

ARGONAUTS AND ASTRONAUTS: EXAMINATION OF THE
STATUS OF PROPERTY RIGHTS IN ASTEROID MINERALS AND
PROPOSED SOLUTION

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INTRODUCTION

In 1972, astronaut Eugene Cernan became the last human being to touch the surface of our celestial sister, the moon, marking what some consider to be the summit of mankind's endeavors in outer space. The 1950s and 1960s saw an incredible increase in mankind's knowledge and technological abilities in outer space. But this increase took place against a background of rapid armament and military tensions between the United States and the Soviet Union. As a result, the hastily drafted international legal framework governing outer space reflects a desire to prevent either Cold War superpower from using the final frontier for military superiority. In an era during which space was the exclusive domain of large governments and flight systems had less computing power than today's smartphones, lawmakers were unable to foresee a future in which the private commercialization of space was not only technologically feasible but also hugely profitable. But that future has arrived, and an array of well-financed corporations stand poised to launch space-based commercial ventures. Although space tourism has received significant media attention, another burgeoning industry holds the potential for far greater profits. The mining of asteroids is no longer the stuff of science fiction, and several asteroid mining ventures will be ready to launch successful missions as early as 2025. However, these missions will not take place in the absence of a modernized regulatory system that clarifies property rights and liabilities in outer space. Part One of this Note will detail the benefits space mining could provide to humanity and the importance of a system to protect property rights in space. Part Two will provide an overview of relevant international and domestic law, and outline the current status of celestial property rights. Part Three will explore how the United States can move forward in order to position itself to enjoy all the benefits of asteroid mineral extraction.

I. WHY MINE ASTEROIDS? WHAT'S THE HOLDUP?

Scientists predict that, within the next century, the Earth's reserves of platinum, zinc, copper, phosphorous, lead, and gold—all examples of minerals necessary for modern industry—could be exhausted.¹ However, it is currently believed that these elements exist in large quantities in asteroids.² Of the approximately 8,000 discovered Near Earth Asteroids

1. Lauren E. Shaw, *Asteroids, The New Western Frontier: Applying Principles of the General Mining Law of 1872 to Incentivize Asteroid Mining*, 78 J. AIR L. & COM. 121, 125 (2013).

2. Matthew Feinman, *Mining the Final Frontier: Keeping Earth's Asteroid Mining Ventures from Becoming the Next Gold Rush*, 14 U. PITT. J. TECH. L. & POL'Y 202, 202 (2014).

(NEAs), over 1,200 pass so close to the Earth that they are tracked as Potentially Hazardous Asteroids (PHAs).³ Many of the larger NEAs and especially PHAs could be mined for massive profits; one rich NEA, NEA 1986 DA, is estimated to contain between \$6 and \$7 trillion worth of gold, platinum, iron, and nickel.⁴ Aside from the initial value of these resources on the world market, mining the additional resources from asteroids would lower manufacturing costs in other sectors by eliminating the necessity of expensive recycling after Earth's resources are exhausted.⁵ Perhaps most importantly, asteroids are believed to be a viable source of water,⁶ which experts predict will become increasingly scarce in the near future.⁷ The United States should place itself in a position to benefit from the exploitation of these resources by incentivizing commercial asteroid mining.

Asteroids also contain large amounts of hydrogen and helium, which are considered excellent potential sources of rocket fuel.⁸ The water contained in asteroids can be easily converted to hydrogen fuel through the use of solar power.⁹ Therefore, asteroids may serve as refueling stations allowing mankind to launch manned missions greater distances than ever before.¹⁰

Since the Cold War and the Space Race, technology discovered in the course of space research has improved the quality of human life across the globe.¹¹ During the Space Race, the two competing superpowers' desire to out-do one another ensured that large amounts of money were dedicated to space technologies.¹² But since the 1950s, the private sector has played an ever-widening role in space, and this trend has continued with support from the Obama Administration.¹³ By incentivizing commercial asteroid mining, the United States could reap the benefits of space technology research dollars without significant taxpayer expense.¹⁴ Incentive need not be in the form of tax-funded subsidies; rather, since U.S.-based asteroid mining

3. Andrew Tingkang, *These Aren't the Asteroids You Are Looking For: Classifying Asteroids in Space as Chattels, Not Land*, 35 SEATTLE U. L. REV. 559, 566–67 (2012).

