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**ONE SMALL STEP: THE IMPACT OF THE U.S.
COMMERCIAL SPACE LAUNCH COMPETITIVENESS
ACT OF 2015 ON THE EXPLOITATION OF RESOURCES
IN OUTER SPACE**

P.J. Blount* & Christian J. Robison*

The United States Congress recently passed the U.S. Commercial Space Launch Competitiveness Act (“CSLCA”). Title IV of the Act ultimately recognized commercial property rights in resources extracted from extraterrestrial bodies. Consequently, the passage of such legislation has once again brought property rights in outer space to the forefront of legal discussion. Although some have said that the CSLCA directly conflicts with Article II of the Outer Space Treaty, the CSLCA should be seen as a valid interpretation of Article II given the numerous ambiguities inherent in the article itself. More importantly, the CSLCA acts as an incremental mechanism in the formation of international space law that, in turn, should eventually allow States to come to innovative and cooperative solutions to preserve the Article II regime amidst future commercial efforts in outer space.

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INTRODUCTION

In the fall of 2015, the United States Congress passed the U.S. Commercial Space Launch Competitiveness Act (“CSLCA”).¹ Title IV of the Act, Space Resource Exploration and Utilization, ultimately recognized commercial property rights in resources extracted from celestial bodies.² The CSLCA was met with exuberance by the commercial space sector, but many scholars declared that the legislation was a violation of international space law. For example, one commentator equated the law to a “land

¹ U.S. Commercial Space Launch Competitiveness Act, H.R. 2262, 114th Cong. (2015).

² ‘Celestial bodies’ is a term used in international space law. For instance, it is found in the third UN General Assembly that addresses outer space activities, which states “[o]uter space and celestial bodies are free for exploration and use by all states.” G.A. Res. 1721 (XVI), International Co-operation in the Peaceful Uses of Outer Space (Dec. 20, 1961). The term is never defined in the treaty regime, and it is generally understood to encompass all naturally occurring bodies in the void of space other than Earth, including the Moon. See, for instance, the formulation in the Moon Agreement, which states “provisions of this agreement relating to the Moon shall also apply to the other celestial bodies within the solar system, other than the Earth” Agreement Governing the Activities of States on the Moon and Other Celestial Bodies art. I, Dec. 5, 1979, 1363 U.N.T.S. 3 [hereinafter Moon Agreement].

grab” and suggested that the bill’s authors “should read the space treaties.”³ Similarly, others felt that it “represent[ed] a full-frontal attack on settled principles of space law,”⁴ or that the law violated the Outer Space Treaty regime altogether.⁵ The narrative in such backlash conceptualizes international space law, specifically Article II of the Outer Space Treaty, as set with static content.⁶

Critics of the CSLCA may forget that the Outer Space Treaty was written in contemplation of innovation. The drafters were writing law for technology that was uncertain in its development, yet an immediate threat to international peace and security. As a result, they drafted broadly defined principles to preserve space for peaceful uses, but left States a wide latitude of negotiation as to the specific content of those principles. This was done so that the law could adapt as the technology emerged. Thus, innovation can be said to be a specific value that is embedded in international space law. Indeed, the Outer Space Treaty itself is an example of legal innovation.

It is in this context that this article casts its opinion on the passage of the US Commercial Space Launch Competitiveness Act and its title on Space Resource Exploration and Utilization. This article argues that the new law constitutes State interpretation of Article II of the Outer Space Treaty and that it is a critical piece to the puzzle in determining the meaning of the content of Article II.

³ See Trevor Batch, *Obama’s New Push to Mine Outer Space Could Spark a Disaster, Miami Professor Warns*, MIAMI NEW TIMES, (Dec. 10, 2015), <http://www.miaminewtimes.com/news/obamas-new-push-to-mine-outer-space-could-spark-a-disaster-miami-professor-warns-8105384> (quoting Dr. Sylvia Ospina).

⁴ See, e.g., Gbenga Oduntan, *Who Owns Space? U.S. Asteroid-Mining Act is Dangerous and Potentially Illegal*, THE CONVERSATION, (Nov. 25, 2015), <https://theconversation.com/who-owns-space-us-asteroid-mining-act-is-dangerous-and-potentially-illegal-51073>.

⁵ *U.S. Space-Mining Law Seen Leading to Possible Treaty Violations*, CBC NEWS (Nov. 26, 2015), <http://www.cbc.ca/news/technology/space-mining-us-treaty-1.3339104> (citing Ram Jakhu).

⁶ Tanja Masson-Zwaan & Bob Richards, *International Perspectives on Space Resource Rights*, SPACE NEWS (Dec. 8, 2015), <http://spacenews.com/op-ed-international-perspectives-on-space-resource-rights/> (“[T]hese opinions are largely independent ones and not supported by international consensus.”).

Therefore, Part I of this article discusses the ambiguities inherent in Article II and reflects upon how these ambiguities leave the content of Article II open for negotiation. Part II provides a brief overview of Title IV of the CSLCA and provides a surface-level analysis as to how such legislation complies with certain provisions of the Outer Space Treaty. Part III argues that domestic legislation can be important in determining the content of international law. This part also includes an analysis of Title IV of the CSLCA in this context. The final section of this Article concludes by reflecting on the possible impact that CSLCA may have on the content of international space law.

I. AMBIGUOUS ARTICLE II

Article II of the Outer Space Treaty is fraught with ambiguity. It not only fails “to anticipate all the realities of our current world,”⁷ but also seems to purposely use language that allows for multiple conflicting interpretations that are not always reconcilable. Even when confronted with a “plain language”⁸ reading using the purpose and scope of the treaty, Article II still defies a universally accepted definition. This is in large part due to the Cold War atmosphere that pervaded negotiations of the Outer Space Treaty.⁹ As a result, Article II is drafted in such a way that allows it to bend to political ideology. On the one hand, Article II can be read in conjunction with Article I to support a socialist reading that reflects communitarian exploitation of space for the “benefit and in the interests of all countries.”¹⁰ On the other hand, Article II can be read from a liberal viewpoint that frees space from State sovereignty, but contemplates the development of

⁷ *Id.*

⁸ Vienna Convention on the Law of Treaties art. 31, May 23, 1969, 1155 U.N.T.S. 331.

