing to other states were required to make any exploitation of outer space legal.”)

43 Article 11, paragraph 3, Moon Agreement.

44 See, Tennen, *supra* note 21, at 813; Lyall & Larsen, *supra* note 23, at 195; Doyle, S., Using Extraterrestrial Resources under the Moon Agreement of 1979, 26 J. Space L. 111, 121-22 (1998).

45 State practice has evolved to recognize property rights in extracted resources. For example, the United States brought back 842 pounds of lunar rocks from the Apollo missions. Some were later exchanged for Soviet Luna samples and some were subsequently resold to private individuals. No state objected to either the US or USSR claim of ownership, though it may be argued that these resources were originally removed for scientific purposes and on that ground their appropriation was independently permitted, regardless of what became of them.

46 See, Nath, *et al.*, *supra* note 39, at 610.

the exploitation of the natural resources, one of that regime's purposes will be

“[a]n equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries which have contributed either directly or indirectly to the exploration of the Moon, shall be given special consideration.”

But what is a suitable “benefit”? There are several perspectives on the issue.⁴⁷ Some oppose any commercial resource mining because it is by definition not for the “benefit of all” and violates the common heritage of mankind doctrine, while others might approve of the activity if it provides a community service to all states incidental to the for-profit activity. Still others might approve if the goods or services were simply made available to all on a non-discriminatory basis (e.g., the sale of remote sensing services.)⁴⁸

It should be understood at the outset that the “common heritage of mankind” doctrine in Article 11 of the Moon Agreement was explicitly confined to the meaning in Article 11, paragraph 5,⁴⁹ so that the prejudices surrounding its use in the UNCLOS negotiations would not become applicable to the new treaty. In any event, it is highly improbable that any obligatory benefit-sharing position will ever become customary international law.⁵⁰ This conclusion owes its confidence to the outcome of the international community's decades-long debate, captured in the Space Benefits Declaration in 1996, which establishes that the benefits to be shared are up to the mutual agreement of the States involved.⁵¹

This view of the declaration is reinforced by its negotiating history, which initially found developing countries advocating for a redistribution of

47 See, Lee, R., *Creating A Practical Legal Framework For The Commercial Exploitation Of Mineral Resources In Outer Space* 324-25 (2009).

48 *Id.*

49 Testimony of N. Hosenball, U.N. Doc. A/AC.105/PV (July 16, 1979) at 84, available at <https://ia800202.us.archive.org/29/items/internationalspa00unit/internationalspa00unit.pdf>.

50 Treaties bind only the parties that sign them. See Cheng, B., *Studies in International Space Law*, 1997, at 174-175 (“[I]n the making of rules of general international law, ... it is always the will of the *dominant* section that prevails.... Basically, the dominant section consists of those who have the *capability*, the *intention*, and the *determination* of making their will prevail. *Id.* at 183-184.

51 See, e.g., Hobe, S., *Adequacy of the Current Legal and Regulatory Framework Relating to the Extraction and Appropriation of Natural Resources*, Workshop on Adequacy of the Current Legal and Regulatory Framework, Institute of Air and Space Law, Session 4, McGill University, (2006), 203 at 211, retrieved from <http://www.mcgill.ca/iasl/publications/proceedings/>, *adapted*, 32 *Annals of Air and Space Law*, 115-130 (2007).

technologies in a way that gave them preferential treatment.⁵² They met significant resistance, especially to any “regime of forced cooperation” that might negate a State’s freedom to choose their cooperative partner,⁵³ and eventually softened their approach, partly in response to the argument that space-faring countries were already engaged in multilateral and bilateral space projects with developing nations and, ultimately, an influential working paper that emphasized that nations should be free to determine their level of cooperation and stressed that the manner of cooperation should be appropriate and efficient.⁵⁴ The States’ ultimate agreement was captured in the Space Benefits Declaration⁵⁵ and adopted by the United Nations General Assembly in 1996.

The Space Benefits Declaration is an authoritative interpretation⁵⁶ of Article I, which concludes that each State may determine the manner and extent of any “international cooperation” in the use of space. It provides, in Article 2:

“States are free to determine all aspects of their participation in international cooperation in the exploration and use of outer space on an equitable and mutually acceptable basis. Contractual terms in such cooperative ventures should be fair and reasonable and they should be in full compliance with the legitimate rights and interests of the parties concerned, as, for example, with intellectual property rights.”

