

Fly Me to the Moon  
and Let Me Mine  
an Asteroid

By Julie Randolph

**P**riate property rights to outer space resources are far from certain on the international stage. As asteroid mining comes closer to reality, knowing where they stand as countries pass their own legislation will be crucial.



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# A Primer on Private Entities' Rights to Outer Space Resources

The year 1967 saw the first human heart transplant, the first ATM, and the release of *Sgt. Pepper's Lonely Hearts Club Band*, all developments still relevant today (provided that you like The Beatles). 1967 saw another milestone

that remains relevant, if not as widely known: the Outer Space Treaty. On its 50th anniversary, not only is the Outer Space Treaty still in force, it is the crux of the debate over whether private, commercial ventures have the legal right to outer space resources.

For those who hope to mine asteroids or other outer space bodies, the Outer Space Treaty, strengthened by recent laws passed in the United States and Luxembourg, provides the legal backbone for their claims to extraterrestrial resources. But while these arguments and new laws have provided some comfort to investors, they are not without their skeptics. Such detractors believe that the Outer Space Treaty should be read in its historical context and that current international law makes such private property rights illegal, or at least subject to international regulation.

This is not an abstract argument; current investment in asteroid-mining ventures already numbers in the tens of millions of dollars, and at least one com-

pany predicts that it will be mining asteroids within the next 10 years. Mike Wall, *Asteroid Mining May Be a Reality by 2025*, Space.com, Aug. 11, 2015. This is also a legislatively active area. In the last year alone, congressional committees held two sets of hearings on the United States' obligations under the Outer Space Treaty, Luxembourg passed its own law on private rights to outer space resources, and delegates to the United Nations Committee on the Peaceful Uses of Outer Space session raised concerns about individual states' legislation in this area.

This article gives the reader an overview of the issues, documents, and history needed to understand the current debates over private rights to outer space resources. To that end, it will discuss the Outer Space Treaty and other treaties that address property rights in outer space, provide a brief history of United States legislative and executive actions related to commercial space ventures, look at current national and international legislation and views on

private property rights in outer space, and provide some insight into the future of extraterrestrial property rights. While this article does not purport to answer whether private companies have property rights in resources in space, it provides resources to assess that question—and others’ answers to the question.

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**The Outer Space Treaty and the Moon Treaty**

Arguments over how to interpret the provisions in the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, (better known as the Outer Space Treaty), Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205, frequently cite the circumstances of the treaty’s creation, so some background is in order.

The road to the Outer Space Treaty began early in the history of human space exploration, as spacefaring nations quickly recognized the need to foster peace in outer space. Even before the Soviet Union’s October 1957 Sputnik launch, the United States had proposed an outer space inspection system. U.S. Dept. of State, Narrative to Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies. In September 1963, both the United States and the Soviet Union separately advised the United Nations General Assembly that neither intended to send nuclear weapons into space. *Id.* The path toward an inter-

national understanding on appropriate space activity thus began.

The United States and the Soviet Union continued to build on this foundation, and in 1966, both countries submitted draft treaties to the U.N. General Assembly. *Id.* Although the Soviet version had not accommodated non-governmental space endeavors, as part of the negotiations, the Soviet Union allowed the United States to include language concerning private space ventures. See *Regulating Space: Innovation, Liberty, and International Obligations, Hearing Before the H. Comm. on Science, Space and Technology Subcomm. on Space*, 115th Cong. (2017) (statement of Dennis J. Burnett, Adjunct Professor, University of Nebraska, College of Law 6 & n.9). The treaty’s centerpiece is Article IV, which prohibits placing nuclear weapons or other weapons of mass destruction in outer space.

By the end of 1966, the two countries reached accord on all treaty provisions, and on January 27, 1967, the United Nations opened the Outer Space Treaty for signature. U.N. Comm. on the Peaceful Uses of Outer Space, Status of International Agreements Relating to Activities in Outer Space as of 1 January 2017 1 (Mar. 23, 2017), available at <http://www.unoosa.org>. The treaty entered into force on October 10, 1967. *Id.* To date, over 100 states, including all current space-faring nations, have ratified or otherwise approved the treaty. *Id.* at 12.