⁹ See Joanne Irene Gabrynowicz, *Space Law: Its Cold War Origins and Challenges in the Era of Globalization*, 37 SUFFOLK U. L. REV. 1041, 1046 (2004).

¹⁰ 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, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

commercial activities as a “use of space.”¹¹ A better reading of Article II is likely neither socialist nor liberal. Instead, it should be read as anti-imperial or anti-colonial, which represents a common ground between Soviet communism and liberalism in the American tradition. Article II is carefully worded to exclude imperial logics from extending into space, while avoiding ideological differences. This section elaborates upon three specific ambiguities: the concept of “use and occupation,” the issue of private actors, and the issue of resource extraction as a type of appropriation.¹² The first two of these issues are dealt with briefly, and the final one receives an in depth analysis as it cuts to the core of the non-appropriation principle of the Outer Space Treaty regime.

A. Use and Occupation

Article II of the Outer Space Treaty states, “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.”¹³ It is clear that Article II, in conjunction with Article I,¹⁴ establishes a regime of *res communis* in outer space.¹⁵ In short, the Treaty regime allows for the free use and exploration of outer space and prohibits any claims of sovereignty as mechanism for establishing the first right. Specifically, Article II implements a ban on appropriating space through use or occupation.¹⁶ This language was chosen to differentiate outer space from terrestrial territories that can be subject to claims of national appropriation. In fact, use and occupation are not necessarily unlawful as a result of Article II.

¹¹ *Id.* art. II.

¹² *See id.*

¹³ *See id.* art. II.

¹⁴ *Id.* art. I (“Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies.”).

¹⁵ *See* ANTHONY AUST, HANDBOOK OF INTERNATIONAL LAW 40 (2d ed. 2010); *see also* MALCOLM N. SHAW, INTERNATIONAL LAW 382 (4th ed. 1997).

¹⁶ Outer Space Treaty, *supra* note 10, art. I-II.

Article I endorses States' explicit rights to the "exploration and use" of outer space.¹⁷ Similarly, Article XII grants rights of reciprocal access to "stations, installations, equipment, and space vehicles on the Moon and other celestial bodies," meaning that the drafters contemplated the possibility of occupation in terms of inhabitation.¹⁸ Since the Outer Space Treaty acknowledges the possibility of use and occupation by States, Article II's prohibition is a very specific one—it is a prohibition on sovereign appropriation that historically resulted from such use and occupation.¹⁹

This bifurcation of legal occupation from sovereignty is consistent with the post-colonial values that inform our understanding of Article II. The exclusion of sovereignty decreased incentives for States to engage in a tension heavy extraterritorial land grab, yet left the door open for innovation through a cooperative structure. The nature of this cooperative structure, elaborated upon in Article IX,²⁰ is admittedly vague, but it is only meant to be a framework in which to structure the negotiations over new technologies. The ambiguity caused by the potential for long term presence on a celestial body is resolved by requiring the legal structure governing that presence to flow from a claim of jurisdiction distinct from territorial sovereignty. This is why Articles VI²¹ and VIII²² provide for, and require, other

¹⁷ Outer Space Treaty, *supra* note 10, art. I.

¹⁸ Outer Space Treaty, *supra* note 10, art. XII.

¹⁹ FRANCIS LYALL & PAUL B. LARSEN, *SPACE LAW: A TREATISE* 60-61 (Ashgate Publishing, Ltd. 2013) (noting it is the "intention to act as sovereign in relation to the occupied location," and not the occupation itself).

²⁰ Outer Space Treaty, *supra* note 10, art. IX ("States Parties to the Treaty shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space, including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty.").

²¹ *Id.* art. VI ("States Parties to the Treaty shall bear international responsibility for national activities in outer space . . .").

²² *Id.* art. VIII ("A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object . . .").

methods to extend State jurisdiction to fit commercial enterprises within the cooperative structure.

B. Private Actors

The second ambiguity caused by Article II is its application to private actors. This was the central claim in *Nemitz v. United States*.²³ Nemitz, a United States citizen, asserted ownership of an asteroid and attempted to collect rent from NASA for space occupied on the asteroid by one of its spacecraft.²⁴ In his claim, Nemitz asserted that the Outer Space Treaty is a treaty among States and thus did not apply to him as an individual.²⁵ While *Nemitz* is an absurd case, it does raise a valid question of how Article II creates obligations for individuals. In other words, how can individuals be precluded from territorial appropriation?

Scholars have been divided on the matter.²⁶ Those who assert that the Treaty applies to private actors counter arguments such as Nemitz's by pointing to the "any other means" language included in Article II.²⁷ An extreme construction of this argument claims that a State grant of property rights to private actors is functionally an act of territorial appropriation, characterizing private property rights as appropriation "by any other means."²⁸

Neither of these extremes fully captures the entire scope of the ambiguity. These two extremes treat Article II as a binary that is either on or off. The true ambiguity within Article II is not whether

²³ *Nemitz v. United States*, No. CV-N030599-HDM (RAM), 2004 WL 3167042 at *1 (D. Nev. Apr. 26, 2004) *aff'd sub nom.* *Nemitz v. N.A.S.A.*, 126 F. App'x 343 (9th Cir. 2005).

²⁴ *Id.*

²⁵ See Robert Kelly, *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, 300-01 (2004).

²⁶ See, e.g., W.N. White Jr., *Interpreting Article II of the Outer Space Treaty*, 46th Colloquium on the Law of Outer Space 175 (2003); Stephen Gorove, *Interpreting Article II of the Outer Space Treaty*, 11th Colloquium on the Law of Outer Space 40 (1968) (acknowledging that Article II of the Treaty does not expressly prevent private appropriation of outer space).

²⁷ See Carl O. Christol, *Article 2 of the 1967 Principles Treaty Revisited in OUTER SPACE: PROBLEMS OF LAW AND POLICY* 78, 78-82 (1997).