4. *Id.* at 566.

5. Shaw, *supra* note 1, at 125.

6. Tingkang, *supra* note 3, at 568.

7. Peter H. Gleick, *Water in Crisis: Paths to Sustainable Water Use*, 8 ECOLOGICAL APPLICATIONS 571, 571 (1998).

8. Tingkang, *supra* note 3, at 568.

9. Feinman, *supra* note 2, at 204.

10. Tingkang, *supra* note 3, at 568.

11. Joanne Irene Gabrynowicz, *Space Law: Its Cold War Origins and Challenges in the Era of Globalization*, 37 SUFFOLK U. L. REV. 1041, 1052 (2004).

12. Joanne Irene Gabrynowicz, *One Half Century and Counting: The Evolution of U.S. National Space Law and Three Long-Term Emerging Issues*, 4 HARV. L. & POL'Y REV. 405, 423 (2010).

13. *Id.* at 424–25.

14. Shaw, *supra* note 1, at 136.

companies have already acquired private financing, the basic incentive of providing the protections of property law to the industry could be enough to catalyze the industry into action.

In recognition of the importance of space-based industries, Congress has already passed 51 U.S.C. § 20102, which provides that “the general welfare of the United States requires that the Administration seek and encourage, to the maximum extent possible, the fullest commercial use of space.”¹⁵ House Bill 5063, which is currently before the Subcommittee on Space, would create the American Space Technology for Exploring Resource Opportunities in Deep Space Act, or ASTEROIDS Act.¹⁶ If passed, this legislation would require the President to “facilitate the commercial exploration and utilization of asteroid resources,” and “promote the right of United States commercial entities to explore and utilize resources from asteroids in outer space.”¹⁷

House Bill 5063 also weakly addresses property rights, perhaps the largest legal obstacle currently faced by space mining companies.¹⁸ In order to ensure that companies are willing to make the huge and risky investments required to create technology and launch mining missions, companies must be reasonably certain of the likelihood that their investment will be profitable.¹⁹ However, there presently exists no law that clearly protects companies’ rights to claim an asteroid or minerals extracted from it as property.²⁰ This legal void has produced what some scholars have called a reverse tragedy of the commons, since no party can claim use of the resource.²¹ House Bill 5063 attempts to address this issue by stating, “Any 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.”²² Although at first glance this provision might seem an easy answer to the property rights question, the Bill is unlikely to pass *because* it is an easy answer to the question.²³ The protection of property rights in outer space will likely require much more nuanced treatment to address concerns

15. 51 U.S.C.A. § 20102(c) (2012).

16. H.R. 5063, 113th Cong. (2014).

17. *Id.*

18. *Id.*

19. Shaw, *supra* note 1, at 132.

20. *Id.*

21. Tingkang, *supra* note 3, at 575.

22. H.R. 5063.

23. From discussions with Professor Joanne Irene Gabrynowicz, space law scholar. The measure is unlikely to pass because it represents a gloss over the detailed issues of international treaty law. It also represents a circular attempt at a solution, since applicable provisions of federal treaty law *might* deny property rights.

both domestic and international.²⁴ Nevertheless, the clarification and protection of property rights in space is an essential task which must be completed in order for the United States to enjoy the benefits extraterrestrial mining will produce.²⁵