The Outer Space Treaty contains numerous articles of interest to commercial space enterprises. Most significant to those interested in exploiting space resources is Article VI, which recognizes that private entities can engage in outer space activity, subject to national authorization and supervision:

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authoriza-

tion and continuing supervision by the appropriate State Party to the Treaty... Additional Outer Space Treaty terms bar national appropriation of outer space, including the moon and other celestial bodies (Article II). States parties are required to render emergency assistance to astronauts (Article V); conduct exploration in a way that will not contaminate celestial bodies or adversely affect the Earth’s environment (Article IX); and with advance notice, open all stations and vehicles on celestial bodies to other states parties’ representatives (Article XII). Whether and how these provisions apply to private spacefaring entities play a part in the debate about private entities’ rights and responsibilities in outer space.

Nowhere does the Outer Space Treaty prohibit the exploitation of resources found on celestial bodies; instead, Article I states: “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...”

In contrast, the 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (better known as the Moon Treaty) extends the Outer Space Treaty’s prohibitions against national appropriation of the moon and other celestial bodies by prohibiting national or private rights to resources extracted from them:

1. The moon and its natural resources are the common heritage of mankind....
- ...
3. Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or nongovernmental organization, national organization or non-governmental entity or of any natural person.
- ...
6. ... States Parties shall inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of any natural resources they may discover on the moon.

7. The main purposes of the international régime to be established shall include:

...

(d) An 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.

Dec. 18, 1979, 1363 U.N.T.S. 3. Note that although the language in most of the Moon Treaty references the moon, Article 1 clarifies that the treaty provisions relating to the moon also apply to other celestial bodies in our solar system, excepting the Earth.

Given these prohibitions and the requirement to share resources with all signing nations (spacefaring or not), it is unsurprising that *no* spacefaring nation has signed the Moon Treaty. U.N. Comm. on the Peaceful Uses of Outer Space (Mar. 23, 2017), *supra*, at 12.

### Overview of United States Executive and Legislative Treatment of Commercial Space Activity

On the domestic side, the United States has long promoted partnership between government and commercial space ventures. Only recently, however, has the United States explicitly recognized and moved to protect private entities' interests in extra-terrestrial resources. Currently, the U.S. government is grappling with how commercial space ventures should be authorized and supervised, including whether current licensing schemes can encompass these ventures or if a new scheme is needed. Knowing how this partnership with and regulation of private industry has evolved and currently is managed aids understanding of the current conversation on whether the United States is meeting its international obligations after the U.S. Congress passed the Commercial Space Launch Competitiveness Act of 2015.

One of the first American legislative acts concerning private entities, the Communications Satellite Act of 1962, created a private corporation with the purpose of establishing a commercial commu-

nications satellite system. Pub. L. 87-624, 76 Stat. 419 (1962) (current version at 47 U.S.C. §§701-44 (2017)). The 1962 act's stated reasons for using a private corporation include "to provide for the widest possible participation by private enterprise." *Id.* at §102(c).

In his remarks on the 1962 act's signing, President John F. Kennedy reiterated the importance of the private industry partnership with the government, stating that creating the satellite communications system would "be accomplished though the joint efforts of private individuals and concerns, and agencies of the Federal Government." Remarks on H.R. 11040, Communications Satellite Act of 1962 (Aug. 31, 1962). President Kennedy was a strong believer in private enterprise's role in outer space, and his vision set the tone for future presidencies.

This nascent idea—that partnership between the federal government and private industry would improve the United States' space program—echoes through later legislation and executive statements. Two other themes sound throughout: some regulation of commercial, private ventures is necessary to conform to international treaties and to protect national security, and collaboration with private entities creates various economic benefits, whether saving the government money, or encouraging the national economy through technological developments.

In 1978, President Jimmy Carter signed Presidential Directive/NSC-37, articulating his "National Space Policy." The released, unclassified version includes a direction to the civil space program to support private ventures: "The United States shall encourage domestic commercial exploitation of space capabilities and systems for economic benefit and to promote the technological position of the United States" with appropriate authorization and regulation.

President Ronald Reagan issued his National Space Policy in 1982. Similar to the 1978 policy that it superseded, the 1982 policy's released, unclassified version included a direction to support private ventures, subject to restrictions: "The United States Government will provide a climate conducive to expanded private sector investment and involvement in civil space activities.... Private sector space activities will be authorized and supervised or regulated by the government to the extent

required by treaty and national security." National Security Directive, National Space Policy, NSDD-42 §III(4)B (July 4, 1982).

