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The Prospector's Guide to the Galaxy

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NOTE

THE PROSPECTOR'S GUIDE TO THE GALAXY*

Austin C. Murnane^a

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* With apologies to Douglas Adams. See generally DOUGLAS ADAMS, THE HITCHHIKER'S GUIDE TO THE GALAXY 4 (1979) ("In many of the more relaxed civilizations on the Outer Eastern Rim of the Galaxy, the *Hitchhiker's Guide* has already supplanted the great *Encyclopedia Galactica* as the standard repository of all knowledge and wisdom, for though it has many omissions and contains much that is apocryphal, or at least wildly inaccurate, it scores over the older, more pedestrian work in two important respects. Firstly, it is slightly cheaper; and second, it has the words DON'T PANIC inscribed in large friendly letters on its cover.").

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INTRODUCTION

Congratulations on your decision to acquire an asteroid! As you probably know, asteroids are rocky celestial bodies that travel the solar system in elliptical orbits around the Sun.¹ Some asteroids are very small rocks, while others are huge bodies almost one thousand kilometers in diameter.² Most asteroids remain in the Main Asteroid Belt between the orbits of Jupiter and Mars, while others wander the solar system in their own unique orbits.³

This Note will analyze your legal right to acquire an asteroid and its resources. As we will explain, that right depends

1. By “celestial body,” this Note refers to objects originating in space, in accordance with the ancient distinction between such objects and those originating on Earth. *See, e.g.*, 1 *Corinthians* 15:40 (“There are also heavenly bodies and there are earthly bodies; but the splendor of the heavenly bodies is one kind, and the splendor of the earthly bodies is another.”). However, “celestial body” lacks a firm definition in law. *See e.g.*, FRANCIS LYALL & PAUL B. LARSEN, *SPACE LAW: A TREATISE* 175 n.2 (2009) (describing the absence of a definition of “celestial body” in several treaties that use the term); *see also Asteroids: Read More*, NASA, <http://solarsystem.nasa.gov/planets/profile.cfm?Object=Asteroids&Display=OverviewLong> [hereinafter NASA, *Asteroids*] (last visited Oct. 8, 2013) (describing asteroid orbits around the Sun); *Near Earth Asteroids*, INT’L ASTRONOMICAL UNION (Mar. 19, 2013), <http://www.iau.org/public/nea/> [hereinafter IAU] (describing asteroids as celestial bodies).

2. *See* NASA, *Asteroids*, *supra* note 1 (describing asteroids as ranging in size from 952 kilometers to less than 1 kilometer in diameter); *see also* IAU, *supra* note 1 (estimating that 15,000 Near Earth Asteroids (“NEAs”) have a diameter of less than 140 meters). This Note expresses all measurements in metric units out of respect to the employees of National Aeronautic and Space Administration (“NASA”) who lost their Mars Climate Orbiter in 1999 because a contractor calibrated the measurements for a key spacecraft operation in feet instead of meters. *See* Robin Lloyd, *Metric Mishap Caused Loss of NASA Orbiter*, CNN (Sep. 30, 1999), <http://www.cnn.com/TECH/space/9909/30/mars.metric.02/>; *Mars Mission’s Metric Mixup*, WIRED (Sept. 30, 1999), <http://www.wired.com/science/discoveries/news/1999/09/31631> (describing the loss of the Mars Climate Orbiter due to confusion of imperial and metric units).

3. *See* CAROLYN CROW, *THE MAIN ASTEROID BELT* 1 (2009) (explaining that the Main Asteroid Belt lies between the Mars and Jupiter orbits); *see also* NASA, *Asteroids*, *supra* note 1 (explaining that most asteroids orbit the Sun between Jupiter and Mars).

on whether anyone can own or use celestial resources. International law might recognize the claim of whichever person, natural or corporate, first acquires resources in space. Alternatively, the law might recognize some Earth-based authority's sovereignty over celestial bodies, and allow that authority to govern the resources of the universe.

The right to acquire property in space is not a strictly academic concept. In fact, it has staggering economic potential.⁴ There are more than 500,000 known asteroids in Earth's solar system, and many more await discovery.⁵ Some asteroids contain precious metals such as gold, platinum, and palladium—so much of these, in fact, that an asteroid mining venture could turn a profit by doing nothing more than delivering precious metals to Earth.⁶ Of course, asteroid prospectors might also diversify their businesses by distributing other asteroid resources.⁷ These include construction staples like iron and nickel, semiconductor components like silicon and aluminum, and fertilizer ingredients like nitrogen and ammonia.⁸ The most

4. See SHANE D. ROSS, NEAR-EARTH ASTEROID MINING 4 (2001), available at <http://www2.esm.vt.edu/~sdross/papers/ross-asteroid-mining-2001.pdf> (describing how chemical analysis of meteorites and spectral analysis of asteroid-reflected light indicate the presence of gold, platinum, and palladium and other metals); see also NASA, *Asteroids*, *supra* note 1 (asserting that there are more than 500,000 known asteroids in the solar system, and probably many more still yet to be discovered).

5. See NASA, *Asteroids*, *supra* note 1; IAU MINOR PLANET CENTER, <http://www.minorplanetcenter.net/> (last visited Mar. 29, 2013) (describing how the International Astronomical Union's ("IAU") Minor Planet Center at the Smithsonian Astrophysical Observatory has identified the orbits of more than 600,000 celestial bodies, otherwise known as "minor planets").

6. See JOHN BROPHY ET AL., KECK INST. SPACE STUDIES, ASTEROID RETRIEVAL FEASIBILITY STUDY 12 (2012) (asserting that an asteroid mission could expect to retrieve platinum group metals through chemical or physical processing); see also Kenneth Chang, *In Pursuit of Riches, and Travelers' Supplies, in the Asteroid Belt*, N.Y. TIMES, Apr. 24, 2012, at D3 (asserting that a single spacecraft need not recover a large amount of platinum to turn a profit); ROSS, *supra* note 4, at 4 (explaining that chemical analysis of meteorites and spectral analysis of asteroid-reflected light indicate the presence of gold, platinum, and palladium and other metals).

7. See Michael Belfiore, *How to Mine an Asteroid*, 189 POPULAR MECHS. 8, 53–55 (2012) (describing various uses of asteroid resources other than precious metals); Chang, *supra* note 6, at D3 (describing various uses of non-precious-metal resources); ROSS, *supra* note 4, at 6 (asserting that asteroid miners could also provide semiconductor materials for the photovoltaic solar panel industry).

8. See Brian O'Leary, *Mining the Apollo and Amor Asteroids*, 197 SCI. 363, 363–64 (1977) (explaining that optical studies suggest some asteroids contain large quantities of iron and nickel, and chemical analysis of meteorites and lunar samples indicates the

useful asteroid resource may be the least conspicuous: ice, which could supply water for spacecraft life support.⁹ Hydrolysis could convert asteroid water into hydrogen and oxygen, which are valuable as fuel and breathable air.¹⁰ Asteroids may also provide other materials to shield spacecraft from cosmic radiation, which currently makes deep space exploration too dangerous for humans.¹¹

Most asteroids orbit far from Earth—much farther than Earth’s Moon and other planets like Mars.¹² Nevertheless, the physical characteristics of space travel make some asteroids less costly to reach.¹³ Large celestial bodies like the Moon and Mars

presence of silicates, aluminum, nitrogen); Belfiore, *supra* note 7, at 55 (asserting that asteroid nitrogen and ammonia could provide valuable fertilizer); ROSS, *supra* note 4, at 1–4 (explaining that chemical and spectral analysis indicate the presence of iron, nickel, silicon, aluminum, nitrogen, and ammonia).