II. ASTRONAUTS V. COSMONAUTS, NOT ASTRONAUTS AND ARGONAUTS

At the core of international space law sits the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, known commonly as the Outer Space Treaty.²⁶ Comprised of seventeen articles, the Outer Space Treaty covers issues ranging from the militarization of space to national liability for space launch problems.²⁷ However, there are several ambiguities in the treaty. Negotiated and enacted at the height of the Cold War and the Space Race, the ambiguity of the treaty's language reflects the urgency to establish international space law before either superpower could gain a foothold on the moon.²⁸ In fact, its passage was marked with such an ethos of crisis that President Lyndon Johnson asked Supreme Court Justice Arthur Goldberg to step down in order to negotiate the treaty on behalf of the United States.²⁹ The extent to which the Outer Space Treaty was enacted for Cold War era, anti-military purposes is evinced by the treaty's prohibitions: no military installations on celestial bodies, no weapons testing on celestial bodies, no military maneuvers on celestial bodies, no nuclear weapons in space, no weapons of mass destruction in space, etc.³⁰

Nevertheless, several provisions of the Outer Space Treaty are relevant to commercial asteroid mining.³¹ Article I sets forth that "exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries . . . and shall be the province of all mankind."³² Article II continues, "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."³³ Finally, Article VI holds State Parties to the Treaty

24. *Id.*

25. David Johnson, *Limits on the Giant Leap for Mankind: Legal Ambiguities of Extraterrestrial Resource Extraction*, 26 AM. U. INT'L L. REV. 1477, 1481 (2011).

26. Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty]; Gabrynowicz, *supra* note 8, at 1042.

27. Johnson, *supra* note 25, at 1485.

28. *Id.* at 1486.

29. Gabrynowicz, *supra* note 8, at 1042.

30. *Id.* at 1043.

31. Johnson, *supra* note 25, at 1488.

32. Outer Space Treaty, *supra* note 26, at art. I.

33. *Id.* at art. II.

liable and responsible for the space-related activities of non-governmental actors.³⁴

Four other international space treaties from the Cold War era are also still in force: the Convention on International Liability for Damage Caused by Space Objects³⁵ (Liability Convention); the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space³⁶ (Rescue and Return Agreement); the Convention on Registration of Objects Launched into Space³⁷ (Registration Convention); and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies³⁸ (Moon Treaty). Although this treaty regime has played a large role in shaping international space law, only the Liability Convention and the Moon Treaty bear significant relevance to this Note since these are the only treaties that even tangentially touch upon space mining and property rights. The Liability Convention continues to reflect the Cold War imagined phantom of a world with two spacefaring, hostile superpowers by creating a pro-victim, absolute liability regime for damage caused by space objects.³⁹ Although the Liability Convention applied to the crash of Soviet 945 on Canadian Soil, the enforcement mechanism was never tested as the Soviet Union and Canada negotiated a settlement without invoking the convention.⁴⁰

The Moon Treaty, specifically Article 11, was the only Cold War era space treaty to directly address resource extraction from a celestial body. Article 11 of the Treaty begins by declaring that “[t]he moon [and other celestial bodies] and [their] natural resources are the common heritage of mankind.”⁴¹ Sections 2 and 3 of Article 11 echo the Outer Space Treaty by prohibiting nations from claiming sovereignty over celestial bodies.⁴² The remainder of Article 11 calls for the establishment of an international governing body to ensure that resources extracted from the moon benefit all nations party to the Moon Treaty, regardless of whether those nations contributed to moon exploration, mining, or were even spacefaring.⁴³ However, the spacefaring nations have not joined the Moon Treaty, likely as a result of the resource extraction limiting nature of Article 11.⁴⁴

34. *Id.* at art. VI.

35. Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter Liability Convention].

36. Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue and Return Agreement].

37. Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention].

38. Dec. 18, 1979, 1363 U.N.T.S. 3, 18 I.L.M. 1434 [hereinafter Moon Treaty].

39. Gabrynowicz, *supra* note 11, at 1043–44.

40. *Id.* at 1044.

41. Moon Treaty, *supra* note 38, at art. 11(1).

42. *Id.* at art. 11(2–3).

43. *Id.* at art. 11(4–8).