In February 1988, President Reagan issued a new National Space Policy directive. The 1988 policy contained stronger language than its predecessors on governmental support for private space ventures: "Governmental Space Sectors *shall* pur-

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chase commercially available space goods and services to the fullest extent feasible.... Commercial Sector space activities shall be supervised or regulated *only* to the extent required by law, national security, international obligations, and public safety." Presidential Directive on National Space Policy (Feb. 11, 1988) (emphasis added).

The presidential interest in space—including commercial space ventures—continued unabated for the next several years. President George H. W. Bush issued various directives and policies encouraging commercial space programs. Legislation and executive agency actions tried to keep pace with presidential vision, with an emphasis on simplifying licensing. One important example is the Commercial Space Act of 1998, which President William J. Clinton signed into law on October 28, 1998. Commercial Space Act of 1998, Pub. L. 105-303, 112 Stat. 2843 (codified in scattered sections of 51 U.S.C. (as amended)) (2017).

The 1998 act moved many responsibilities under the NASA Administrator and shifted some traditional governmental responsibilities to the private sector. These governmental efforts yielded fruit: between 1989 (when the first licensed launch occurred) and April 1999, 110 licensed commercial space launches took place. Commercial Space Transportation Licensing Regula-

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tions, 64 Fed. Reg. 19586, 19587 (Apr. 21, 1999) (to be codified at 14 C.F.R. §§401, 411, 413, 415, and 417).

After a brief lull in executive and legislative commercial space flight action, Congress passed the Commercial Space Launch Amendments Act of 2004, which addressed issues associated with increased human space activity, and directed that the language “the goal of safely opening space to the American people and their private commercial, scientific, and cultural enterprises should guide Federal space investments, policies, and regulations” be included in 49 U.S.C. §70101. Commercial Space Launch Amendments Act of 2004, 108 Pub. L. 492 §2(a)(5), 118 Stat. 3974, 3974–75, 51 U.S.C. §§50901-22 (as amended) (2017). In 2006, President George W. Bush issued an unclassified version of his National Space Policy, which largely repeated its predecessors’

language concerning commercial space flight and emphasized that the government should work with industry on appropriate licensing measures, requiring government departments and agencies to “[m]aintain a timely and responsive regulatory environment for licensing commercial space activities.” U.S. National Space Policy §7 (Aug. 31, 2006), available at <http://history.nasa.gov>.

United States law and executive actions thus have supported commercial space activity for more than 70 years, with a constant eye toward its potential benefits to both government programs and the American economy as a whole. It was not until the past few years, however, that the United States government outlined these commercial ventures’ property rights.

### Recent United States Legislation

In a 2010 speech, President Barack Obama articulated his vision for space exploration, which included increased commercial service use as a means to cut costs and accelerate innovation. Remarks by the President on Space Exploration in the 21st Century (Apr. 15, 2010), available at <https://obamawhitehouse.archives.gov>. In the following years, Congress began work on new commercial space flight legislation. In May 2015, the House Committee on Science, Space, and Technology’s Report on H.R. 2262 described several perceived shortcomings in the existing legislative regime. H. Rept. 114-119 (May 18, 2015).

Meanwhile, private companies, including Planetary Resources, Deep Space Industries (DSI), and Moon Express, urged Congress to create legal certainty regarding their rights to the outer space resources they hope to extract. Matthew Shaer, *The Asteroid Miner’s Guide to the Galaxy*, Foreign Policy, Apr. 28, 2016. These efforts led to Congress introducing the Asteroids Act of 2014 and the similar Space Resource Exploration and Utilization Act of 2015. H.R. 5063, 113th Cong. (2014); H.R. 1508, 114th Cong. (2015); S. 976, 114th Cong. (2015). Both bills sought to confer property rights in asteroid resources to any entity obtaining those resources “consistent with applicable provisions of Federal law.” H.R. 5063 §51302(a); S. 976 §51303(a). In addition, the bills laid out the framework for civil actions for relief from harmful interference, including a rule of decision in favor of plaintiffs if the activity was reason-

able and a plaintiff acted in accordance with the United States’ international obligations and conducted the activity first. H.R. 5063 §51302(b), (d); S. 976 §51303(c), (d).

The U.S. Commercial Space Launch Competitiveness Act of 2015 (the Space Act) was Congress’s attempt to remedy these perceived legislative shortcomings (and others) in the interest of making American private space ventures more competitive internationally. 51 U.S.C. §§50101-303 (2016). Significantly, the Space Act also again enacted into law the Asteroids Act’s and the Space Resource Exploration and Utilization Act’s grant of asteroid resource rights:

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.