9. See Belfiore, *supra* note 7, at 53 (explaining that carbonaceous chondrite asteroids are a good source of water, which could be cheaper to harvest in space than to launch from Earth); O’Leary, *supra* note 8, at 364 (explaining that chemical analysis of carbonaceous chondrite meteors indicates the presence of water); ROSS, *supra* note 4, at 4, 8 (explaining that about half of NEAs (by mass) are water-rich carbonaceous asteroids, which could provide water for life support).

10. See Belfiore, *supra* note 7, at 53 (describing how hydrogen and oxygen could provide fuel); see also ROSS, *supra* note 4, at 4 (explaining that hydrogen and oxygen from asteroids could provide propellant and life support).

11. See Rachel Kaufman, *Astronauts Could Ride Asteroids to Mars, Study Says*, NAT’L GEOGRAPHIC (Feb. 10, 2011), <http://news.nationalgeographic.com/news/2011/02/110210-mars-trip-asteroids-taxi-cosmic-rays-hitchhikers-space-science/> (describing physicist Gregory Matloff’s study published in *Acta Astronautica*, which argued that asteroids themselves can serve as vehicles to protect humans from galactic cosmic rays while transporting them through deep space); BROPHY ET AL., *supra* note 6, at 7 (explaining that asteroid materials could provide necessary shielding to protect humans from dangerous cosmic rays in deep space).

12. See CROW, *supra* note 3, at 1 (explaining that the Main Asteroid belt, with its innermost limit at 2.12 Astronomical Units (“AU”) from the sun, is more than twice as far from the sun as Earth, which orbits at an average of 1 AU); see also *Earth’s Moon: Facts & Figures*, NASA, <http://solarsystem.nasa.gov/planets/profile.cfm?Display=Facts&Object=Moon> (last visited Dec. 11, 2012) [hereinafter NASA, *Earth’s Moon*] (explaining that the Moon’s average distance from Earth is 384,400 kilometers); *Mars Fact Sheet*, NASA, <http://nssdc.gsfc.nasa.gov/planetary/factsheet/marsfact.html> (last visited Dec. 11, 2012) [hereinafter NASA, *Mars Fact Sheet*] (explaining that Mars’ minimum distance from earth is 55.7 million kilometers).

13. See MICHAEL A. SEEDS & DANA E. BACKMAN, *THE SOLAR SYSTEM* 83 (2010) (explaining that escape velocity depends upon the mass and radius of the celestial body from which an object seeks to escape); see also *Ceres: Facts & Figures*, NASA, http://solarsystem.nasa.gov/planets/profile.cfm?Object=Dwa_Ceres&Display=Facts&System=Metric (last visited Oct. 8, 2013) [hereinafter NASA, *Ceres*] (explaining

exert strong gravity, which would require a spacecraft on the surface to generate more thrust to reach “escape velocity” during liftoff.¹⁴ Asteroids, on the other hand, are smaller, have weaker gravity, and thus require much less energy to escape.¹⁵ In fact, a spacecraft’s encounter with most asteroids would be more like the docking and departure of a seagoing ship than the landing and takeoff of an aircraft.¹⁶ Asteroids are therefore cost-effective destinations for round-trip missions.¹⁷

One space probe from Earth has already landed on an asteroid, recovered a small sample of its surface material, and returned it to Earth.¹⁸ The probe was called Hayabusa, and the Japanese Aerospace Exploration Agency used it to collect small particles on an asteroid named 25413 Itokawa in 2005.¹⁹ After Hayabusa gathered its samples, it separated from the asteroid, propelled itself back to Earth, and landed in Southern Australia in 2010.²⁰ Previously, in 2001, a National Aeronautics and Space Administration (“NASA”) probe traveled to asteroid 433 Eros, where it conducted analysis of the asteroid and transmitted its findings to Earth.²¹ NASA believes that by 2025 it will be possible

that Ceres, the largest known asteroid, has an escape velocity of less than 0.64 kilometers, per second (“km/s”).

14. NASA, *Earth’s Moon*, *supra* note 12; NASA, *Mars Fact Sheet*, *supra* note 12; SEEDS & BACKMAN, *supra* note 13, at 141, 157 (explaining that the Moon’s escape velocity is 2.438 km/s and Mars’s escape velocity is 5.03 km/s).

15. See NASA, *Ceres*, *supra* note 13 (explaining that Ceres has an escape velocity of less than 0.64 km/s); see also SEEDS & BACKMAN, *supra* note 13, at 559 (comparing Ceres’s size to Earth’s Moon).

16. See Belfiore, *supra* note 7, at 52 (asserting that Spacecraft would dock with, not land upon, a small asteroid without appreciable gravity); BROPHY ET AL., *supra* note 6, at 36 (discussing possible methods of anchoring to an asteroid to maintain contact with it).

17. See *Asteroids*, PLANETARY RESOURCES, <http://www.planetaryresources.com/asteroids/> (last visited Feb. 9, 2013) (explaining that Asteroids’ low gravity makes departure easier).

18. Ker Than, *Hayabusa Spacecraft Returns with Fiery Show*, NAT’L GEOGRAPHIC (June 14, 2010), <http://news.nationalgeographic.com/news/2010/06/100614-science-space-asteroids-hayabusa-return-fiery/> (describing how the Hayabusa capsule returned from an asteroid and landed in Australia on June 13, 2010); Hisayoshi Yurimoto et al., *Oxygen Isotopic Compositions of Asteroidal Materials Returned from Itokawa by the Hayabusa Mission*, 333 SCIENCE 1116, 1116 (2011) (describing study of materials that Hayabusa retrieved from asteroid 25143 Itokawa in June 2010).

19. Yurimoto et. al., *supra* note 18, at 1116.

20. See *id.*

21. See *NEAR Shoemaker*, NASA, <http://science.nasa.gov/missions/near/> (last visited Oct. 10, 2013) (describing how the Near Earth Asteroid Rendezvous (“NEAR”)

to seize control of a 500,000 kilogram asteroid and tow the entire body back to Earth.²²

Besides the financial incentives for operators and investors, asteroid exploration could promote advances in science and engineering for all mankind.²³ Asteroid research could help astronomers better understand the history of the solar system and the origins of life.²⁴ Prospectors' efforts to reach and exploit asteroids could also facilitate engineering progress.²⁵ SpaceDev Corporation, which unsuccessfully attempted to build asteroid mining craft in the early 2000s, managed to develop the rocket motors that now power the private space vessel SpaceShipOne.²⁶ Autonomous missions to asteroids would require advances in navigation and electrolysis technology that could facilitate future manned missions in deep space.²⁷ The technology that

Shoemaker probe achieved a soft landing on asteroid 433 Eros); *see also* Press Release, Johns Hopkins Univ. Applied Physics Lab., NEAR Shoemaker's Historic Landing on Eros Exceeds Science, Engineering Expectations (Feb. 14, 2001), <http://www.jhuapl.edu/newscenter/pressreleases/2001/010214.asp>.

22. *See* Jeff Hecht, *NASA Mulls Plan to Drag Asteroid into Moon's Orbit*, *NEW SCIENTIST* (Jan. 2, 2013, 3:15 PM), <http://www.newscientist.com/article/dn23039-nasa-mulls-plan-to-drag-asteroid-into-moons-orbit.html> (reporting that the National Aeronautic and Space Association ("NASA") is considering a US\$2.6 billion mission to capture an asteroid and drag it into the Moon's orbit); *see also* BROPHY ET AL., *supra* note 6, at 5 (describing how a study indicates it would be feasible to return a 500,000 kilogram asteroid to an orbit in vicinity of the Moon by 2025).

23. *See* BROPHY ET AL., *supra* note 6, at 11–12 (describing anticipated progress in space science and engineering related to asteroid missions).