44. Johnson, *supra* note 25, at 1487.

Because the Moon Treaty is only binding upon party nations, it would pose no restriction upon United States-based asteroid mining companies.⁴⁵ But the Moon Treaty, as part of the Cold War-era international space treaty regime, may shed light on provisions of the Outer Space Treaty potentially affecting asteroid mining. First, the change of language from “province of all mankind” in the Outer Space Treaty,⁴⁶ to “common heritage of mankind” in the Moon Treaty,⁴⁷ has been interpreted by some to imply a different legal treatment of property rights.⁴⁸ Records from the negotiations regarding the Outer Space Treaty indicate that the phrase “province of all mankind” was understood to mean that space and celestial bodies were to be available for the free use of all mankind, not jointly owned by mankind and requiring an international governing body for distribution.⁴⁹ In contrast, the doctrine of “common heritage” has been interpreted to mean the converse.⁵⁰ Therefore, although the Moon Treaty has no power over the United States, it does demonstrate that the Outer Space Treaty does not prohibit private ownership.⁵¹

Although the Outer Space Treaty may not prevent private citizens or companies from claiming resources mined from asteroids as property, no nation has yet recognized private claims to celestial property. This does not seem, however, to have deterred some potential sellers of celestial property and many potential buyers.

In 1980, Dennis Hope, a then-broke United States citizen, researched the Outer Space Treaty at a local public library.⁵² Hope was struck by the realization that the treaty seemed only to ban appropriation of celestial property by nations.⁵³ He then filed a claim for the moon as well as the other eight planets and all of their moons with the United Nations, along with a note detailing his intent to subdivide and sell this property.⁵⁴ Perhaps unsurprisingly, Hope never received a reply from the United Nations, and no government has considered it necessary to challenge his claim.⁵⁵ Since

45. Feinman, *supra* note 2, at 217.

46. Outer Space Treaty, *supra* note 26, at art. I.

47. Moon Treaty, *supra* note 38, at art. 11(1)

48. Feinman, *supra* note 2, at 218.

49. Kelly M. Zullo, *The Need to Clarify the Status of Property Rights in International Space Law*, 90 GEO. L.J. 2413, 2419 (2002) (quoting U.S.S.R. Working Paper, Annex I, at 24–25, UN Doc. A/AC.105/115 (Mar. 28, 1973) (explaining the phrase “province of all mankind” to mean available for the “undivided and common use of all states on [E]arth.”)).

50. Feinman, *supra* note 2, at 218; *see also* Johnson, *supra* note 25, at 1496 (explaining the doctrine of “common heritage” as embodied by the Moon Treaty).

51. Tingkang, *supra* note 3, at 572–73.

52. Rachel Hardwick, *Dennis M. Hope Has Owned the Moon Since 1980 Because He Says So*, VICE (Apr. 11, 2013), <http://www.vice.com/read/ive-owned-the-moon-since-1980>.

53. *Id.*

54. *Id.*

55. *Id.*

launching his celestial real estate business, Hope's Moon Estates⁵⁶ has sold over one billion acres of land on the solar system's moons and other planets.⁵⁷ In 2007, a Chinese court fined a Beijing company for selling lunar real estate in a plan reminiscent of Hope's.⁵⁸

Only one claim to property on a celestial object has reached United States federal courts.⁵⁹ On February 17, 1996, NASA launched the Shoemaker probe as part of the Near Earth Asteroid Rendezvous project; the probe landed on Asteroid 433, "Eros," on February 12, 2001, as planned.⁶⁰ The plaintiff, Gregory Nemitz, contacted NASA to demand storage or parking fees for the probe, claiming a property and security interest in Eros, having registered his claim to the asteroid with the Archimedes Institute prior to the probe's landing.⁶¹ The Archimedes Institute's website, where Nemitz had registered his claim, displayed a disclaimer that it lacked the authority to confer property rights, and existed only to serve as a registry of claims.⁶² In April of 2001, General Counsel to NASA contacted Nemitz through a letter, explaining that it was NASA's opinion that Nemitz had failed to demonstrate a valid property interest in the asteroid.⁶³ In 2003, Nemitz received a letter from the State Department, expressing the department's opinion that Nemitz's claim was precluded by the Outer Space Treaty.⁶⁴ Nemitz filed suit in federal district court in November of that year claiming violations of the Fifth, Ninth, and Tenth Amendments, a breach of implied contract, and a violation of Public Law 85-568 § 102, which is now 51 U.S.C.A. § 20102(c) (the congressional mandate to NASA to promote commercial utilization of space, discussed in Section I of this Note).⁶⁵

Fortunately for asteroid mining companies, the court chose not to follow the reasoning of the State Department, although it did dismiss

56. To find out more information about Hope's company or to "purchase" your own piece of the solar system, visit <http://www.moonestates.com>.