Ultimately, an open market approach to trade in goods and services prevailed in defining their relations, much as it did in negotiations for the 1994 Amending Agreement to UNCLOS,⁵⁷ which foreclosed the mandatory

52 See, Carpanelli, E., Cohen, B., A Legal Assessment of the 1996 Declaration On Space Benefits on the Occasion of its Fifteenth Anniversary, 38 J. Space L 1, 9 (2012), citing a Working Paper submitted by Argentina, Brazil, Chile, Mexico, Nigeria, Pakistan, Philippines, Uruguay, and Venezuela, U.N. Doc A/AC.105/C.2/L.182 (Apr. 9, 1991).

53 *Id.* See also, M. Benko and K.-U. Schrogl, Space Benefits’ – Towards a Useful Framework for International Cooperation, 5 Space Pol’y 5, 6 (1995).

54 *Id.*, citing a Working Paper submitted by Germany and France, U.N. Doc A/AC.105/C.2/L.197 (Mar. 24, 1995).

55 Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries, UNGA Res. 51/122, of 13 December 1996; UN Doc. A/RES/51/122. (The Space Benefit Declaration).

56 See, e.g., Hobe, *supra* note 51, citing, M. Benko and K.-U. Schrogl, The 1996 UN-Declaration on “Space Benefits” Ending the North-South Debate on Space Cooperation, Proc. 39 Proc. Int’l Inst. Space L. 183.

57 One proposal involves the establishment of an international authority modeled on the 1994 Agreement of Part XI of the Law of the Sea Convention which established a market-friendly environment for developed States. See, Tronchetti, F., The Moon Agreement In The 21st Century: Addressing Its Potential Role In The Era Of

transfer of technology and welcomed a more market-centric approach to benefit sharing.⁵⁸

It turns out that there are many ways to share benefits of space exploration that do not involve monetary compensation. Developed nations have implemented this declaration by sharing directly or as by-products access to new developments such as weather monitoring, risk assessment, mitigation data and humanitarian aid for natural disasters; remote sensing data for precision agriculture, resource management and climate change; tele-medicine technology to provide medical access to remote areas; and basic space technology to build indigenous technological capacity in developing nations.⁵⁹ State action implementing the Space Benefits Declaration illustrates the many ways that states and their nongovernmental entities are creative in identifying ways of providing benefits to the international community while still controlling the monetary compensation derived from their space-based ventures. Going forward, it is expected that cooperation will be on an “equitable and mutually acceptable basis” and therefore that any interpretation of Article I mandating a literal, or financial, sharing of economic benefits is implausible.

Finally, the question of a moratorium on space mining must be addressed. There are some experts who believe the Moon Agreement places a moratorium on lunar resource utilization, at least as to those who are party to it, especially considering the language of Article 11.⁶⁰ However, the negotiating history of the treaty makes it clear that, at least by 1979, any original argument for a moratorium on resource mining had already been rejected and that rejection was accepted by its original proponents. Further, a joint proposal put forward in 1974, which would have permitted only “exploration for experimental purposes,” which was not accepted⁶¹ in response to the United States’ early, vigorous and uncontradicted opposition to any such moratorium.⁶²

Commercial Exploitation Of The Natural Resources of The Moon and Other Celestial Bodies, 36 J. Space L. 489, 521 (2010).

58 See, Jakhu, R., Hobe, S., Freeland, S., The Appropriateness of the Moon Agreement for Lunar Exploration and Use, 53 Proc. Int’l Inst. Space L. 562, 564 (2010).

59 Among many examples. See programs elaborated at United Nations Programme on Space Applications, <http://www.unoosa.org/oosa/en/sapidx.html>, and UN-SPIDER program, available at <http://www.unoosa.org/oosa/en/unspider/index.html>.

60 See, e.g., Von der Dunk, F., The Dark Side of the Moon-The Status of the Moon: Public Concepts, Private Enterprise, Proc. Fortieth Colloquium On L. Outer Space 119, 121 (1998).

61 See, Bin Cheng, *supra* note 23, at 20.

62 Hosenball testimony, *supra* note 49, at 84 and 86. See also, Bin Cheng, *supra* note 23, at 20 (“In the light of the controversial nature of the General Assembly resolution calling for a moratorium on the exploitation of the resources of the sea-bed and ocean floor, the twice repeated assertion of the United States delegates during the drafting of the treaty that there was no moratorium on exploitation – which assertion

To sum up, the arguments that the extraterrestrial removal of natural resources contradicts international law goes against the weight of current thinking. A majority of space law experts agree that once removed from their original location, lunar resources can become the property of whoever has extract them, even without first establishing a regime agreed by all States.