²⁸ See LYALL & LARSEN, *supra* note 19, at 184-85.

it applies to private actors, but what limitations it places on the State's ability to enable these private actors. Article II is extended to private actors through Article VI, which imputes upon States "international responsibility" for their non-governmental actors.²⁹ The effect of this clause is not to pass an international obligation to the individual that would result in an international crime. Instead, it makes the acts of non-governmental actors attributable to the State as contemplated in Article 11 of the Articles on State Responsibility for Internationally Wrongful Acts.³⁰ This means that a State is obligated to maintain control over all commercial actors, but it must extend rights and obligations to them within a narrow jurisdictional framework constructed by Article II, Article VI, and Article VIII of the Outer Space Treaty.³¹

This does not preclude commercial activity, but it creates an interesting problem *vis a vis* property rights. Private interests are protected by States through a system of property rights including real, chattel, and intellectual property.³² Real property is directly connected to territorial sovereignty as well as the protection of private and commercial rights. This is why some argue that the

²⁹ Outer Space Treaty, *supra* note 10, art. VI; *see also* International Institute of Space Law, *Statement by the Board of Directors of the International Institute of Space Law (IISL) On Claims to Property Rights Regarding The Moon and Other Celestial Bodies*, http://www.iislweb.org/docs/IISL_Outter_Space_Treaty_Statement.pdf ("[A]ccording to international law, and pursuant to Article VI, the activities of non-governmental entities (private parties) are national activities. The prohibition of national appropriation by Article II thus includes appropriation by non-governmental entities (i.e. private entities whether individuals or corporations) since that would be a national activity [Therefore], [a]ccording to international law, States party to a treaty are under a duty to implement the terms of that treaty within their national legal systems.").

³⁰ Responsibility of States for Internationally Wrongful Acts art. 11, G.A. Res. 56/83, U.N. Doc. A/RES/56/83 (Jan. 28, 2002) ("Conduct which is not attributable to a State under the preceding articles shall nevertheless be considered an act of that State under international law if and to the extent that the State acknowledges and adopts the conduct in question as its own.").

³¹ *See supra* notes 10, 21-22 and accompanying text.

³² *See* JOHN A. MCKINSEY & DEBRA D. BURKE, *CARPER'S UNDERSTANDING THE LAW* 424 (7th ed. 2015).

“use” of outer space should be limited both spatially and temporally.³³

Article II then runs a gauntlet by allowing States to permit commercial activity, a liberal value, but tying it closely to the persona of the State, a socialist value. As a result, commercial activities are limited by a State’s ability to authorize activities that would result in a “national appropriation.”³⁴ Therefore, the real ambiguity is the scope of activities that a State can control without appropriating space or celestial bodies.

C. The Exploitation of Natural Resources

These first two ambiguities lead to the third ambiguity, which is the central question raised by Title IV of the CSLCA—whether the principles of *res communis* prohibit the exploitation of removable resources in outer space. The connection between appropriation and resource extraction is a critical point of contestation in the literature on Article II, although Article II “does not prohibit the extraction and appropriation of natural resources.”³⁵ Despite the lack of a textual, affirmative prohibition, Article II does place some limitations on States *vis a vis* their ability to extract resources as Article II may “constitut[e] an absolute legal barrier in the realization of every kind of space activity.”³⁶ This paper argues that this is the result of a post-colonial construction that sought to prevent the spatial expansion of geopolitics. Consequently, there is an undefined gap between the act of “appropriating” and the act of “using” space resources.

³³ See, e.g., Brendan Cohen, *Use Versus Appropriation of Outer Space: The Case for Long-Term Occupancy Rights*, 2014 INT’L INST. SPACE LAW PROC. 35, 35-52.

³⁴ See Center For Research of Air and Space Law, *International and Interdisciplinary Workshop on Policy and Law Relating to Outer Space Resources: Examples of the Moon, Mars and Other Celestial Bodies*, 16 (2006) (“This prohibition of appropriation by states extends through Art. IV of the Outer Space Treaty also to privacy nationals.”).

³⁵ *Id.*

³⁶ I.H.PH. DIEDERIKS-VERSCHOOR, AN INTRODUCTION TO SPACE LAW 28 (2d rev. ed., 1999).

Writing in the period between the end of the Second World War and the dawn of the Space Age, legal theorist Carl Schmitt argued that the history of international law could be traced through “land appropriation,” which is the “primeval act in founding law.”³⁷ Schmitt’s analysis is meant to illustrate that post-1945 international law was meant to construct a new spatial order to govern the entirety of the globe. This order entrenched borders by linking sovereignty to territory.³⁸ The entrenchment of territorial borders was a mechanism through which the great powers sought to contain the imperial impulses that had repeatedly led to war. The emergence of space technology presented a fundamental challenge to the spatial order of international law by opening up the possibility of the spatial expansion of the State. The Outer Space Treaty brings space technology into international law, and Article II is an attempt to maintain the spatial order constructed by the United Nations Charter.

Therefore, complications result when Article II is read to implicate property rights directly, since “appropriation” is primarily concerned with the expansion of State *territory*, not *property*. It is the indirect connection between the spatial concepts of territory and property that creates an unresolved ambiguity. Some scholars would assert that general prohibition against claims of sovereignty in outer space extend to the exploitation of natural resources.³⁹ For instance, noted scholar Stephen Gorove asserts that “because the Outer Space Treaty never makes a distinction between outer space and its natural resources . . . the term outer space must be understood as resources. Moreover, the appropriation of natural resources for the exclusive benefit of the user appears to be in contrast with [Article I].”⁴⁰ Such

³⁷ CARL SCHMITT, *THE NOMOS OF THE EARTH IN THE INTERNATIONAL LAW OF THE JUS PUBLICUM EUROPAEUM* 45 (G.L. Ulmen trans, Telos Press ed., 2003).

³⁸ See U.N. Charter art. 2(4).

³⁹ See, e.g., STEPHEN GROVE, *STUDIES IN SPACE LAW: ITS CHALLENGES AND PROSPECTS* 82 (Sijthoff A. Leiden ed., 1977) (“[A]ny use involving consumption or taking [of natural resources] with intention of keeping for one’s own exclusive use would amount to appropriation.”).