*Id.* §51303.

The Space Act, however, did not include the earlier bills’ sections concerning civil actions and harmful interference. Instead, it tacks on an additional “Disclaimer of Extraterritorial Sovereignty” 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.” H.R. 2262 §403.

Congress appears to have assumed that granting private companies rights to outer space resources does not per se violate any international obligations. The Space Act’s concerns, at least with regard to treaty compliance, are with ensuring the government provides sufficient authorization and supervision (an allusion to the Outer Space Treaty’s language on state supervision of private entities), not whether such property rights are permitted in the first place. Section 108 of the Space Act only requires that the director of the Office of Science and Technology Policy, in consultation with various secretaries in the executive branch, “recommend an authorization and supervision approach that would prioritize safety, utilize existing authorities, minimize burdens to the industry, promote

the U.S. commercial space sector, and meet the United States obligations under international treaties.”

Under section 108, the Office of Science and Technology Policy issued a letter report on April 4, 2016. John P. Holdren, Director, Office of Science and Technology Policy, to John Thune, Chair, U.S. Senate Committee on Commerce, Science, and Transportation, and Lamar Smith, Chair, House Science, Space, and Technology Committee (Apr. 4, 2016), *available at* <https://obamawhitehouse.archives.gov/>. The report recognized congressional interest in new American commercial space activities, including using space resources. With regard to these activities, the Office of Science and Technology Policy reiterated the United States’ responsibilities under the Outer Space Treaty, particularly states parties’ responsibility for national activities, and noted that most spacefaring countries fulfilled this obligation by licensing private space activities. *Id.* The Office of Science and Technology Policy believed that the current United States licensing activities did not discharge its treaty obligations for these new commercial space activities and recommended implementing an inter-agency “Mission Authorization” process to review these new space mission types. The Office of Science and Technology Policy letter did not, however, question whether private rights to asteroid resources create greater legal problems than implementing sufficient authorization and supervision.

This past year, committees in both the U.S. House of Representatives and the U.S. Senate held hearings about what measures, if any, were needed to meet the United States’ international obligations. The witnesses’ statements uniformly supported private rights to space resources and, similar the Space Act’s section 108, focused on what authorization and supervision of private entities are necessary to meet the United States’ international obligations.

In addition, this October, the White House Space Council expressed interest in a more ambitious U.S. space agenda, which includes partnerships between government and private space entities. Andy Pasztor, *Vice President Pence Says U.S. Wants to Return Humans to the Moon*, Wall St. J., Oct. 6, 2017. The council’s actions will be worth watching.

### Luxembourg’s New Space Resource Legislation

The United States is not alone in passing national legislation conferring property rights in outer space resources to private entities. Luxembourg, which has long maintained an interest in outer space activity, was the second country to pass space resource legislation. On July 13, 2017, Luxembourg adopted the Draft Law on the Exploration and Use of Space Resources. Mémorial A No. 674, Loi du 20 juillet 2017 sur l’exploration et l’utilisation des ressources de l’espace, doc. Parl. 7093 (2016-2017). Luxembourg’s law starts with a definitive statement of private rights to space resources: “Les ressources de l’espace sont susceptibles d’appropriation.” (“Space resources are capable of being appropriated.”). *Id.* art. 1. Similar to the United States Space Act, it shows no qualms about conferring space resource property rights to private entities. SpaceResources.lu, Commercial Uses, *available at* <http://www.spaceresources.public.lu>.

The Luxembourg space law does differ from the United States Space Act in its particulars, however. Luxembourg’s legislation goes into great detail about the authorization process, including establishing the need to receive ministerial authorization for space exploration and resource use, the factors to be considered in granting the authorization, a requirement for a risk assessment and regular audits, and fee ranges. And while the United States Space Act confers property rights only to United States citizens, the Luxembourg law extends to various types of companies registered in Luxembourg.

Luxembourg is leveraging its space-mining law to attract space business, touting the certainty that the legislation creates for companies and investors. SpaceResources.lu, Commercial Resources. Luxembourg’s efforts to accommodate space mining ventures appear to be working: Planetary Resources has formed partnerships with Luxembourg, and DSI has established its European headquarters there.

### So Where’s the Disagreement?

The United States’ apparent certainty about the existence of private property rights in outer space resources and its own ability to create national legislation conferring these

rights has not been without its critics—and its defenders—both inside and outside the United States. These arguments have played out in public hearings, academic journals, space-focused podcasts, and the popular press. Both sides point to the Outer Space Treaty’s language, finding support in its language and its context.