24. *See* Irene Klotz, *Asteroid Mission to Look for Seeds of Life*, *DISCOVERY NEWS* (Sept. 27, 2012), <http://news.discovery.com/earth/asteroid-sample-mission-120927.html> (describing how Japanese scientists intend to study asteroid material to learn about the history of the early Solar System); *Dawn at a Glance*, NASA, http://www.nasa.gov/mission_pages/dawn/mission/index.html (last visited Nov. 8, 2013) (describing how NASA intends to study two asteroids in order to learn about the history of the early solar system and the evolution of celestial bodies).

25. *See* Chang, *supra* note 6, at D3 (reporting that SpaceDev failed to launch an asteroid expedition but succeeded in developing rockets for Virgin Galactic and SpaceShipOne); ROSS, *supra* note 4, at 6 (describing SpaceDev's asteroid prospecting plans as of 2001); *Propulsion Systems*, SIERRA NEVADA CORP., http://www.spacedev.com/ss_propulsion.php (last visited Mar. 29, 2013) (describing how Sierra Nevada Corporation's hybrid rocket motors powered SpaceShipOne); Press Release, Sierra Nevada Corp., Virgin Galactic Joins in Sierra Nevada Space Systems' Dream Chaser Orbital Space Vehicle Program (Dec. 15, 2010), http://www.sncorp.com/press_more_info.php?id=433 (reporting that Virgin Galactic will support global sales and marketing of the Sierra Nevada Corporation's Dream Chaser Orbital Space Vehicle).

26. *See* Chang, *supra* note 6, at D3.

27. *See* Press Release, Dwayne C. Brown, NASA, NASA to Launch New Science Mission to Asteroid in 2016 (May 25, 2011), <http://www.nasa.gov/home/hqnews/>

prospectors use to control asteroids might later help deflect dangerous asteroids from heading toward Earth, which means prospecting technology could literally save this planet.²⁸ At the very least, prospectors' telescopes would increase humanity's chance of detecting an incoming asteroid.²⁹ As the surprise explosion over Russia on January 15, 2013 made clear, the danger of undetected asteroids remains significant.³⁰

Commercial space activity is no longer a matter of science fiction. The space industry already includes fully operational companies like SpaceX, which brings customers' payloads up to Earth orbit, and as-yet-unrealized ventures like Moon Express, which plans to mine resources on the Moon.³¹ Mars One, a non-profit organization working to establish a colony on Mars, is one of many enterprises attempting to follow their lead.³² If you plan

2011/may/HQ_11-163_New_Frontier.txt (asserting that a robotic mission to an asteroid will "pave the way" for future human missions in deep space); *Asteroid Usage*, PLANETARY RESOURCES, <http://www.planetaryresources.com/asteroids/usage/> (last visited Jan. 9, 2013) (asserting that various uses of space water can accelerate the progress of human spaceflight); BROPHY ET AL., *supra* note 6, at 12 (describing hypothetical use of electrolysis in space).

28. See Paul Marks, *Asteroid Miners Want to Turn Rocks into Spacecrafts*, NEW SCIENTIST (London), Aug. 2012, at 28, 30 (reporting Planetary Resources co-chairman Eric Anderson's assertion that learning how to control asteroids is necessary for the future safety of the Earth); BROPHY ET AL., *supra* note 6, at 11–12 (asserting that processes developed to control and maneuver asteroids would directly contribute to planetary defense).

29. Press Release, Peter H. Diamandis & Eric C. Anderson, Planetary Resources, Future Asteroid Mining Industry Will Provide Capability to Aid the Deflection of Potentially Hazardous Objects Near Earth (Feb. 14, 2013), <http://www.planetaryresources.com/2013/02/future-asteroid-mining-industry-will-provide-capability-to-aid-the-deflection-of-potentially-hazardous-objects-near-earth/> (asserting that asteroid mining technology could help detect potentially dangerous asteroids).

30. See Andrey Kuzmin, *Meteorite Explodes over Russia, More than 1,000 Injured*, REUTERS (Feb. 15, 2013), <http://www.reuters.com/article/2013/02/15/us-russia-meteorite-idUSBRE91E05Z20130215>; see also Monte Morin, *Russian Meteor Not Related to 2012 DA14, Scientists Say*, L.A. TIMES, Feb. 15, 2013, at 3 (reporting that while astronomers were tracking the close approach of one asteroid to Earth, another asteroid approached from another direction and remained unnoticed until it exploded over Russia).

31. See *Missions*, MOON EXPRESS, <http://www.moonexpress.com/missions.html> (last visited Jan. 9, 2013) (describing Moon Express's intention to use of Moon resources commercially); *Company Overview*, SPACE X, <http://www.spacex.com/company.php> (last visited Mar. 29, 2013) (describing how SpaceX provides space launch services).

32. See Christina Chaey, *Mars One Has Officially Raised "Millions" To Build the Red Planet's First Human Colony*, FAST CO. (Jan. 30, 2013), <http://www.fastcompany.com/3005255/fast-feed/mars-one-has-officially-raised-millions-build-red-planets-first-human->

to acquire resources beyond Earth's atmosphere, your most significant competitor is probably Planetary Resources, an American asteroid mining company based in the State of Washington.³³ Planetary Resources intends to deliver asteroid products to customers on Earth and in space.³⁴ The company is currently building satellite telescopes to identify asteroids for mining, and the bona fides of its leaders and employees indicate that it is serious.³⁵ Company president Chris Lewicki, for example, was the flight director for two NASA Mars rover missions.³⁶ He leads more than thirty engineers from NASA's Jet Propulsion Laboratory, and his financial backers include two former chief executives of Google.³⁷

The technological and economic hurdles between private companies and asteroids are daunting, but would-be prospectors also face potential legal challenges. Scholars have suggested that the United Nations should hold sovereignty over territory and resources in outer space, and that prospectors should be made to acquire concessions, leases, or licenses from the United

settlement (reporting on a non-profit organization attempting to raise funding for colonization of Mars); *Human Settlement on Mars in 2023*, MARS ONE, <http://mars-one.com/en/> (last visited Feb. 15, 2013).

33. See *Mission*, PLANETARY RESOURCES, <http://www.planetaryresources.com/mission/> (last visited Mar. 29, 2013) [hereinafter PLANETARY, *Mission*] (describing Planetary Resources' intention to make asteroid materials available for human use); Chang, *supra* note 6, at D3 (asserting that Planetary Resources intends to mine asteroids to support human activity on Earth and in space).

34. See Chang, *supra* note 6, at D3 (describing Planetary Resources's plan to use or sell asteroid resources on Earth and in space); PLANETARY, *Mission*, *supra* note 33 (describing how Planetary Resources intends to supply human activity on Earth and in space).

35. See *Technology*, PLANETARY RESOURCES, <http://www.planetaryresources.com/technology/> (last visited Jan. 9, 2013) (asserting that the satellites, called "Arkyds," will identify target asteroids for prospecting); Marks, *supra* note 28 (explaining that satellite telescopes orbiting the Earth will seek out valuable asteroids).

36. See *Our Team*, PLANETARY RESOURCES, <http://www.planetaryresources.com/team/> (last visited Jan. 9, 2013) [hereinafter PLANETARY, *Our Team*] (explaining that Chris Lewicki was flight director for Mars rovers Spirit and Opportunity); Kirk Johnson, *A Start-Up Sees a Gold Rush Among the Stars*, N.Y. TIMES, Dec. 24, 2012, at A12 (reporting that Mr. Lewicki spent ten years at NASA's Jet Propulsion Laboratory before joining Planetary Resources).

37. See Marks, *supra* note 28 (reporting that Planetary Resources employs more than thirty former NASA engineers and is backed by former Google executives); see also PLANETARY, *Our Team*, *supra* note 36 (describing various NASA veterans at Planetary Resources, and investors Larry Page and Eric E. Schmidt, Google's CEO and former CEO, respectively).

Nations to exploit those resources.³⁸ Part I of this Note examines the history of sovereignty and property rights over newly discovered resources on Earth. Part II considers recent attempts to establish international law for space exploration. In Part III, this Note applies historical precedent and existing law to argue that celestial resources should belong to the prospectors who claim them through physical possession and use, because no government on this planet has sovereignty in outer space.