⁴⁰ FABIO TRONCHETTI, *THE EXPLOITATION OF NATURAL RESOURCES OF THE MOON AND OTHER CELESTIAL BODIES – A PROPOSAL FOR A LEGAL REGIME* 32 (2009) (citing Stephen Gorove, *Limitations on the Principles of Freedom of*

interpretations compress territory, real property, and chattel property in such a way that resource extraction is a functional equivalent to appropriation. In contrast, other commentators have argued that the right to freely explore and use outer space is analogous with the rules underlying other *res communis* regimes such as the high seas.⁴¹ In sum, these authors argue that “States [and private actors] are entitled to appropriate outer space natural resources so long as their activities do not involve *any permanent appropriation* of . . . the areas in which resources are appropriated and until such activities do not prevent other[s] . . . from doing the same.”⁴²

Again, while both of these groups make compelling arguments, it is important to remember that Article II applies to the concept of *territory* and not to *property*. Article II functions to exclude outer space from the territory of States, thus appropriation only occurs when property rights flow from territorial claims.⁴³ Therefore, we must inquire about the legal condition of property in spatial areas designated outside the borders of any State. In international law, such areas are known *res communis* and are held as a global

Exploration and Use in Outer Space, 13th Colloquium on the Law of Outer Space 40 (1970)).

⁴¹ See BIN CHENG, *STUDIES IN INTERNATIONAL SPACE LAW* 230 (1997); CARL Q. CHRISTOL, *THE MODERN INTERNATIONAL LAW OF OUTER SPACE* 41 (1982) (referencing the Outer Space Treaty’s corresponding *travaux préparatoires*).

⁴² TRONCHETTI, *supra* note 40, at 221 (emphasis added) (citing Outer Space Treaty, art. IX.).

⁴³ Although Article I does require that use and exploration be done for the benefit and interests of all States, this obligation is a soft one. This is different from the “common heritage of mankind” principle as applied to the deep sea bed, which places an obligation on states to share the resources that they gain from the deep sea bed. There is no firm obligation on how to share these benefits, and as such, sharing has occurred on an ad hoc basis, such as the sharing of satellite remote sensing data. See generally, G.A. Res. 51/122, Annex ¶ 2, 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 (Dec. 13, 1996) (“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.”).

commons by the international system.⁴⁴ Global commons is a legal typology; it is a term used to denote an area that is outside of the sovereign control of a nation-state and not subject to claims of territorial sovereignty. Two aspects of this delineation should be made clear.

First, the term global commons is a typology of legal space in international law. This is important because the term “commons” finds its roots in Roman law as well as English common law, but has traditionally been used to address economic or property interests. This has caused confusion because commons in international law, at its core, is a settlement of territory and not property.⁴⁵ While economic and property interests are implicated in spatial settlements, international law is structured through the allocation territory among sovereigns to avert international conflict.⁴⁶ Global commons, as part of this spatial matrix, is primarily about rights of exclusion maintained by States.

Second, as a legal typology, the global commons is a term that only has general legal content. It can only describe the legal state of a global commons in the least restrictive sense. It follows that each commons has its own internal *lex specialis* that applies within the framework of international law. Thus, the high seas,⁴⁷ the deep seabed,⁴⁸ Antarctica,⁴⁹ and outer space all have distinct legal regimes that create unique rights and obligations for States. This

⁴⁴ See *supra* notes 15-17 and accompanying text.

⁴⁵ Some argue that outer space is not a “global commons.” Such analysis mistakenly treats Article II as primarily concerned with property and engages in a historical analysis of “commons.” This mistake is further complicated by the assertion that because the word “commons” does not appear in the Outer Space Treaty, which ignores “global commons” as a legal typology in international law. See, e.g., HENRY HERTZFELD, BRIAN WEEDEN & CHRISTOPHER D. JOHNSON, HOW SIMPLE TERMS MISLEAD US: THE PITFALLS OF THINKING ABOUT OUTER SPACE AS A COMMONS, 2015 INT’L ASTRONAUTICAL CONGRESS PROCEEDINGS, <http://swfound.org/media/205285/how-simple-terms-mislead-us-hertzfeld-johnson-weeden-iac-2015.pdf>.

⁴⁶ Such a concept has been described as the “bracketing of war.” SCHMITT, *supra* note 37, at 55.

⁴⁷ U.N. Convention on the Law of the Sea arts. 86-120, Nov. 16, 1994, 1833 U.N.T.S. 3. [hereinafter UNCLOS].

⁴⁸ See *id.* at arts. 122-23 (defining enclosed or semi-enclosed seas).

⁴⁹ The Antarctic Treaty, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 71.

means that for each global commons, States are free to adopt a *lex specialis* that they perceive as the proper balance between international peace and security and their own self-interests. Each commons results from a settlement that reflects the physical characteristics of the area, current technology, historical perspectives, and specific geopolitics at the time of negotiation. With such consideration, States can allow for the presence of national jurisdictions within these spaces.

The crux of the question is whether an appropriation of territorial sovereignty occurs “by any other means” through the extraction of outer space resources.⁵⁰ In the face of this interpretive ambiguity, many have turned to the analogy of the law of the sea and the extraction of fish on the high seas.⁵¹ While the analogy is limited in its ability to elucidate specific legal principles, it does confirm the existence of legal extraction of resources in a global commons. In both the law of the sea and the law of Antarctica, resource extraction is addressed in specific clauses that make clear the extent to which commercial extraction can occur.⁵² Resource extraction for commercial purposes therefore can be interpreted as a valid “use” under general international law governing global commons, and the lack of a specific clause prohibiting such extraction within the body of space law is indicative of it being a valid use within the *lex specialis* of outer space. To that end, Article II leaves significant gaps that cannot be filled by comparison to other global commons which specify the extent to

⁵⁰ Outer Space Treaty, *supra* note 10, art. II.

⁵¹ See *supra* note 41 and accompanying text.

⁵² The “high seas” is designated as an area of broad liberal usage. See UNCLOS, *supra* note 47, art. 87. The extraction of resources from the deep seabed is governed by an international authority. See *id.* art. 136-37, 156. Any commercial exploitation of mineral resources in Antarctica is prohibited. Protocol on Environmental Protection to the Antarctic Treaty art. 7, Jan. 14, 1998. Resource extraction was one of the issues that the Moon Agreement was supposed to resolve through adoption of a system similar to the deep sea bed. See Moon Agreement, *supra* note 2, art. XI; see also Fabio Tronchetti, *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 (2010).

which States can exploit resources. In sum, failed agreements⁵³ to cure this error signifies that the specific prohibitions regarding extraterrestrial resource extraction and exploitation contained Article II are unsettled.