Private rights proponents find sup-



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port in the Outer Space Treaty’s recognition of non-governmental activity in space and to the absence of prohibitions against resource appropriation. *See, e.g., Sagi Kfir, Is Asteroid Mining Legal?, Deep Space Industries, available at* <https://deepspaceindustries.com>. The International Institute of Space Law, among others, has concluded that as long as the United States complies with the Outer Space Treaty’s obligations, it appears the United States may legislate within this regulatory gap. Int’l Inst. of Space Law, Position Paper on Space Resource Mining (Dec. 20, 2015), *available at* <https://iislweb.org>. *See also Reopening the American Frontier: Exploring How the Outer Space Treaty Will Impact American Commerce and Settlement in Space, Hearing Before the S. Comm. on Commerce, Science, & Transportation Subcomm. on Space, Science, and Competitiveness*, 115th

Cong. (2017) (statement of Matthew P. Schaefer, Veronica A. Haggart & Charles R. Work Professor of International Trade Law, University of Nebraska College of Law). Some proponents argue that the Outer Space Treaty's language on "use" proves that the Outer Space Treaty never meant to limit space resource exploitation. See Kfir, *supra*. In addition, proponents point

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to the Moon Treaty's failure to gain wide support as demonstrating that spacefaring nations rejected the Moon Treaty's stance that outer space resources cannot be appropriated by governments or private entities. As a result, they argue, its prohibitions concerning space resource use do not apply to non-signatories and should not be read into the Outer Space Treaty. See, e.g., John Myers, *Extraterrestrial Property Rights: Utilizing the Resources of the Final Frontier*, 18 San Diego Int'l L.J. 77, 124 (2016).

Critics also take several approaches in opposing the legality of private rights to outer space resources. First, opponents point to the Outer Space Treaty's Article I language, which states that "[t]he exploration and use of outer space... shall be carried out for the benefit and in the interests of all countries." Such language, they argue, indicates that the Outer Space Treaty intends space resources for the benefit of all mankind, not for private

profit. See, e.g., Fabio Tronchetti, *The Space Resource Exploration and Utilization Act: A Move Forward or a Step Back?*, 24 Space Policy 6, 8 (2015); Gbenga Oduntan, *Who Owns Space? US Asteroid-Mining Act Is Dangerous and Potentially Illegal*, The Conversation.com (2015). Second, some commentators believe that even though the United States has not ratified the Moon Treaty, its provisions—including its statement that outer space resources cannot become the property of any government or private entity—apply to all countries. Professor Gbenda Oduntan, for one, argues that the Moon Treaty "is binding as customary international law." *Id.* Other commentators, noting the connections between the two treaties, have looked to the Moon Treaty in interpreting the Outer Space Treaty's provisions. Using this approach, some argue that the Moon Treaty clarifies that the Outer Space Treaty's "use" language means use for the benefit all nations, and not for unilateral, private benefit. See, e.g., Marina Lits, Sergei Stepanov, & Anna Tikhomirova, *International Space Law*, 4 BRICS L.J. 135, 150–52 (2017).

Professor Fabio Tronchetti raises an additional, interesting argument based on property law. The Outer Space Treaty's Article II prohibits national appropriation of outer space bodies. Tronchetti argues that nations may not confer property rights that they do not possess. Fabio Tronchetti, *Private Property Rights on Asteroid Resources: Assessing the Legality of the ASTEROIDS Act*, 30 Space Policy 193 (2014). By conferring property rights in asteroid resources, he concludes, the United States in essence is declaring that it has property rights to that asteroid, which violates Article II. *Id.* at 194.

The United Nations Committee on the Peaceful Uses of Outer Space (COPOUS) and its Legal Subcommittee have been gathering feedback from national representatives about how to move forward in the face of national legislation in this area. Views raised by the Legal Subcommittee delegates varied widely, sometimes conflicting or overlapping with one another, but included the following:

- An analysis should be conducted of the Outer Space Treaty and Moon Treaty's principles, to determine states' rights regarding outer space resources.

- A multilateral or international approach should be taken with regard to space resources.
- Developing countries and consideration of their rights should be included in the space resources debate.
- Multiple, national initiatives would create multiple incompatible national frameworks, which could lead to conflicts.
- National legislation on space resources currently conforms with international treaty obligations and 50 years of national practice.
- Rushing to a solution, given that activities exploiting space resources will not happen in the term, is not the best approach.