I. *ABORIGINAL TITLE, EXTRATERRITORIAL SOVEREIGNTY,
AND THE COMMON HERITAGE OF MANKIND*

In Part I.A, this Note considers the property rights of aboriginal settlers, focusing on the example of the first Pacific Islanders. Those pioneers, like today's space explorers, left their homes in the most sophisticated vehicles their society could produce, and crossed the frontier to discover a series of rocky outposts that no people had previously claimed. Part I.B examines the claims of distant European nations over territory in the "New World," including the Pacific Islands. European governments imposed extraterritorial sovereignty upon these lands in much the same way that organs of the United Nations have attempted to assert that body's sovereignty over territory and resources in outer space. Finally, Part I.C discusses unclaimed minerals in the Earth's deep seabed. Some scholars and jurists have argued that these resources are "the common heritage of mankind," which is the same language the United Nations has used to describe space resources.

A. *Aboriginal Title: The Reward of Discovery*

About 3,000 years ago, some men and women in canoes made their way across the Pacific Ocean, using the stars overhead as navigational aids, until they reached the islets of the Kwajalein Atoll, where they made their homes.³⁹ If they had a

38. See, e.g., WILFRED C. JENKS, *THE COMMON LAW OF MANKIND* 398 (1962).

39. See FRANCIS X. HEZEL, *THE FIRST TAINT OF CIVILIZATION* 3 (2000) (describing the settlement of the Marshall Islands); Ward H. Goodenough, *Native Astronomy in Micronesia: A Rudimentary Science*, 73 *SCI. MONTHLY* 105, 105-07 (1951) (describing indigenous celestial navigation in the vicinity of the Marshall Islands); CIA, *Republic of the Marshall Islands*, *WORLD FACTBOOK* (Apr. 12, 2013), <https://www.cia.gov/library/publications/the-world-factbook/geos/rm.html> (explaining that the Kwajalein Atoll is

cartographer among them, or a well-traveled fisherman, he or she would have learned that the only other lands within practical travelling distance were tiny strips of sand and vegetation very much like those of Kwajalein, isolated in the middle of Earth's largest body of water.⁴⁰

When these aboriginal peoples took possession of Kwajalein's islands, they established themselves as the rightful owners of those territories for as long as they chose to occupy them, under a principle that came to be known as aboriginal title.⁴¹ Courts in several countries have consistently ruled that indigenous inhabitants of territory hold aboriginal title to their land by right of first claim and continuous use.⁴² Aboriginal title acknowledges a first inhabitant's right to territory irrespective of whether another government blessed the acquisition of that territory in the first place.⁴³ All that is required to prove aboriginal title is a demonstration of actual, exclusive, and continuous possession of the territory in question since time

one of twenty-nine island chains in what is now the Republic of the Marshall Islands, a northern Pacific multiple-island nation about half-way between Hawai'i and Australia).

40. See *Pacific Ocean Map*, NAT'L GEOGRAPHIC, http://events.nationalgeographic.com/media/files/PACIFIC.OCEAN_GTM.pdf (last visited Dec. 11, 2012) (depicting the location of Kwajalein).

41. See John Briscoe, *The Aboriginal Land Title of the Native People of Guam*, 26 U. HAW. L. REV. 1, 4 (2003) (describing indigenous peoples' right to first-occupied territory as "aboriginal title"); Julie Cassidy, *The Enforcement of Aboriginal Rights in Customary International Law*, 4 IND. INT'L & COMP. L. REV. 59 (1993) (citing uniform state practice in Australia, the United States, New Zealand, and Canada as evidence that aboriginal title is a principle of customary international law); Kent McNeil, *Aboriginal Rights in Canada: From Title to Land to Territorial Sovereignty*, 5 TULSA J. COMP. & INT'L L. 253, 254 (1998) (describing Canadian recognition of aboriginal title to land as early as 1888).

42. See *United States v. Santa Fe Pac. R.R. Co.*, 314 U.S. 339, 347 (1941); see also *Snake or Piute Indians v. United States*, 112 F. Supp. 543, 552 (Ct. Cl. 1953) (holding that claimants can prove aboriginal title by establishing actual, exclusive, and continuous possession since time immemorial); Cassidy, *supra* note 41, at 59 (citing uniform state practice in Australia, the United States, New Zealand, and Canada as evidence that aboriginal title is a principle of customary international law).

43. See Briscoe, *supra* note 41, at 4 (describing how aboriginal title depends on first use and continuous possession, not a foreign government's assertion of sovereignty); Cassidy, *supra* note 41, at 59 (describing aboriginal title as a customary principle of international law that allows for the establishment of property rights without the grant of title by an outside sovereign).

immemorial.⁴⁴ Aboriginal title is therefore a legal recognition of the property rights of claimants who were not preceded by a prior owner.⁴⁵

B. Terra Nullius and the Exercise of Remote Sovereignty

More than 2,000 years after the original settlers arrived on Kwajalein, the inhabitants of nearby Guam were the first Pacific Islanders to encounter Europeans.⁴⁶ On March 6, 1521, a Portuguese mercenary named Ferdinand Magellan anchored his ship near Guam and brought a small party ashore in a landing craft.⁴⁷ The residents of Kwajalein probably encountered their first Europeans fourteen years later, when on January 7, 1535, a crew of Spanish mutineers landed on the Atoll's southernmost island.⁴⁸ The Kwajalein Atoll, like other outposts throughout the Pacific, soon fell under Spanish dominion.⁴⁹

The European agents who first claimed these colonies and possessions did so in accordance with the principle of *terra nullius*.⁵⁰ *Terra nullius* is closely related to aboriginal title because it allows the discoverer of unclaimed lands to acquire and use them.⁵¹ Aboriginal settlers are by definition the occupants of

44. See *Sante Fe Pac. R.R. Co.*, 314 U.S. at 347; see also *Snake or Piute Indians*, 112 F. Supp. at 552 (holding that claimants can prove aboriginal title by establishing actual, exclusive, and continuous possession since time immemorial).

45. See *Sante Fe Pac. R.R. Co.*, 314 U.S. at 347; *Snake or Piute Indians*, 112 F. Supp. at 552.

46. See HEZEL, *supra* note 39, at 1–2 (describing the first encounter between Magellan and the Guamanian Pacific Islanders as the first contact between Europeans and Pacific Islanders); see also ROBERT F. ROGERS, *DESTINY'S LANDFALL: A HISTORY OF GUAM I* (1995) (describing how Guam became the first inhabited island in the Pacific known to Europeans when Magellan landed there in 1521).

47. HEZEL, *supra* note 39, at 1–2.

48. *Id.* at 23 (describing the arrival of the mutineers).

49. Marshall Islands History, ENCYC. BRITANNICA, <http://www.britannica.com/EBchecked/topic/366624/Marshall-Islands/53997/History> (last visited Oct. 23, 2013); *History of the Marshall Islands*, MARSH. IS., <http://www.rmiembassyus.org/History.htm> (last visited Nov. 4, 2013) (describing how Spain ruled what came to be known as the Marshall Islands until 1899).

50. See JESSE DUKEMINIER ET AL., *PROPERTY* 11 (7th ed. 2010) (describing *terra nullius* as European explorers applied it); see also M.F. LINDLEY, *THE ACQUISITION AND GOVERNMENT OF BACKWARD TERRITORY IN INTERNATIONAL LAW* 2 (1926) (describing *territorium nullius* as no sovereign's land).