57. Hardwick, *supra* note 52.

58. *China Bans Firm from Selling Land on the Moon*, MOON DAILY (Mar. 17, 2007), http://www.moondaily.com/reports/China_Bans_Firm_From_Selling_Land_On_The_Moon_999.html.

59. *Nemitz v. United States*, No. CV-N030599-HDM (RAM), 2004 WL 3167042 (D. Nev. Apr. 26, 2004).

60. *Id.* at *1.

61. *Id.*

62. *Id.*

63. Letter from Edward A. Frankle, General Counsel, National Aeronautics and Space Administration to Gregory Nemitz (Apr. 9, 2001), www.orbdev.com/010409.html [hereinafter Frankle Letter].

64. Letter from Ralph L. Braibanti, Director, Space and Advanced Technology, United States Department of State, Bureau of Oceans and International Environmental and Scientific Affairs to Gregory William Nemitz (Aug. 15, 2003), <http://www.erosproject.com/exhibit01.html> [hereinafter Braibanti Letter].

65. *Nemitz*, 2004 WL 3167042 at *1.

Nemitz's case.⁶⁶ In a short opinion, the court reasoned that a Fifth Amendment takings claim required a constitutionally protected property interest, and such property interest had neither been created by Nemitz's registration with the Archimedes Institute nor by 51 U.S.C.A. § 20102(c).⁶⁷ Furthermore, "[n]either the Ninth nor the Tenth Amendments provides a cognizable cause of action for the denial of a property interest in outer space."⁶⁸ Finally, the court opined that neither the United States' ratification of the Outer Space Treaty nor its abstinence from the Moon Treaty created the right of a United States citizen to appropriate property in space.⁶⁹ The Court of Appeals for the Ninth Circuit affirmed the holding without issuing a full opinion.⁷⁰

At first blush, it may seem as though *Nemitz* closes the door to private citizens or companies hoping to acquire property in space. However, the district court did not hold that property rights in space do not exist or that private entities could not obtain celestial property rights; rather, the court held that none of the sources cited by Mr. Nemitz *created* property rights in Eros.⁷¹ Furthermore, in response to the defendants' motion to dismiss for failure to state a claim, Nemitz argued that he did "not seek a declaration from this Court that he ha[d] an ownership interest in [Eros]."⁷² This statement, and its inclusion in the opinion, could be seen as rendering the court's reasoning unnecessary dicta since the statement negates Nemitz's original complaint seeking declaratory judgment.⁷³ Far from a judicial decision declaring ownership of asteroids illegal, the *Nemitz* case suggests that the door to celestial property rights is wide open; all that is needed is for Congress to provide a statutory path through the doorway. And if Congress does not, there is little preventing China or Russia from beating the United States to the mineral motherload.

III. SAILING THROUGH THE HEAVENS: POTENTIAL STATUTORY SCHEMES

The expanse of space is considered an area *res communis*—a common area under no nation's sovereignty.⁷⁴ Therefore, it has an important and

66. *Id.* at *1–2.

67. *Id.* at *1.

68. *Id.*

69. *Id.* at *2.

70. *Nemitz v. NASA*, 126 F. App'x. 343 (9th Cir. 2005).

71. Austin C. Murnane, *The Prospector's Guide to the Galaxy*, 37 *FORDHAM INT'L L.J.* 235, 266 (2013).

72. *Nemitz*, 2004 WL 3167042 at *1.