II. THE CSCLA

As noted, the Title IV of the CSLCA is the most recent, and most profound, American interpretation of the Article II regime. This particular piece of domestic legislation has developed over the course of several years to finally reveal the United States' position on the exploitation of natural resources by private commercial actors in relation to its Outer Space Treaty obligations. This section first provides a brief overview of the development of the text of Title IV. The next section then provides a surface-level analysis regarding Title IV's compatibility with the provisions of the Outer Space Treaty.

A. Development of CSCLA Title IV

In 2014, the House Committee on Science, Space, and Technology received the newly introduced "American Space Technology for Exploring Resource Opportunities In Deep Space Act," or the "ASTEROIDS Act."⁵⁴ Although this bill may not have been introduced as one that could become actual legislation, the proposed legislation did lead to discussion of private property rights in outer space that ultimately led to the inclusion of Title IV in the CSLCA.

The ASTEROIDS Act explicitly provided property rights over outer space resources to private commercial entities.⁵⁵ That is, the legislation stated that, "[a]ny resources obtained in outer space from an asteroid are the property of the entity that obtained such resources, which shall be entitled to all property rights thereto, consistent with applicable provisions of Federal law."⁵⁶ Although

⁵³ See, e.g., Moon Agreement, *supra* note 2.

⁵⁴ American Space Technology for Exploring Resource Opportunities In Deep Space Act, H.R. 5063, 113th Cong. (2014) [hereinafter ASTEROIDS Act].

⁵⁵ See *id.*

⁵⁶ *Id.*

this phrase in itself does not necessarily abrogate “existing international obligations of the United States”⁵⁷ by explicitly asserting claims of sovereignty over said resources, a literal reading of this text, absent a definition⁵⁸ of outer space resources, does in fact allow one to conclude that American legislators may have incidentally undermined the core principles of Article II by providing property rights that may conflict with the obligation to not appropriate space by means of use or occupation.⁵⁹

This particular concern remained as the initial ASTEROIDS Act proceeded to be amended. In regards to House Bill 1508 (“H.R. 1508”) or the “Space Resources Exploration and Utilization Act of 2015,”⁶⁰ a group of commentators believed that “the bill [as drafted] could be read to allow for expansive territorial claims over both asteroids and planetary surfaces well beyond what can be justified on the basis of Article IX’s non-interference principle”⁶¹ Such a matter was only complicated by a seemingly broad, yet narrow, definition of outer spaces resources and a subsequent provision that assigned private property rights only to resources extracted from an asteroid.⁶² Ultimately, the initial drafts of the ASTEROIDS Act and H.R. 1508 were amended to become Title IV of CSLCA and signed into law by President Barack Obama on November 25, 2015.⁶³ It should be noted that

⁵⁷ *Id.*

⁵⁸ The initial ASTEROIDS Act did not define outer space resources. *See* ASTEROIDS Act *supra* note 54.

⁵⁹ *See supra* notes 10, 11, and accompanying text.

⁶⁰ Space Resources Exploration and Utilization Act of 2015, H.R. 1508, 114th Cong. (2015).

⁶¹ Berin Szoka & James Dunstan, Letter to Bill Posey & Derek Kilmer, Members of Congress (May 19, 2015), http://docs.techfreedom.org/TF_Letter_Re_Amendments_to_HR_1508.pdf [hereinafter TechFreedom Letter].

⁶² H.R. 1508, *supra* note 60, defined a “space resource” as “a natural resource of any kind found in situ in outer space,” and an “asteroid resource as “a space resource found on or within a single asteroid.” H.R. 1508, *supra* note 60. Consequently, the same commentators as noted above believed that “the bill [was] also too narrow, in conferring property rights only over resources extracted from asteroids, rather than all space resources.” TechFreedom Letter, *supra* note 61.

⁶³ *See* ASTEROIDS Act, *supra* note 54, at Title IV.

Title IV was tacked onto a larger bill that contained a number of critical updates to United States space law.⁶⁴ These changes had little to nothing to do with extraterrestrial resources and were primarily concerned with improving government administration of the increasing commercialization of space. Incorporating Title IV into this larger bill likely made the controversial legislation easier to pass.

B. Initial Impressions of CSCLA Title IV

On its face, the CSLCA's provision regarding private property rights in outer space seems to be only a more specific description of the rights proposed by the initial ASTEROIDS Act. The Act's provision regarding private ownership of resources in outer space states:

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.⁶⁵

This change in language is quite important. Instead of granting the ambiguous "property rights," Title IV enumerates certain rights from the traditional bundle of rights that a commercial entity might have over chattel property.⁶⁶ Therefore, the rights granted by Title IV are narrower than the rights granted in the ASTEROIDS Act, making them less likely to run afoul of the prohibitions found in Article II.

Simply put, this particular language does a better job in ensuring that private entities only have property rights to resources extracted from asteroids or other celestial bodies. Moreover, the

⁶⁴ *See id.*

⁶⁵ U.S. Commercial Space Launch Competitiveness Act, H.R. 2262, 114th Cong. § 402 (2015).

⁶⁶ *See* ASTEROIDS Act, *supra* note 54, at Title IV.

more specific definition of outer space resources as contained in the Act further insinuates that private entities only have rights to resources and not to the body from which they were extracted. In that respect, the Act specifically defines two categories of resources: asteroid resources⁶⁷ and space resources.⁶⁸ It further elaborates the definition of space resources to include “water and minerals.”⁶⁹ By narrowly defining the rights that entities have to such resources, American legislators have arguably avoided showing an intent to allow private entities to have exclusive control over a celestial body or a portion of a celestial body from which resources could be extracted. In fact, the concluding language of the Act, language that was absent in both the ASTEROIDS Act and H.R. 1508, explicitly reaffirms the United States’ intent to comply with Article II by stating, “this Act . . . does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body.”⁷⁰

Despite the United States’ attempt to demonstrate that it does not condone violations of Article II, Title IV does not contain many explicit provisions that would necessarily prevent private entities from compromising other important Treaty provisions, specifically Article IX’s prohibition against “harmful interference.”⁷¹ For example, a private entity could rightfully lay claim to resources from an asteroid or other celestial body, but could *wrongfully* make a claim of “harmful interference” against another party who may attempt to extract resources from the same body that is not subject to the jurisdiction of any one State or private actor. This in effect would violate the principle of Article II by indirectly laying exclusive claims to a particular body in outer space. In this context though, it must be noted that a reporting requirement was included requiring the President to prepare a report on “the authorities necessary to meet the international obligations of the United States, including authorization and

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ Outer Space Treaty, *supra* note 10, art. IX; TechFreedom letter, *supra* note 61.

continuing supervision by the Federal Government.”⁷² Ultimately, while hypothetical violations can be posited, it seems as though the United States intends to promulgate regulations that fulfill its obligations under Article II as well as Article VI and Article IX of the Outer Space Treaty.