51. See DUKEMINIER ET AL., *supra* note 50, at 11 (describing a discoverer's rights under *terra nullius*); see also LINDLEY, *supra* note 50, at 2 (describing sovereign acquisition of *territorium nullius*).

lands with no previous resident, so one might call their lands “*terra nullius*.”⁵² As a legal term of art, however, *terra nullius* does not typically describe aboriginal occupation of truly uninhabited lands.⁵³ Instead, the term often refers to the mistaken or dishonest conceit by which Europeans justified their conquests of indigenous peoples’ territories.⁵⁴

Even though the rights of conquest and *terra nullius* granted spoils to victors, European monarchs did not depend exclusively on the speed and martial skill of their explorers to acquire territory.⁵⁵ The Papacy, which exercised some power as an international authority in the late Fifteenth Century, occasionally granted to certain countries the exclusive right to explore and conquer designated areas of the world.⁵⁶ Popes made these grants through Papal Bulls, which first asserted the Papacy’s dominion over the entire Earth, and then ceded to certain monarchs the right to claim territory in specified areas.⁵⁷ One of these Bulls was the Bull *Inter Caetera* of 1493, which divided the undiscovered world along a longitude boundary west of the Azores.⁵⁸ The Bull *Inter Caetera*, reinforced by the Treaty

52. Aboriginal Definition, MERRIAM WEBSTER, <http://www.merriam-webster.com/dictionary/aboriginal> (last visited Mar. 29, 2013) (defining “aboriginal” as “being the first or earliest known of its kind present in a region”).

53. See SHARON KORMAN, *THE RIGHT OF CONQUEST: THE ACQUISITION OF TERRITORY BY FORCE IN INTERNATIONAL LAW AND PRACTICE* 42 (1996) (describing post-colonial accusations that European conquerors adopted the theory of *terra nullius* when they dispossessed native inhabitants).

54. See, e.g., PETER MALANCZUK, *AKEHURST’S MODERN INTRODUCTION TO INTERNATIONAL LAW* 148 (7th ed. 1997); Stuart Banner, *Why Terra Nullius? Anthropology and Property Law in Early Australia*, 23 *LAW & HIST. REV.* 95, 97 (2005) (describing the extent to which British explorers and colonists relied on *terra nullius* to expel indigenous inhabitants).

55. See HEZEL, *supra* note 39, at 8; KORMAN, *supra* note 53, at 8–9 (describing the Papal Bulls through which the Papacy assigned to various European sovereigns the exclusive right to explore and conquer territory).

56. HEZEL, *supra* note 39, at 8.

57. See, e.g., Bull “*Inter Caetera Divinae*” of Pope Alexander VI Dividing the New Continents and Granting America to Spain (May 4, 1493), in *CHURCH AND STATE THROUGH THE CENTURIES* 153, 156–57 (Sidney Z. Ehler & John B. Morrall eds. & trans., 1967) (“[We, the Papacy] give, concede and assign to you . . . solely out of our largess . . . by the authority of Almighty God . . . all the islands and mainlands, found or to be found, discovered or to be discovered [within a designated area] And we concede them by the strength of the present document perpetually with all their dominions, towns, castles, localities and villages and all rights, jurisdictions and appurtenances to you and your heirs and successors . . .”).

58. See *id.*

of Tordesillas the next year, allowed Portugal to claim the ports and sea lanes around Africa's coasts.⁵⁹ The Spanish, being thus denied eastern access to the spice trade, embarked on a series of westward expeditions across the Atlantic in search of a round-the-world route to the East Indies.⁶⁰ This campaign eventually brought the Spanish to the Pacific, Magellan to Guam, and the mutineers to Kwajalein.⁶¹

European notions of conquest and sovereignty had disastrous implications for indigenous peoples.⁶² Weak populations were not the equals of strong European nations in the eyes of international law.⁶³ Due to *terra nullius* and the naked ambition for conquest, international law in the Age of Exploration did little to prevent Europeans from running roughshod over the rights of natives.⁶⁴ While the tragedies that ensued during centuries of European colonialism are well documented and beyond the scope of this Note, one tragedy is worth special mention.⁶⁵ The European monarchs who conquered territories like Kwajalein claimed for themselves an authority known as sovereignty, which included the exclusive

59. See Treaty between Spain and Portugal Concluded at Tordesillas, Spain-Port., June 2, 1494 (reinforcing the division of territory for exploration between East and West, in accordance with the Bull Inter Caetera); Bull Inter Caetera, *supra* note 57; HEZEL, *supra* note 39, at 6–8 (describing treaty-based motivation for Spanish to explore westward).

60. See HEZEL, *supra* note 39, at 6–8 (describing Spain's westward expeditions in search of spices after Portugal monopolized the eastern route).

61. See *Id.* at 2, 23 (describing Magellan's travel to Guam and the mutineers travel to Kwajalein).

62. See KORMAN, *supra* note 53, at 12 (describing how the right of conquest allowed European conquerors to fight unjust wars while asserting moral impunity); MALANCZUK, *supra* note 54, at 148 (describing how the right of conquest disadvantaged weaker societies).

63. See KORMAN, *supra* note 53, at 12.

64. See *Johnson v. M'Intosh*, 21 U.S. 543, 573 (1823) (Justice Marshall observing that "the character and religion of [North America's indigenous] inhabitants afforded an apology for considering them as a people over whom the superior genius of Europe might claim an ascendancy"). *But see* JOHN E. OSTER, THE POLITICAL AND ECONOMIC DOCTRINES OF JOHN MARSHALL 125 (1914) ("[E]very oppression now exercised on a helpless people depending on our magnanimity and justice for the preservation of their existence impresses a deep stain on the American character.").

65. See *generally* MERCEDES MAROTO CAMINO, EXPLORING THE EXPLORERS: SPANIARDS IN OCEANIA, 1519–1794 (2012); *see also* FRANCIS X. HEZEL, STRANGERS IN THEIR OWN LAND (2003) (describing the harms that foreign conquerors inflicted upon Pacific Islanders).

rights to grant and transfer land.⁶⁶ By claiming sovereignty over lands beyond their state borders, the Europeans exercised a type of power that the US Code describes as “extraterritorial sovereignty.”⁶⁷ Extraterritorial sovereignty is a greater imposition of government power overseas than so-called extraterritorial jurisdiction, which nations may occasionally assert over persons outside of their borders.⁶⁸ Whereas extraterritorial jurisdiction would have given European governments the power to regulate the conduct of their explorers overseas, extraterritorial sovereignty gave these foreign governments the power to claim the soil on which their explorers stood, and stop indigenous people from using that territory except at the will of a European government or its colonial successor.⁶⁹ Only in the Nineteenth and Twentieth Centuries did international law finally recognize that indigenous peoples’ original occupancy of land established their legal title to that land.⁷⁰ When Kwajalein achieved independence along with its neighbors in the Twentieth

66. See U.S. CONST. art. I, § 8, cl. 3; *Johnson*, 21 U.S. at 574 (describing how European sovereigns claimed for themselves the right to grant the soil, a right which the US Congress inherited from the British monarchy); Briscoe, *supra* note 41, at 1, 4.

67. 30 U.S.C. § 1402(a) (2012) (distinguishing between “extraterritorial sovereignty” and extraterritorial jurisdiction). The distinction arose in a provision of the Deep Seabed Hard Mineral Resources Act (“DSHMRA”), §§ 1401–1473, a law in which the United States recognized the rights of its citizens to mine for resources in seabed beneath international waters, also known as the deep seabed. See *generally id.* In this particular provision of the DSHMRA, called the “disclaimer of extraterritorial sovereignty,” the United States maintained its *jurisdiction* over United States persons and vessels exploring the deep seabed, but specifically disclaimed any assertion of *sovereignty* over the deep seabed itself, or its resources. See § 1402(a). This Note will return to the deep seabed in Part I.C.