73. Murnane, *supra* note 71, at 265–66.

74. Brian Beck, *The Next, Small, Step for Mankind: Fixing the Inadequacies of the International Space Law Treaty Regime to Accommodate the Modern Space Flight Industry*, 19 *ALB. L.J. SCI. & TECH.* 1, 9 (2009).

often cited analogue on planet Earth, the high seas.⁷⁵ Like the high seas, outer space has the potential to be used for recreation, travel, warfare, science, and resource extraction. Both areas of *res communis* have witnessed technological competitions and races for superiority. Just as nations enjoy some control over waters adjacent to their coastlines, so, too, do nations enjoy sovereignty over the airspace directly over their territory.

The analogy so appeals to our common senses that the English term “ship” refers to both seafaring and spacefaring vessels. For centuries, the possibility that the deep seabed could be mined for valuable and vital minerals remained technologically unfeasible and relatively unconsidered.⁷⁶ When mankind became capable of reaching, exploring, and exploiting the deep seabed, it “became the subject of competing interpretations of property rights in international law.”⁷⁷ And as discussed above, at approximately the same time, outer space became a topic of debate regarding the exploitation of its mineral resources. Because mankind has been negotiating the waters of the world for far longer than the cosmos, it makes sense to look to maritime law as a guide for solving problems of *res communis*.

Since the Cold War, international space and maritime treaty regimes have mirrored and paralleled each other. In 1958, the United Nations promulgated the Convention on the High Seas, which was ratified by the United States in 1962.⁷⁸ The 1958 Convention afforded the world’s oceans treatment strikingly similar to that afforded to space by the Outer Space Treaty. Article 2 of the 1958 Convention stated that “no State may validly purport to subject any part of [the high seas] to its sovereignty.”⁷⁹ Like the Outer Space Treaty, Article 4 of the 1958 Convention provided that every state should have the right to travel on the high seas, even those without coastlines.⁸⁰ And just as the Outer Space Treaty sought to ban certain activities and cargos from space and provided for liability, the 1958 Convention prohibited the carrying of slaves and piracy and set up a liability regime.⁸¹ Both the Outer Space Treaty and the 1958 Convention treat their respective area of influence as *res communis*, open to the use of all but free from national sovereignty.⁸² This assertion is evidenced by the two documents’ parallel treatments of the pursuits of fishing and the use of geosynchronous orbits, both of which involve some aspects of property

75. Murnane, *supra* note 71, at 249.

76. *Id.*

77. *Id.* at 250.

78. Apr. 29, 1958, 13 U.S.T. 2312, 450 U.N.T.S. 82 [hereinafter 1958 Convention].

79. *Id.* at art. 2.

80. *Id.* at art. 4.

81. *Id.* at art. 13–20.

82. Johnson, *supra* note 25, at 1511–12.

rights and limited resources. As private fishermen may use the high seas to profit through fishing without infringing on the rights of others, so may private companies use geosynchronous orbits to profit through the satellite industry.⁸³ In other words, both the sea and geosynchronous orbit slots represent the media through which the actor travels in order to achieve profits through additional and separate efforts.

In 1982, the United Nations promulgated the United Nations Convention on the Law of the Sea.⁸⁴ The Preamble to UNCLOS reads in part, “The area of the seabed and ocean floor and the subsoil thereof, beyond the limits of national jurisdiction, as well as its resources, are the common heritage of mankind, the exploration and exploitation of which shall be carried out for the benefit of mankind as a whole”⁸⁵ Sound familiar? UNCLOS incorporates this language from an earlier document—the Declaration of Principles Governing the Sea-Bed and Ocean Floor—under development during the same period as the Moon Treaty.⁸⁶ As might be expected, UNCLOS, its subsequent additions, and the Moon Treaty anticipate similar international mechanisms for distributing resources taken from the Moon/seabed for the benefit of all nations.⁸⁷ And like the Moon Treaty, UNCLOS has been widely rejected by nations that possess the technological capability to actually mine the resources in question, including the United States.⁸⁸

Because seabed mining is not only possible but also currently practiced, UNCLOS provides a more developed example of the type of international regime that might be expected from the Moon Treaty. UNCLOS has already created and mobilized the International Seabed Authority, which is tasked with collecting the technology and some of the proceeds produced by commercial seabed mining, and distributing them to less developed nations.⁸⁹ In addition, UNCLOS attempts to limit seabed mining operations to organizations from party nations and a United Nations-run enterprise called “the Enterprise,” which does not yet exist.⁹⁰

Proponents of UNCLOS argue that the UNCLOS regime is necessary to prevent environmental destruction and promote research, technological development, and commercial mining operations; however, the modern reality proves the falsity of this belief.⁹¹ Additional evidence can be

83. *Id.* at 1512.