III. THE CSLCA AND INTERNATIONAL LAW

As noted above, one of the primary criticisms of Title IV of the CSLCA is that it violates Article II of the Outer Space Treaty.⁷³ In light of the ambiguities laid out in the initial sections of this article, this position seems fraught with problems. If, as this Article argues, the content of Article II is yet to be determined, then a more balanced approach is to read Title IV as a state interpretation of the content of Article II. To that end, this section proceeds in two parts. The first part discusses how domestic legislation can help build the meaning of international law. Consequently, the second part analyzes Title IV in this schema of international law.

A. *Filling the Gaps in International Law*

The ambiguities of Article II cannot be sufficiently resolved by applying a few general sources of international law. In fact, the interpretation and application of international obligations are ultimately dependent upon the actions of various States as they engage in the process of fulfilling their treaty obligations. This means that international law grows incrementally as States act and react within legal lacunae. Analysis of the incremental growth of law can assist in deciphering how Article II has developed beyond its text in regards to resource extraction.

Noted scholar Michael Reisman argued that “international incidents” form the “epistemic units” on which international law is built.⁷⁴ Under Reisman’s international incident model, international law is formed at decision points in which practitioners, such as

⁷² U.S. Commercial Space Launch Competitiveness Act, H.R. 2262, 114th Cong. § 402 (2015).

⁷³ See *supra* notes 3–5 and accompanying text.

⁷⁴ W. Michael Reisman, *International Incidents: Introduction to a New Genre in the Study of International Law*, 10 YALE J. INT’L L. 1, 12-15 (1984).

diplomats, interpret and apply the law, much like a judge in a common law system.⁷⁵ What Reisman's scholarship indicates is that the content of international law is a function of State interpretation which can be observed as States face unexpected incidents that reveal rifts in international law. These epistemic moments reveal the political construction of the law, as well as the extent to which States understand their own international obligations.⁷⁶

Reisman's work gives a lens to international law that takes us beyond the text of a treaty and into the construction of content across time and space. International incidents serve as glosses on the formal text of international law as found in treaties or custom. There is no need to limit these epistemic units to Reisman's "international incidents." International law is extremely amorphous in nature, and while the "text" of international law comes from traditional negotiations within international fora, the content of international law is often in the subtext derived from multiple points of informal negotiation.

Such processes are revealed in the academic interest in the formation of "soft law" in international space law.⁷⁷ Soft law comes in many forms, which are all understood to be non-binding agreements such as technical guidelines or best practices.⁷⁸ Soft law is indicative of the rhizomatic nature of norm development in international space law. The old model characterized by the active negotiation of treaties has increasingly given way to less formal mechanisms through which States are defining the nature of responsible behavior in space.⁷⁹ This does not mean that the well of

⁷⁵ *Id.* at 5–7.

⁷⁶ *See id.* at 2–3.

⁷⁷ For a sample of the literature on soft law and outer space activities, see generally IRMGARD MARBOE, *SOFT LAW IN OUTER SPACE: THE FUNCTION OF NON-BINDING NORMS IN INTERNATIONAL SPACE LAW* (2012).

⁷⁸ P.J. Blount, *Renovating Space: The Future of International Space Law*, 40 *DENV. J. INT'L L. & POL'Y* 515, 525–27 (2012).

⁷⁹ On the shifting nature of international space law making, see 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, 219–42 (2005).

space law has dried. Rather, it is indicative of numerous springs welling up and contributing to the flow of international space law.

Soft law and international incidents represent two of these types of sources. Specific to this article, domestic law and policy can be another source of law that States use to fill the gaps found in international law. An excellent example of this is the migration of “non-discriminatory access” to remote sensing data from domestic American law into the United Nations Principles on Remote Sensing.⁸⁰ In essence, States are still negotiating the content of international space law, but that “negotiation” is not happening in the formal sense of a diplomatic meeting of State parties. It is instead happening in an arena of complexity that might be more akin to a multidimensional chess game. In such an arena, States often interpret international law and pose that interpretation to the international community through domestic action. This “conversation” begins to mark the contours of the content of international law.⁸¹

As States work out the content of ambiguous terms in international law, State legislation plays an important role in revealing state interpretations of legal rights and obligations, especially when States enact legislation that is meant to comport with international law. In such scenarios, the legislation itself becomes an important epistemic unit in analyzing the content of

⁸⁰ See generally Joanne Irene Gabrynowicz, *The Perils of Landsat from Grassroots to Globalization: A Comprehensive Review of US Remote Sensing Law with a Few Thoughts for the Future*, 6 CHI. J. INT’L L. 45 (2005); JOANNE IRENE GABRYNOWICZ, *THE LAND REMOTE SENSING LAWS AND POLICIES OF NATIONAL GOVERNMENTS: A GLOBAL SURVEY* (2007), <http://www.olemiss.edu/programs/spacelaw/resources/pdfs/noaa.pdf>.

⁸¹ A good example of this is the interpretation of Article IX that was articulated through actions of China and the United States in the aftermath of their respective ASAT tests in 2007 and 2008. See K.K. Nair, *China’s ASAT Test: A Demonstrated Need for Legal Reform*, 33 J. SPACE L. 191, 191–94 (2007); Eugene Marder, Center For Defense Information, *CPR for the OST: How China’s Anti-Satellite Weapons Test Can Breathe New Life into Article IX of the Outer Space Treaty*, (2008) (on file with author); Michael C. Mineiro, FY-1C and USA-193 ASAT Intercepts: An Assessment of Legal Obligations Under Article IX of the Outer Space Treaty.” 34 J. SPACE L. 321, 455–57 (2008); P.J. Blount, *Developments in Space Security and Their Legal Implications*, 44 LAW/TECHNOLOGY 2, 30–36 (2011).

international law. This phenomenon is not native to space law. Domestic law making should not be confused with international law making in a formal sense, and this article does not argue that recent American legislation on extraterrestrial resource extraction constitutes international law. Instead, this article argues that the Act represents the United States' understanding of its obligations under Article II. This position places other States in the position of wrestling with these terms and determining whether the United States legislation is a valid interpretation of the Outer Space Treaty regime.