68. See *id.* (distinguishing between extraterritorial jurisdiction over persons and actions, and extraterritorial sovereignty over areas and resources); Brian L. Porto, Annotation, *Extraterritorial Jurisdiction of Federal Courts*, 1 A.L.R. Fed. 2d 415 § 2 (2005) (describing extraterritorial jurisdiction as the extension of United States law over persons overseas); *Johnson*, 21 U.S. at 574 (describing how Europeans dispossessed natives by asserting sovereignty over the New World).

69. Cf. *Johnson*, 21 U.S. at 574; Briscoe, *supra* note 41, at 1, 4; U.S. CONST. art. I, § 8, cl. 3 (describing how European governments claimed for themselves the right to grant the soil, a right which the United States Congress inherited from the British monarchy and expressed affirmatively in its assertion of the exclusive right to regulate land and the commerce upon it); see also 30 U.S.C. § 1402 (describing a claim to areas or resources outside of a nation’s territory as extraterritorial sovereignty, and distinguishing that right from extraterritorial jurisdiction over person and vessels).

70. See *supra* notes 41–45 (explaining how Aboriginal title exists independent of government action, and can be proved by actual, exclusive, and continuous possession since time immemorial).

Century, the Islanders decided to use their territory in a manner that is now of particular interest to space explorers, as we will see in Part III.B.

C. Earth's Deep Seabed: The Common Heritage of Mankind?

The age of land discovery on Earth has effectively ended.⁷¹ Aside from a few newly forming volcanic islands, all of Earth's dry land has been discovered and claimed by one or more sovereigns, or specifically reserved against claim by any sovereign.⁷² Nations also claim the waters immediately adjacent to their coastlines, as well as the seabed beneath their coastal waters.⁷³ Territorial claims in coastal waters form a complex and controversial subject beyond the scope of this Note. For the purpose of analogy to outer space, it is only necessary to understand that nations exercise some sovereignty over the waters and seabeds adjacent to their coastlines, but there are other portions of seabed, far from any coast, that are not subject to any nation's sovereignty.⁷⁴ Scholars refer to these remote portions as collectively "the Area" or "the deep seabed."⁷⁵

As Magellan traversed the Pacific in search of cloves from the Molucca Islands, he could have had no practical concern for the deep seabed more than eleven kilometers beneath him.⁷⁶ He could not know that it contained nodes of gold, silver, nickel, copper, and zinc, as well as other resources.⁷⁷ In Magellan's

71. DUKEMINIER ET AL., *supra* note 50, at 11 (asserting that land discovery has effectively ended).

72. *Id.*

73. See generally George K. Walker, *Filling Some of the Gaps: The International Law Association (American Branch) Law of the Sea Definitions Project*, 32 FORDHAM INT'L L.J. 1336 (2009) (describing various controversies between nations asserting conflicting claims to undersea resources).

74. See Declaration of Principles Governing the Seabed and the Ocean Floor, and the Subsoil Thereof, Beyond the Limits of National Jurisdiction, G.A. Res. 2749 (XXV), U.N. Doc. A/RES/25/2749, pmbl. (Dec. 17, 1970) [hereinafter G.A. Res. 2749] (describing "the Area" outside of national jurisdiction).

75. See *id.*; see also 3 E.D. BROWN, SEABED ENERGY AND MINERALS: THE INTERNATIONAL LEGAL REGIME 3 (2001) (defining "the Area" or "the deep seabed").

76. The average ocean depth is 4.3 kilometers. See *Ocean Facts*, NAT'L OCEANOGRAPHIC & ATMOSPHERIC ADMIN., <http://oceanservice.noaa.gov/facts/oceandepth.html> (last visited Dec. 11, 2012) (describing the Pacific Ocean as eleven kilometers deep in some areas).

77. See NAT'L OCEANOGRAPHIC & ATMOSPHERIC ADMIN., DEEP SEABED MINING, A REPORT TO CONGRESS 3 (Dec. 1995), available at <http://www.gc.noaa.gov/documents/>

time, and for centuries afterward, no legal regime existed to govern the exploration of the deep seabed.⁷⁸ When people developed technology to reach the deep seabed in the Twentieth Century, the territory became the subject of competing interpretations of property rights in international law.⁷⁹

In 1970, the UN General Assembly attempted to assert international authority over the deep seabed and its resources.⁸⁰ The General Assembly passed a resolution entitled the Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, Beyond the Limits of National Jurisdiction (“Declaration of Principles”).⁸¹ The Declaration of Principles called for the establishment of an international legal regime to govern the deep seabed “as soon as possible.”⁸²

In the same document, the General Assembly declared the deep seabed and its resources to be “the common heritage of mankind,” and forbade states and persons, natural or corporate, from appropriating the seabed by any means.⁸³ The Declaration of Principles also called for states, persons, and corporations to refrain from exercising or acquiring rights over resources in the deep seabed, except when granted permission by the international legal regime that the General Assembly hoped to create.⁸⁴

According to the Declaration of Principles, the proposed regime for the deep seabed would govern all exploration of its resources.⁸⁵ The regime would require that miners only explore

gcil_dsm_87_20110607084359.pdf; see also *Seabed Mining: The Unplumbed Riches of the Deep*, *ECONOMIST*, May 16, 2009, at 30 (describing resources in the deep seabed).

78. G.A. Res. 2749, *supra* note 75, pmbl. (“[R]ecognizing that the existing legal regime of the high seas does not provide substantive rules for regulating the exploration of the aforesaid area and the exploitation of its resources.”).

79. See, e.g., G.A. Res. 2749, *supra* note 75, ¶¶ 1–4 (describing deep seabed resources as “the common heritage of mankind,” to be collected and distributed under international supervision). *Contra* Deep Seabed Hard Minerals Resources Act, 30 U.S.C. §§ 1401–1412 (2012) (allowing certain US persons to collect deep seabed resources for themselves).

80. See G.A. Res. 2749, *supra* note 75, ¶¶ 1–4 (asserting international authority over the deep seabed and its resources).

81. *See id.*

82. *Id.*

83. *Id.* ¶¶ 1–3 (prohibiting national claims over the seabed).

84. *Id.* ¶ 3 (prohibiting the acquisition of rights to the seabed).

85. *Id.* ¶ 4 (describing the hoped-for regime).

and exploit the seabed for mankind's benefit as a whole.⁸⁶ The regime would also manage deep seabed mining to provide expanding opportunities for its use and ensure equitable sharing of its benefits among states, giving "particular consideration" to developing and land-locked nations.⁸⁷ Industrialized nations refused to accept the Declaration of Principles as legally binding and declined to recognize its assertions as even an interim regime over the deep seabed, specifically rejecting the "common heritage of mankind" language.⁸⁸

In 1982, the United Nations attempted to establish a deep seabed legal regime when it proposed the United Nations Convention on the Law of the Sea ("UNCLOS"), which came into force (at least for the nations that ratified it) in 1994.⁸⁹ After decades of negotiation and modification, UNCLOS still echoes the language of the 1970 Declaration of Principles: the deep seabed and its resources are "the common heritage of mankind."⁹⁰ UNCLOS created the International Seabed Authority ("ISA"), a UN regulator to govern exploration in the deep seabed.⁹¹ UNCLOS required the ISA to distribute the proceeds of seabed mining to developing nations, and even directed the ISA to transfer seabed miners' technology to those nations.⁹² UNCLOS also limited mining activity in the deep seabed to UNCLOS's States Parties, or persons and companies

86. *Id.*

87. *Id.* ¶ 9 (explaining the purpose of the regime).

88. See BROWN, *supra* note 76, at 3 (describing industrial nations' objections to the G.A. Res. 2749).

89. See United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS]; see also BROWN, *supra* note 76, at 4 (explaining that the General Assembly proposed UNCLOS in 1982). No western developed nation joined for twelve years, which led to a compromise "Protocol of 1994." The compromise somewhat loosened the requirements for sharing deep seabed resources. Most developed nations, except the United States, accepted the compromise and joined UNCLOS. See Richard J. McLaughlin, *Settling Trade-Related Disputes over the Protection of Marine Living Resources: UNCLOS or the WTO?*, 10 GEO. INT'L ENVTL. L. REV. 29, 36 (1997).