84. Dec. 10, 1982, 1833 U.N.T.S. 71 [hereinafter UNCLOS].

85. *Id.* at Preamble.

86. Murnane, *supra* note 71, at 250.

87. *Id.* at 251.

88. *Id.* at 252.

89. *Id.* at 251.

90. *Id.* at 252.

91. *Id.* at 253.

gleaned from the UN's reluctant publication of the *Law of the Sea Bulletin*, which records the mining claims of companies from non-party states, including the United States.⁹²

In recognition of the benefits of and need for seabed mining despite the lack of a satisfactory international regulatory system, Congress passed the Deep Seabed Hard Mineral Resources Act in 1980.⁹³ The Findings and Purposes Section of the Act reflect three overarching facts about the situation leading to its enactment: the intense need for and impending shortage of minerals that can be found in the deep seabed, the lack of a suitable international regulatory scheme to govern deep seabed mining, and the pragmatic goals of protecting both the environment and investor expectations in property rights.⁹⁴ Importantly, the Findings and Purposes section also seeks to maintain relations with the international community by including the goals of encouraging the development of a suitable international regulatory regime and the commitment to submit to such a regime when it is created.

Much scholarship has been devoted to solutions to the lack of international and domestic asteroid mining regulations, from proposals for new regulatory schemes,⁹⁵ to recycling the Mining Law of 1872.⁹⁶ However, the best way forward for the United States was posited at least as early as the *Nemitz* affair. As mentioned before, Edward Frankle, NASA's General Counsel, composed a letter to Nemitz in 2001.⁹⁷ After explaining why he believed Nemitz's claim lacked legal backing, Frankle compared legally cognizable property rights under the Deep Seabed Hard Mineral Resources Act to Nemitz's situation.⁹⁸ The letter stated that Nemitz's claim was "unlike an individual's claim to seabed minerals, which was considered and debated by the U.S. Congress that subsequently enacted a statute, The Deep Seabed Hard Minerals Resources Act . . . expressly authorizing such claims. There is no similar statute related to resources in outer space."⁹⁹ That is, Nemitz's claim did not fail because private parties could not obtain property rights over asteroids, it failed because Congress had not yet provided a way for private parties to obtain those rights.¹⁰⁰ Why create a new statutory scheme when one already exists that effectively governs an area of law extremely analogous to space law?

92. *Id.* at 254.

93. 30 U.S.C. § 1401 (2012).

94. *Id.*

95. See Beck, *supra* note 74; Feinman, *supra* note 2.

96. See Shaw, *supra* note 1.

97. Frankle Letter, *supra* note 63.

98. *Id.*

99. *Id.*

100. Murnane, *supra* note 71, at 265–66.

The Deep Seabed Hard Minerals Resources Act is a comprehensive piece of legislation that would require very little change in order to function in the context of asteroid mining. Sections 1412–17 detail a licensing scheme that would meet the requirements of the Outer Space Treaty as well as the Registration Convention.¹⁰¹ The treaty contains a provision to ensure that deep seabed mining activities do not interfere with the free use of the sea, as guaranteed by the 1958 Convention.¹⁰² Subchapter II provides for the transition process to an international regime when such a treaty is enacted.¹⁰³ Subchapter III provides strong enforcement mechanisms both criminal and civil.¹⁰⁴

Most importantly, § 1427 creates a civil cause of action for the enforcement of property rights created by the act.¹⁰⁵ To avoid disputes over forum, the act provides that claims must be brought in the United States District Court for the District of Columbia, which prevents some potential forum disputes and ensures that the potentially international face of U.S. space law remains undivided by circuit splits.¹⁰⁶ Insightfully, Congress even provided for the protection of foreign investors in U.S. companies and for the protection of U.S. property interests against foreign claims by granting the D.C. District Court jurisdiction in both circumstances.¹⁰⁷