U.N. Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., *Report on Its 56th Session, Held in Vienna from 27 March to 7 April 2017*, ¶¶ 221-50, U.N. Doc. A/AC.105/1122 (Apr. 18, 2017), available at <http://www.unoosa.org>.

In its report from its Sixtieth Session, COPUOS cited the Legal Subcommittee's report and referred to some of the views supporting taking a multilateral or international approach to the issue, but included none supporting national legislation conferring private property rights to outer space resources. U.N. Comm. on the Peaceful Uses of Outer Space, *Report of the Committee on the Peaceful Uses of Outer Space, Sixtieth Session* (June 7–16, 2017), ¶¶ 227–37, U.N. Doc. A/72/20 (June 27, 2017), available at <http://www.unoosa.org>.

Some commentators have analogized the development of outer space resources law to the development of the high seas law. After significant resources were discovered in the high seas (over which no nation can claim sovereignty), seafaring nations competed for them, leading to conflicts and disagreements over resource rights. This eventually culminated in the Convention on the Law of the Sea. See United Nations, *The United Nations Convention on the Law of the Sea (A Historical Perspective)*, available at <https://www.un.org>. Even though the United States is not a signatory to the Convention on the Law of the Sea, it has created its own agreements with other nations concerning deep seabed resources. Myers, *supra*, at 126. As a result, nations license private entities to mine the deep seabed, with international

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acceptance of this practice, and perhaps, if international consensus were attained, such a model could be applied to outer space resources as well. See Grant Gerlock, *Asteroid Mining Plans Reveal Legal Black Hole* (interview with Frans von der Dunk, Professor of Space Law, University of Nebraska-Lincoln), KVNO News (May 5, 2012).

Along these lines, there is interest in moving past the Outer Space Treaty and forming a new international understanding or framework on outer space resources. See, e.g., National Space Society, Podcast: *Voices from L5—New Space, The Outer Space Treaty and Lucite Balls* (interview with Michael Listner, Founder of Space Law & Policy Solutions) (2016). For example, the Hague Space Resources Working Group, a group of international members and observers hosted by a consortium of which the principle partner is the International Institute of Air and Space Law at Leiden University, recently released a draft of “building blocks” for use in an international agreement or instrument. Others, however, flatly reject this approach. James Dunstan and Berin Szoka of the think tank TechFreedom have argued that opening the Outer Space Treaty to amendment or augmentation “inevitably” would result in a treaty that would have provisions, as does the Moon Treaty, that are “antithetical to U.S. economic interests,” and retired astronaut Pamela Melroy likened any attempts to alter the Outer Space Treaty to “opening a Pandora’s Box.” *Reopening the American Frontier: Exploring How the Outer Space Treaty Will Impact American Commerce and Settlement in Space*, Hearing Before the S. Comm. on Commerce, Science, & Transportation Subcomm. on Space, Science, and Competitiveness, 115th Cong. (2017) (written testimony of James E. Dunstan, Senior Adjunct Fellow, TechFreedom & Berin Szoka, President, TechFreedom & written testimony of Pamela A. Melroy, NASA Astronaut, retired).

This does not mean that nations with legislation supporting private property rights necessarily would reject an international regulatory scheme, provided that it is one with which they agree. Luxembourg has stated that it is working with various national and international bodies in pursuit of such a framework. SpaceResources.lu, Luxembourg’s Framework, *available at*

<http://www.spaceresources.public.lu>. Some United States commentators have noted that the United States’ early actions in space resource legislation have positioned the United States as a leader in this area, potentially creating precedent for international efforts. Dunstan & Szoka, *supra*, at 5; *Regulating Space: Innovation, Liberty, and International Obligations*, Hearing Before the H. Comm. on Science, Space and Technology Subcomm. on Space, 115th Cong. (2017) (statement of Douglas L. Loverro, former Deputy Assistant Secretary of Defense for Space Policy, 9–10).

As these arguments demonstrate, private property rights to outer space resources are far from certain on the international stage. As asteroid mining comes closer to reality, more nations may begin to create their own legislation—or to advocate for an international regime. Knowing some of the legal background leading to this point will help investors, attorneys, and others involved in space resource exploration and exploitation to assess their risks and evaluate both supporters’ and detractors’ stances. This is a fascinating, fast-moving area that deserves more than a passing glance. 