90. UNCLOS, *supra* note 90, art. 136 (declaring the Area and its resources to be the common heritage of mankind).

91. *Id.* art. 156 (establishing the International Seabed Authority).

92. *Id.* arts. 140, 144, 160 (mandating the transfer of resources and technology from seabed miners to other nations).

they controlled.⁹³ The only other organization allowed to mine the deep seabed under UNCLOS would be a new entity called “the Enterprise,” a UN-operated mining company, which would take funds and technology from other seabed miners, mine portions of the seabed where the other miners discovered resources, and distribute its profits throughout the world.⁹⁴ While the ISA currently operates from its headquarters in Jamaica, the Enterprise does not yet exist.⁹⁵

The United States has consistently rejected, through statements at the United Nations and in domestic law, the authority of any organization, including the ISA, to govern access to minerals beneath international waters.⁹⁶ The United States, like other industrialized nations, asserted after the first UNCLOS proposal that the freedom of the high seas allows all states to engage in deep seabed mining without international regulation.⁹⁷ While many industrialized nations eventually compromised on the issue of seabed mining in order to accede to UNCLOS and gain its other benefits, the United States has still not ratified the Convention.⁹⁸ UNCLOS opponents point to its common heritage principle and the ISA’s claim of effective

93. *Id.* art. 153 (prohibiting mining by non-States Parties).

94. *Id.* arts. 153, 170 (requiring seabed miners to identify multiple potentially valuable mining sites so that the Enterprise can choose to mine one of the sites itself using technology and startup funding provided by the miners).

95. *See About Us*, INT’L SEABED AUTH. (Apr. 2009), <http://www.isa.org.jm/en/about> (describing the ISA organization, illustrating that the Enterprise does not yet exist).

96. *See* Note by the Secretariat, UN Doc. A/CONF.62/WS/37 (1983), in 17 THIRD UNITED NATIONS CONFERENCE ON THE LAW OF THE SEA 243, UN Sales No. E.84.V.3 (1984) [hereinafter *US Statement*] (statement by the United States of America); *see also* 30 U.S.C. § 1401(a)(12) (2012) (asserting that “exploration for and commercial recovery of hard mineral resources of the deep seabed are freedoms of the high seas subject to a duty of reasonable regard to the interests of other states in their exercise of those and other freedoms recognized by general principles of international law”).

97. *See US Statement*, *supra* note 96; *see also* BROWN, *supra* note 76, at 18 (describing the American position with regard to deep seabed mining).

98. *See Status of the United Nations Convention on the Law of the Sea, of the Agreement Relating to the Implementation of Part XI of the Convention and of the Agreement for the Implementation of the Provisions of the Convention Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks*, UNITED NATIONS, 8 (Sept. 18, 2013), http://www.un.org/Depts/los/reference_files/status2010.pdf (illustrating that the United States has not ratified UNCLOS); *see also* BROWN, *supra* note 76, at 4.

sovereignty over the deep seabed as some of the issues preventing ratification.⁹⁹

UNCLOS proponents have argued that international sovereignty over the deep seabed is necessary to establish a firm foundation of property rights so as to encourage exploration.¹⁰⁰ However, the experience of deep seabed explorers during UNCLOS's development does not support this assertion.¹⁰¹ The United States' refusal to accede to UNCLOS has not prevented American companies from claiming and exploring regions of the deep seabed in preparation for mining.¹⁰² As early as 1986, the US Mission to the United Nations formally notified the United Nations that the US government had given American companies permission to explore and exploit the deep seabed in the Clarion-Clipperton Zone, which lies five kilometers below the surface of the Pacific Ocean, about halfway between Hawai'i and Mexico.¹⁰³ Although technical difficulties still render seabed mining unprofitable, several business ventures have successfully extracted tons of manganese nodules, nickel, copper, and cobalt from the deep seabed in the eastern Pacific.¹⁰⁴

99. See Steven Groves, *Opening Remarks, Panel V-Debate: Resolved: The Senate Should Give Prompt Advice and Consent to the Law of the Sea Convention*, in THE LAW OF THE SEA CONVENTION, US ACCESSION AND GLOBALIZATION 105 (Nordquist et al. eds., 2012) (criticizing UNCLOS and its common heritage principle).

100. Ambassador John Norton Moore, *Opening Remarks, Panel V-Debate: Resolved: The Senate Should Give Prompt Advice and Consent to the Law of the Sea Convention*, in THE LAW OF THE SEA CONVENTION, *supra* note 99, at 100 (arguing that the International Seabed Authority is necessary to establish the stable property rights necessary to enable American industries to invest in resource exploitation in the deep seabed).

101. Steven Groves, *The US Can Mine the Deep Seabed Without Joining the UN Convention on the Law of the Sea*, HERITAGE FOUND. BACKGROUNDER, Dec. 4, 2012, at 1, 5 (asserting that United States non-accession to UNCLOS is not holding back deep seabed mining); INT'L SEABED AUTH., Draft Environmental Management Plan for the Clarion-Clipperton Zone, ISBA/17/LTC.WP.1 5 (Jan. 28, 2011), available at <http://www.isa.org.jm/files/documents/EN/17Sess/LTC/ISBA-17LTC-WP1.pdf> (describing current American efforts to mine the deep seabed).

102. See Groves, *supra* note 101, at 5; ISA, *supra* note 101.

103. See Office of the Special Representative of the Secretary-General for the Law of the Sea, *Law of the Sea Bulletin*, no. 7 iii (Apr. 1986) [hereinafter *Law of the Sea Bulletin*] (describing how the Bulletin is a UN publication detailing the ratification status of the UNCLOS, as well as national laws, regulations and other actions affecting the law of the sea); see also Groves, *supra* note 102, at 17.

104. See THOMAS GANGALE, THE DEVELOPMENT OF OUTER SPACE: SOVEREIGNTY AND PROPERTY RIGHTS IN INTERNATIONAL LAW 83 (2009) (describing seabed mining, its successful extractions, and its economic failures).

The United Nations published the claims of US companies to the Clarion-Clipperton Zone in its *Law of the Sea Bulletin*, a registry of claims at sea.¹⁰⁵ While the United Nations explicitly denies that it recognizes these claims, it stands to reason that publicizing claims reduces confusion and the potential for conflict.¹⁰⁶ Controversies persist, but thanks to the *Law of the Sea Bulletin* and other dispute resolution mechanisms, conflicts between explorers are not as problematic now as they were in the days of Magellan.¹⁰⁷

Proponents of the common heritage principle also argue that it will help preserve the deep seabed's natural environment.¹⁰⁸ They point out that the absence of international governance may have serious consequences for the current inhabitants of the ocean floor.¹⁰⁹ Areas like the Clarion-Clipperton Zone probably contain more than one thousand species of plant and animal life, many of which are still unknown to the scientific community.¹¹⁰ Mining the ocean floor may disturb or destroy some of these species, and significantly harm their ecosystem.¹¹¹

II. LAW ON THE FINAL FRONTIER

This Part examines the United Nations' right to establish sovereignty over territory and resources in outer space, which we will call extraterrestrial (as opposed to extraterritorial) sovereignty. Part II.A discusses legal and policy reasons

105. See *Law of the Sea Bulletin*, *supra* note 103 (listing claims to deep seabed resources).

106. See *id.* (disclaiming recognition of publicized claims).

107. See, e.g., NATALIE KLEIN, DISPUTE SETTLEMENT IN THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA 342 (2004) (describing dispute resolution under UNCLOS).

108. See UNCLOS, *supra* note 89, art. 145; see also BROWN, *supra* note 76, at 53 (stating that the common heritage of mankind's *ratione materiae*, or subject matter jurisdiction, extends to environmental protection).