B. Reconciling the CSLCA with Article II of the Outer Space Treaty

The threshold question surrounding Title IV is whether the Act violates Article II of the Outer Space Treaty. The ambiguities that fragment Article II indicate multiple valid interpretations of the law and give no clear interpretation based in the text of international space law itself.⁸² In this light, the United States interpretation is not precluded by the text of the Treaty, especially in light of the careful language contained in the Act that acknowledges and incorporates the international obligations found in the Treaty itself. Indeed, the U.S. legislation specifically disclaims territorial sovereignty, which is tied directly to the non-appropriation principle in Article II.⁸³ It should be made clear, however, that a disclaimer of territorial sovereignty is not a disclaimer of national jurisdiction. National jurisdiction extends into all global commons through a variety of means and, in space, specifically through Article VI and Article VIII of the Outer Space Treaty.⁸⁴ The extension of jurisdiction is not a *de facto* extension of sovereignty, as can be seen in Article VIII of the Treaty which

⁸² See generally Int'l Inst. of Space Law, *Position Paper on Space Resource Mining*, (2015), <http://www.iislweb.org/docs/SpaceResourceMining.pdf>.

⁸³ See *supra* note 65 and accompanying text; U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114-90, § 402, 129 Stat. 704, 720-22 (2015), <https://www.congress.gov/114/plaws/publ90/PLAW-114publ90.pdf>.

⁸⁴ On jurisdiction in space, see generally P.J. Blount, *Jurisdiction in Outer Space: Challenges of Private Individuals in Space*, 33 J. SPACE L. 299 (2007).

affirmatively grants to States “jurisdiction and control” over spacecraft on their registries.⁸⁵

What this means is that this important concern in relation to Title IV is not *whether it violates international law* but instead, *what it tells us about the content of Article II*. This distinction focuses on Title IV as *a* valid interpretation of Article II but not necessarily *the* valid interpretation of Article II. As an epistemic unit in the negotiation of international law, Title IV is a State interpretation that raises questions of whether other States will accept the interpretation or not.⁸⁶ Contemporary geopolitics aside, if all other States decided to reject the United States interpretation as a rule of custom, they would force the United States to either capitulate or to maintain status as a persistent objector of sorts.⁸⁷ States are just as capable of coming together and forging agreements that make resource extraction subject to a regime such as the Deep Seabed Authority as contemplated in the Moon Agreement.⁸⁸ States can negotiate the particular legal structures governing specific activities in the outer space environment, thus indicating that Title IV’s importance will be measured in the extent to which the international community confirms or negates the American position. To date, there has been no outright diplomatic reaction.

Ultimately, the significance of Title IV, is in its ability to shape the future content of international space law. Since States are free to reject or accept the U.S. interpretation of Title IV, international reaction will be of the utmost importance. Unless States reject the interpretation, the howls of “illegality” coming from numerous academics will be like trees falling in empty woods. In short, Title IV can be read as the continuation of U.S. State practice in relation

⁸⁵ Outer Space Treaty, *supra* note 10, art. VIII.

⁸⁶ Position Paper, *supra* note 82.

⁸⁷ “Persistent objector” is a term associated with customary international law and not treaty law. The term here denotes an instance where a State refuses to accept the general interpretation of a treaty clause when the content is ambiguous subject to development through processes similar to the development of international custom (i.e. through the establishment of *opinio juris* and state practice).

⁸⁸ See Moon Agreement, *supra* note 2, art. 11.

to Article II. For instance, the plaque at the base of the American flag planted by the *Apollo 12* mission disclaims sovereignty, yet the United States extracted resources in the form of moon rocks and maintains ownership over those rocks.⁸⁹ Title IV extends a similar right to resource extraction without territorial claims to private actors. If other States do not contest this extension, then it is reasonable to interpret Title IV as legislation that represents a step towards defining the content of Article II and the law concerning the specific activity of space mining.

This does not mean that Title IV represents a settlement of the content of Article II. Indeed, Title IV does not even represent a final settlement of US domestic law in relation to extraterrestrial resource extraction as evinced by the reporting requirements on the proper regulatory regime to manage these activities.⁹⁰ Title IV does represent an incremental advance in our understanding of the international rights and obligations contained within the ambiguous text, and it may very well be an important epistemic point as commercial actors further imbricate themselves in use and exploration of outer space.

IV. DEVELOPING INTERNATIONAL LAW

If Title IV does become an accepted interpretation of Article II by States, then a number of issues will arise that must be addressed at the international level because the extension of State jurisdiction over commercial entities operating in outer space will require States to establish a regime through which these activities can be coordinated. This regime will be needed to, among other things, ensure safe and sustainable operations in space, to ensure commercial actors' investments in operations, and to maintain international peace and security in space activities. Title IV represents a possible avenue through which States may engage in cooperative efforts to preserve the Article II regime while at the

⁸⁹ *The Apollo 11 Memorial on the Moon*, NASA, http://starchild.gsfc.nasa.gov/docs/StarChild/space_level2/apollo11_plaque.html (last visited Nov. 5, 2016).

⁹⁰ U.S. Commercial Space Launch Competitiveness Act, Pub. L. 114-90 § 402.

same time facilitating the development of commercial resource extraction in outer space.⁹¹

As suggested above, one of the core goals of international law is to structure a stable and peaceful existence among States. As a result, States negotiate international law as sovereign equals that must balance between their own self-interests and the interests of the international community as a whole. States are often confronted with the need to address evolving technology and its tendency to challenge core questions of sovereignty. For instance, international telecommunications under the International Telecommunication Union (“ITU”) and international aviation under International Civil Aviation Organization (“ICAO”) are both examples of international collaboration on technical issues that carry political implications.⁹² These regimes represent the ability of States to adopt technical regimes that do not compromise the core principle of territorial sovereignty.