5. Moon Agreement as an Aid to Treaty Interpretation

5.1. Moon Agreement Is Important, if Not Binding

In the early 1960s, it was clear that both governmental and non-governmental entities would be allowed to engage in the exploration, use, and exploitation of the space environment and there was debate as to what entities should be allowed to exploit natural resources.⁶³ Proposals for a treaty intended to govern celestial bodies and their resources were proposed to UN Committee On the Peaceful Uses of Outer Space (UNCOPUOS) in the 1960s and taken up for consideration by the Legal Subcommittee of the COPUOS in earnest in 1972.⁶⁴ There followed nearly eight years of negotiation – led by the United States and the Soviet Union – which resulted in approval of all of its members in 1979⁶⁵ without a single dissent or objection from any state.⁶⁶ The agreement, sponsored by 38 delegations, was adopted by the U.N. Special Political Committee and by the General Assembly on December 5, 1979, in both cases by consensus.⁶⁷

This concise review of history is intended to point out that the Moon Agreement was no casual piece of legislation thrown together by a cadre of developing countries. It was planned – and led – by the same states that crafted the Outer Space Treaty and the other space law treaties, in the same era. It also establishes that the States comprising UNCOPUOS all agreed as of 1979 that the text of the Moon Agreement was, at the very least, consistent with the Outer Space Treaty.

The Outer Space Treaty and the Moon Agreement are documents written by the same author. The UNCOPUOS and its Legal Subcommittee initially set

not being contradicted – must be taken as expressive of the views of those who drafted the treaty”).

63 See, Christol, C., *The Modern International Law Of Outer Space* 249 (1982), citing Zhukov. G.P., *The Problem of Legal Status of Scientific Research Station on the Moon*, 10 *Proceedings* 61 (1968).

64 See, Bini, A., *The Moon Agreement: Its effectiveness in the 21st Century*, *ESPI Perspectives* No 14, at 1-2 (October 2008).

65 See, Christol, C.Q., *The Moon Treaty: Fact and Fiction*, April 2, 1980, available at <http://www.csmonitor.com/1980/0402/040234.html>; Jakhu, *et al.*, *supra* note 58, at 566.

66 34 U.N. GAOR, Supp. (No. 20) 10-12, Doc. A/34/20 (1979). See also, Hosenball Testimony, *supra* note 49, at 84.

67 UN General Assembly Resolution 34/68, December 5, 1979. See Griffin, N., *Americans And The Moon Treaty*, 46 *J. Air L. & Com.* 729, 734-35 (1981).

forth its grand vision in the Outer Space Treaty and produced in short order four follow-on documents that clarified its more general provisions. The Rescue Agreement clarified some of the broader pronouncements in Articles V and VIII, the Liability Convention provided more specificity on Article VII and the Registration Convention filled numerous voids in Articles V and VIII. Like its siblings, the Moon Agreement was also authored to explicate general principles of the Outer Space Treaty, in particular the Article I “freedom to explore and use outer space, including the Moon and other celestial bodies” and the nonappropriation principle in Article II.

The premise of the Moon Agreement is reflected in the last paragraph of its Preamble, which refers to the “need to define and develop the provisions of these international instruments [the foregoing space treaties] in relation to the Moon and other celestial bodies, having regard to further progress in the exploration and use of outer space.” In other words, one of the driving forces behind embarking on the Moon Agreement was to define and develop provisions in the Outer Space Treaty. Accordingly, the former does constitute an elaboration of the later insofar as it further delineates the fundamental rules in dealing with celestial bodies.⁶⁸ Thus, even though its provisions may not be binding on most spacefaring States, they are nevertheless important because they clarify the intentions of their shared authorship.

5.2. Interpretation of Article I OST

As far as international law is concerned, there are three basic approaches to treaty interpretation in the solution of ambiguous provisions. The first focuses on the actual text of the agreement to analyze its words; the second looks to the intention of the parties; and the third evaluates the text in light of the object and purpose of the treaty.⁶⁹ Articles 31 to 33 of the Vienna Convention comprise all three doctrines and reflect customary international law.⁷⁰

The rules of treaty interpretation, according to the Article 31(3) of the Vienna Convention on the Law of Treaties,⁷¹ require, *inter alia*, that one should consider the context together with:

- (a) Any subsequent agreement between the parties regarding the interpretation of the treaty or the application of its provisions;
- (b) Any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation;

68 See, Von der Dunk, *supra* note 23, at 254.

69 Shaw, M., *International Law* 932 (6th ed., 2008), citing Sinclair, *Vienna Convention*, at 114-15.

70 *Id.*, and cases cited in fn. 142 therein.