One of the strongest arguments against the Deep Seabed Hard Minerals Resources Act is that uniform international submission to a single regulatory authority best ensures the environmental protection of deep seabed ecosystems and species. While a contentious point in regards to UNCLOS, a U.S. asteroid mining legal system modeled on the Deep Seabed Hard Minerals Resources Act would be less susceptible to such criticism. Although some may see every celestial body as a unique environment worthy of protection, asteroids present a very real threat to every life, human or other, on the planet. There are currently 1,258 catalogued and tracked Potentially Hazardous Asteroids in the solar system.¹⁰⁸ Even the asteroids that are currently untracked because of their smaller size “generate explosions several times larger than that of the Hiroshima atom bomb” if they penetrate the atmosphere.¹⁰⁹ But incentivizing asteroid mining will inevitably lead to the development of

101. 30 U.S.C. §§ 1412–17 (2012).

102. *Id.* at § 1421.

103. *Id.* at §§ 1441–44.

104. *Id.* at §§ 1461–73.

105. *Id.* at § 1427.

106. *Id.*

107. *Id.*

108. Tingkang, *supra* note 3, at 567.

109. David Morrison, *Impacts and Evolution: Protecting Earth from Asteroids*, 154 PROC. AM. PHIL. SOC'Y 439, 441 (2010).

technologies to intercept asteroids, technology that could be easily adapted to prevent an Armageddon-inducing asteroid from impacting the surface of the earth. At the current rate of technological innovation, NASA estimates that humanity will have the capability to seize and control a 500,000-kilogram asteroid by 2025.¹¹⁰ That means that incentivizing asteroid mining could literally produce the technology that may save mankind.¹¹¹

CONCLUSION

In 2012, Donna Beck filed a complaint in Texas District Court alleging fraud regarding asteroid mining.¹¹² The complaint alleged that an attorney by the name of Arthur Dula persuaded Beck and her husband to invest \$300,000 in a company that fraudulently claimed to have the ability to launch the first commercial asteroid mining mission.¹¹³ The complaint claimed that the advanced money was then used for travel expenses to attend international space conferences.¹¹⁴ Although this episode of fraud makes for an interesting anecdote, at a deeper level it shows the size of the need for U.S. asteroid mining laws. At least some financially empowered portion of the public now realizes that commercial asteroid mining is within the reach of human technology and potentially profitable. The legal community now recognizes the public interest in the space mining, and is ready to apply efforts in its direction.

Although the international space treaty regime does not provide satisfactory protection of celestial property rights or incentives for commercial space industries, technological advancement need not sit still or move at the snail's pace allowed by modern federal policy. Congress has demonstrated some interest in the idea of the commercialization of space. More importantly, Congress has demonstrated an ability to draft effective legislation in the face of unsatisfactory international regulatory regimes regarding mineral extraction through the deep sea mining regime, legislation that is both comprehensive and readily adaptable to the needs of celestial mining. Because the United States, its citizens, and the people of the world stand to benefit from asteroid mining, Congress should fast track asteroid mining regulation based upon the Deep Seabed Hard Minerals Resources Act. Otherwise, the country will suffer from both the lack of technological innovation that will stem from asteroid mining, and from the

110. Murmane, *supra* note 71, at 239–40.

111. *Id.* at 240.

112. *Space Odyssey? Lawyer's Asteroid Plan a Sham, Suit Says*, 22 No. 5 WESTLAW J. PROF. LIABILITY 4 (Oct. 23, 2012).

113. *Id.*

114. *Id.*

introduction into global markets of trillions of dollars worth of rare minerals by foreign companies.

“This is space! ‘course, we’re just in the beginning part of space, we-we haven’t even got to *outer* space yet!”¹¹⁵

*Lucian Y. Grove III**

115. ARMAGEDDON (Touchstone Pictures 1998).

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