Space resource extraction presents a similar problem in that it begs the non-trivial question of the point at which an “exploration and use” of outer space becomes an appropriation through which a State has extended its sovereign territorial claims. This raises a question that was not fully contemplated in the post-1945 settlement.⁹³ Technology in 1945 was a challenge because it permeated borders, but space technology forced international law to contend with a new ability to extend borders. Article II is an attempt to “extraterritorialize” outer space and celestial bodies. States, in light of the uncertainties in evolving technologies, were unable to directly answer the limits of state power within a new, undefined global commons which results in the Article II ambiguities. It is submitted that there is no immediate need for States to resolve directly the limits of State power in outer space. This paper argues that the international community, without ever

⁹¹ The term “regime” in this context is used loosely and can be fulfilled through both formal and informal coordination mechanisms.

⁹² Notably, it has been argued that the ITU regulates orbital slots as space resources. See, e.g., Philip de Man, *Rights Over Areas vs. Resources in Outer Space: What’s the Use of Orbital Slots?* 38 J. SPACE L. 39 (2012).

⁹³ See Ctr. For Research of Air and Space Law, *supra* note 34 and accompanying text.

touching on problematic issues of sovereignty, can pursue mechanisms that could engender stability through international coordination. By focusing on technical standards and coordination of information sharing, such as that seen in ICAO or the ITU, States can engage in a cooperative regime that both secures outer space and facilitates its use and exploration.

Article VI of the Outer Space Treaty becomes critical in developing such a regime. If States agree at the international level on standards of conduct, then those standards can be implemented domestically through Article VI's authorization and supervision requirements.⁹⁴ For instance, safety standards create specific rules that guide responsible conduct and maintain predictability in a given environment. For example, though not explicitly classified as safety standards, the coordination process maintained by the ITU in regards to the geosynchronous orbit ultimately encourages responsible conduct and predictability in this sphere of outer space.⁹⁵ In the context of the ITU, this allows States to divorce political questions from that of safe operations, which allows them to explicitly avoid the implicit question of sovereignty and its fundamental ambiguities.

It is posited then, that in order to achieve the goals of security and sustainability in space *as well as* commercial uses of outer space, States will need to expand their cooperation in the field of technical safety standards and information sharing. This can, and likely will, develop incrementally from a variety of directions. The domestic legislation of various States will play a role by setting legal parameters for subsets of actors, and these laws will in turn formulate accepted practices maintained by certain operators. Indeed, the power of domestic legislation to create internationally accepted standards can be seen in the proliferation of the "maximum probable loss standard" from US law and into the laws

⁹⁴ The Federal Aviation Administration's letter to Bigelow Aerospace on payload review suggests such an approach. See Jeff Faust, *FAA Review a Small Step for Lunar Commercialization Efforts*, SPACE NEWS, (Feb. 6, 2015), <http://spacenews.com/faa-review-a-small-step-for-lunar-commercialization-efforts/>.

⁹⁵ LYALL & LARSEN, *supra* note 19, at 229-44.

of a variety of nations.⁹⁶ In addition to domestic legislation, States can also pursue law and policy options at the international level. This includes using mechanisms that increase information sharing such as the Hague Code of Conduct,⁹⁷ agreements that set out state best practices like the IADC Space Debris Mitigation Guidelines,⁹⁸ formal treaties, technical standards, and even international organizations. Indeed, this is the approach that was adopted by the United Nations Group of Governmental Experts, which endorsed the development of transparency and confidence building measures as critical to the continued safety and security of outer space.

Safety standards and information sharing facilitate routine interactions and decrease operational risk by increasing predictability. This decreases the risk of conflict through mishap in a high security environment. Not only do these standards increase security among States, but they also facilitate commercial enterprises by increasing certainty for commercial investors. As the need for coordination increases with the proliferation of actors and technologies, safety has the unique ability to serve as the common language through which States can maximize self-interest through international coordination.

⁹⁶ Maximum probable loss, which is the extent to which space launch providers need to obtain private insurance, is an innovation first developed in American law. It has been adopted and adapted by a number of States including Australia, Korea, and France. See Sara M. Langston, *Suborbital Flights: A Comparative Analysis of National and International Law*, 37 J. SPACE L. 299, 324, 353 (2011); Sang Myon-Rhee, *Current Status and Recent Developments in Korea's National Space Laws*, 35 J. Space L. 523, 535-36 (2009); A. Kerrest de Rozavel & F.G. von der Dunk, *Liability and Insurance in the Context of National Authorisation*, in *National Space Legislation in Europe: Issues of Authorisation of Private Space Activities in the Light of Developments in European Space Cooperation* 15 (2011), <http://digitalcommons.unl.edu/spacelaw/78>.

⁹⁷ Hague Code of Conduct Against Ballistic Missile Proliferation, http://www.hcoc.at/?tab=what_is_hcoc&page=text_of_the_hcoc (last visited October 22, 2016).

⁹⁸ *IADC Space Debris Mitigation Guidelines*, SPATIALIZATIONS LIBRARY (September 2007), <http://library.blountsfolly.com/space/files/original/1fcb7b753c13bab2f534bc55257f85aa.pdf>.

CONCLUSION

Since the bulk of companies that are seeking to take advantage of the new United States regulations are still decks of PowerPoint slides seeking funding, the nation is likely decades away from seeing the first resource extraction activities in outer space. This means that the debate over Article II and Title IV is likely to continue, but will ultimately be decided by the international community. Consequently, whether the United States interpretation is accepted or not will be important, but it is equally important to track how the law develops in other countries and specifically how these countries interpret their obligations under Article II.⁹⁹ Hopefully, spacefaring States will realize that mechanisms that drive international coordination, such as the development of routine safety standards, are the key components in maintaining international stability in the advent of extraterrestrial resource extraction. All things considered, Title IV is an important step forward, but it should not be overplayed as it still only represents “one small step” in this emerging sphere of space exploration. But with time, this one small step may eventually reflect “one giant leap” for the future of resource extraction in outer space.

⁹⁹ For example, one commentator has argued that the Austrian Mining Act is a “role model” for developing commercial exploitation within the framework of Article II. Anita Rinner, *Space Exploration—Digging in a Legal Vacuum*, 57 PROC. INT’L INST. SPACE L. 221, 228–29 (2014).