71 Article 31(3), *Vienna Convention on the Law of Treaties*, May 23 1969, 1155 U.N.T.S. 331, 8 I.L.M. 679, available at: <https://treaties.un.org/doc/publication/unts/volume%201155/volume-1155-i-18232-english.pdf>. See, Shaw, *supra* note 69, at 934.

- (c) Any relevant rules of international law applicable in the relations between the parties.

The Moon Agreement, a follow-on treaty from the Outer Space Treaty through which it derived its *raison d'être*, satisfies the requirement of agreement in Article 31(3)(a). It is subsequent state practice under Article 31(3)(b), so that its provisions and negotiating history are also relevant to interpret any vague and ambiguous provisions in the Outer Space Treaty.⁷² They were negotiated and agreed by consensus by the same UN committee and unanimously adopted by the General Assembly. Hence, the Moon Agreement expresses the agreement of the parties to the Outer Space Treaty and it is important notwithstanding its nonbinding status on spacefaring states.

The preamble of the Moon Agreement makes clear that at least part of its existence is owed to “the need to define and develop the provisions of these international instruments,” including the Outer Space Treaty, “having regard to further progress in the exploration and use of outer space.” It is fair to say that the ambiguities of the scope of “use” in Article I of the Outer Space Treaty provoked the need to negotiate an agreement more specifically defining the acceptable uses of the moon and other celestial bodies.

5.3. Moon Agreement Helps Establish Resource Exploitation Does Not Violate International Law

As an elaboration of basic principles established in the Outer Space Treaty, the Moon Agreement clarifies existing international space law many respects.⁷³ As for the intent to apply the prohibition of appropriation only to natural resources “in place”, to distinguish them from natural resources removed, the negotiation history establishes that no state objected to the understanding that the words used in Article 11(3) were intended to indicate that the prohibition against assertion of property rights would not apply to natural resources once reduced to possession through exploitation, whether by a state or a non-governmental enterprise.⁷⁴ There was no opposition in 1972, when this statement was first made, or throughout the ensuing negotiations leading up to the final day of negotiations on July 3, 1979, when consensus among every member state of COPUOS was reached on the text of the Moon Agreement.⁷⁵ The provisions of that treaty reflect the actual commitment of all States to be bound by them.⁷⁶

⁷² See, e.g., Hobe, *supra* note 51, at 209-210.

⁷³ Hosenball Testimony, *supra* note 49, at 84-85, identifying at least fourteen provisions that clarify the OST.

⁷⁴ Hosenball testimony, *supra* note 49, at 86.

⁷⁵ *Id.*

⁷⁶ See, e.g., Vladimír Kopal, *The Role of UN Declarations of Principles in the Progressive Development of Space Law*, 16 J. Space L. 5, 19 (1988) (“declarations adopted by the Legal Subcommittee could be regarded as expressions of “a legal

Thus, the Moon Agreement is a helpful document when it comes to bolstering legal support for the Space Resource Act, not because the United States or any other spacefaring nation is legally bound by it, but because it aids in clarifying just what the UNCOPUOS intended when it drafted (and we ratified) the Outer Space Treaty, which no one denies is authoritative. Because the same committee authored both treaties, there is no better extrinsic evidence of intent behind provisions in the first treaty than what was explicated in the latter. Thus, the negotiation of language in the Moon Agreement shows UNCOPUOS countries all agreed on at least a couple helpful facts:

- (1) The exploration and exploitation of natural resources on celestial bodies are among the legal uses that may be employed by states under Article I.
- (2) The removal of natural resources from a celestial body is not appropriation prohibited under Article II.

Interpreting the Outer Space Treaty in light of subsequent agreement in the Moon Agreement,⁷⁷ the fact that States designed a treaty to address the exploitation of natural resources in the first place shows that they presumed no prohibition was intended in the 1967 Outer Space Treaty.⁷⁸

The United States need not be concerned about distancing itself from the Moon Agreement.⁷⁹ Inexplicably, and despite all objective legislative history to the contrary, the Moon Agreement has been shunned for all the wrong reasons – a nonexistent moratorium on resource extraction, an agreement to agree on an international regime, an emasculated common heritage of mankind provision and an unfounded misapprehension of forced benefit sharing. But despite adamant refusal to be bound by its provisions, the United States and other space-faring nations owe a debt of gratitude to this treaty, in whose arguably flawed provisions shines the language that bestows legitimacy on the extraction of extraterrestrial natural resources as a legal use permitted by the Outer Space Treaty.

6. Back to National Legislation

Until very recently there has been no push to open up the frontiers of outer space to mining activity and, thus, no pressing need to follow up on the Moon Agreement or establish any legal foundation for it at all. Considering

conviction of all members of the world organization, or an overwhelming majority thereof, concerning their particular subject matter.”)

⁷⁷ Hobe, *supra* note 51, at 209.

⁷⁸ Hobe, *supra* note 51, at 210.

⁷⁹ From the moment the Agreement was open for signature to the current era, rational explanations have fallen on deaf ears. See, Finch, Jr., E.R., 1979 U.N. Moon Treaty Encourages Lunar Mining and Space Development, 22 Proc. Int'l Inst. Space L. 123 (1980) and Hosenball Testimony, *supra* note 49. See also, Jakhu, *et al.*, *supra* note 58, at 564-66 (2010).

the absence of a cause, the political will has been too weak to resurrect a charge on a formidable opposition that once leveraged mistrust of the advancing “New International Economic Order” in order to associate the Moon Agreement with an implicit aura of wealth redistribution.⁸⁰ But times have changed and benefit sharing has turned out not to be the political bogeyman it was made out to be.

In 1979, the Moon Agreement may have been seen as a solution looking for a problem but that, too, has changed. There is now an interest in establishing a commercial industry for space resources. Asteroid mining companies, like Planetary Resources, headed by a former flight director for NASA’s Mars Rover missions and funded by several multi-billionaires,⁸¹ and Deep Space Industries, headed by mining industry experts and a partnership with Luxembourg,⁸² as well as lunar mining companies like Moon Express, a privately funded commercial space company,⁸³ and Shackleton Energy Company, headed by Bill Stone, a world class caver and explorer,⁸⁴ and many others have been actively engaged in establishing a market for extraterrestrial space resources.

The Space Resources Act attempts to address a legal problem that has come of age. That legislation seeks to fill the void in international law by establishing that – subject to license requirements and compliance with international law, a United States citizen may possess, own, transport, use, and sell as his/her/its property any asteroid resource or space resource obtained.

Obviously, the Space Resources Act is by definition applicable only within the jurisdiction of the United States.⁸⁵ It simply codifies the rights of U.S. citizens to explore, extract and own resources extraterrestrial resources. This is by no means an aggressive stretch, even in international circles. In 2009, the board of directors of the International Institute of Space Law (IISL)

80 The NIEO was a program initiated by a large number of developing countries to change the existing rules of the global economy. See, “Declaration on the Establishment of a New International Economic Order, United Nations General Assembly Resolution 3201 (S-VI), A/RES/S-6/3201 (May 1, 1974). See, Report prepared by Congressional Research Service at the request of Committee on Commerce, Science and Transportation at 466 (The Arguments in Opposition” to the Moon Agreement) (October 9, 1980), http://njlaw.rutgers.edu/collections/gdoc/hearings/8/80602580d/80602580d_1.pdf. See also, Gangale, *supra* note 3, at 67-68.

81 Information on Planetary Resources can be found at <http://www.planetaryresources.com/#home-intro>.

82 Information on Deep Space Industries can be found at <http://deepspaceindustries.com>.

83 Information on Moon Express can be found at <http://www.moonexpress.com>.

84 Information on Shackleton Energy Company can be found at <http://www.shackletonenergy.com>.

85 See, Section 403, *supra* note 7.

published a consensus opinion that the Outer Space Treaty does not outlaw the use of space resources, even if international law does not (yet) include detailed provisions to regulate that industry.⁸⁶ In the absence of any hope for a consensus agreement on a legal regime for the exploitation of resources at any time soon, the United States opted to exercise its right (and obligation) under Article VI to legislate rules for its own domestic regulation the activity and in the process, provide some measure of certainty for potential investors in the industry. It establishes a foundation to elaborate more and better detailed provisions as technology progresses and the international legal community begins in earnest to come to some agreement on rules that all can accept.

7. Conclusion

International consensus on an approach to exploitation of extraterrestrial resources is simply not realistic today. Under no scenario will a company be permitted to own exclusive title to extraterrestrial territory. But resources are not territory and they may be exploited. States may encourage the commercial development of technology and processes by building into the licensing laws and regulations protections and freedoms that comply with international law. The Space Resources Act provides a starting point from which the U.S. can gain international support as its domestic space resource law framework matures. The private companies in the US and other areas of the world should be encouraged and supported by the domestic and international space laws that draw strength from the Outer Space Treaty provisions that celebrate the right of all countries of the world to enjoy and use outer space peacefully.

⁸⁶ See, IISL Statement, *supra* note 11.