109. See Jan Magne Markussen, *Deep Seabed Mining and the Environment*, in GREEN GLOBE YEARBOOK 33 (Helge Ole Bergesen & Georg Parmann eds., 1994) (describing the dangers of deep seabed mining for flora and fauna on the ocean floor).

110. See Brigitte Ebbe et al., *Diversity of Abyssal Marine Life*, in LIFE IN THE WORLD'S OCEANS 154 (Alasdair D. McIntyre ed., 2010) (describing flora and fauna on the ocean floor).

111. See Markussen, *supra* note 109, at 33 (describing environmental harms arising from deep seabed mining).

supporting UN extraterrestrial sovereignty. Part II.B follows with the arguments against UN extraterrestrial sovereignty.

A. Extraterrestrial Sovereignty

For the first 4.5 billion years of its existence, the Moon was like all other celestial bodies in the universe: human activity had never disturbed it.¹¹² The Moon orbited around the blue planet, controlling Earth's tides and bearing the occasional impacts of asteroids, meteors, and comets.¹¹³ Then, on September 12, 1959, a rocket launched from the Soviet Republic of Kazakhstan, propelling a 359-kilogram metal sphere out of Earth's atmosphere and onto a collision course with the Moon.¹¹⁴ This little unmanned spacecraft slammed into the Moon and scattered small metal objects bearing the Soviet Union's hammer and sickle emblem across the lunar surface.¹¹⁵ Upon learning of the Soviets' success, the US State Department immediately announced that the Soviet probe had not legally claimed the Moon.¹¹⁶ Although the Soviets explicitly denied that their landing constituted a territorial claim, the Luna 2 mission inspired efforts at the United Nations to establish an international regime for control of outer space.¹¹⁷

1. The Outer Space Treaty

The first UN effort to govern space activity culminated with the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and

112. *Earth's Moon: Read More*, NASA, <http://solarsystem.nasa.gov/planets/profile.cfm?Object=Moon&Display=OverviewLong> (last visited Mar. 29, 2013) (describing the natural history of the Moon prior to the first human probe landing).

113. *See id.*

114. *Luna 2*, NASA, <http://nssdc.gsfc.nasa.gov/nmc/masterCatalog.do?sc=1959-014A> (last visited Dec. 11, 2012) (describing the Soviet space program's Luna 2 mission).

115. *See id.*; *see also* Max Frankel, *Soviet Rocket Hits Moon After 35 Hours; Arrival Is Calculated Within 84 Seconds; Signals Received Till Moment of Impact*, N.Y. TIMES, Sept. 14, 1959, at 1 (reporting Luna 2's successful landing).

116. *See* Peter Kihss, *US Rejects Any Flag-Planting as Legal Claim to Rule Moon*, N.Y. TIMES, Sept. 14, 1959, at 1 (reporting United States' rejection of any hypothetical territorial claim).

117. *See* Peter Kihss, *Pleas Are Expected to Mount for UN Control of Outer Space*, N.Y. TIMES, Sept. 15, 1959, at 20 (reporting on United States' advocacy for an international convention regarding space activity).

Other Celestial Bodies (“Outer Space Treaty”), which the United States signed and ratified in 1967.¹¹⁸ The Outer Space Treaty is widely accepted.¹¹⁹ Some scholars contend that the Treaty is customary international law in its entirety, whereas others believe that only its first four articles are universally binding.¹²⁰

The Outer Space Treaty, along with four other treaties, established the basic principles of international law in outer space.¹²¹ Article I of the Outer Space Treaty describes outer space in general as “the province of all mankind,” and requires that space exploration benefit all countries, irrespective of their degree of scientific development.¹²² It goes on to demand that space be open for use and exploration by all countries, including access for scientific investigation.¹²³ Article II specifically prohibits “national appropriation” of celestial bodies by claim of sovereignty, means of use or occupation, or “any other means.”¹²⁴ The Treaty applies to non-state actors as well: article VI holds States Parties to the Outer Space Treaty responsible for ensuring that the “national activities” of their non-governmental organizations comply with its provisions.¹²⁵

118. See Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty]; see also Kelly M. Zullo, *The Need to Clarify the Status of Property Rights in International Space Law*, 90 GEO. L.J. 2413, 2415 n.12 (2002) (describing the ratification of the Outer Space Treaty).

119. See LYALL & LARSEN, *supra* note 1, at 178 (describing the widespread acceptance of the Outer Space Treaty).

120. See Eileen Galloway, *The History and Development of Space Law: International Law and the United States Law*, 7 ANNALS AIR & SPACE L. 295, 300 (1982); see also Heidi Keefe, *Making the Final Frontier Feasible*, 11 SANTA CLARA COMPUTER & HIGH TECH. L.J. 345, 352–53 (1995); LYALL & LARSEN, *supra* note 1, at 180 (describing various opinions regarding the binding nature of treaty provisions).

121. See Keefe, *supra* note 120, at 345 (describing the other four treaties as “the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of April 1968 (the Astronaut Agreement), the Convention on International Liability for Damage Caused by Space Objects of March 1972 (the Liability Convention), the Convention on the Registration of Objects Launched into Outer Space of January 1975 (the Registration Convention), and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies of December 1979 (the Moon Agreement).”).

122. See Outer Space Treaty, *supra* note 118, art. I (providing for free access to space).

123. *Id.*

124. *Id.* art. II (prohibiting national appropriation of space).

125. *Id.* art. VI (holding nations responsible for the actions of their citizens).

The Treaty also asserts two environmental interests.¹²⁶ It requires States Parties to avoid adversely affecting Earth's environment through space activities.¹²⁷ It also admonishes States Parties to avoid harmful contamination of celestial bodies during exploration.¹²⁸

The Outer Space Treaty's prohibition against sovereignty and appropriation in space has led some scholars to conclude that celestial bodies are *res extra commercium*, and cannot be owned.¹²⁹ Some read the "national activities" provision as a prohibition against individual space property.¹³⁰

2. The Moon Agreement

The United Nations established the Committee on the Peaceful Uses of Outer Space ("COPUOS") at the urging of the United States in 1959.¹³¹ COPUOS publishes documents applying international law to space.¹³² It also negotiates space treaties on behalf of the United Nations.¹³³ In 1979, following initiatives by the United States and Argentina, COPUOS proposed to the General Assembly a document that became the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies ("Moon Agreement").¹³⁴ The Moon

126. *Id.* art. IX (establishing environmental preservation rules).

127. *Id.* (requiring States Parties to avoid adversely affecting Earth's environment through the introduction of extraterrestrial material).

128. *Id.* (requiring States Parties to avoid harmful contamination of celestial bodies).

129. *See, e.g.,* LYALL & LARSEN, *supra* note 1, at 184 (describing scholarly arguments that celestial bodies cannot be owned).

130. *See, e.g.,* Carl Q. Christol, *Article 2 of the 1967 Principles Treaty Revisited*, in 9 ANNALS OF AIR AND SPACE LAW 217-44 (Nicolas Mateesco Matte ed., 1984) (asserting that no one can claim property in space).

131. *See* International Co-operation in the Peaceful Uses of Outer Space, G.A. Res. 1472, ¶ 1, U.N. GAOR, 14th Sess., Supp. No. 13 (Dec. 9, 1959) [hereinafter G.A. Res. 1472] (establishing COPUOS); *United Nations Committee on the Peaceful Uses of Outer Space*, UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS <http://www.oosa.unvienna.org/oosa/COPUOS/copuos.html> (last visited Dec. 11, 2012) [hereinafter UNOOSA] (describing COPUOS and its location); *see also* Zullo, *supra* note 119, at 2417 (describing COPUOS and its establishment).

132. G.A. Res 1472 (XIV), *supra* note 131, at 5.

133. *Id.*

134. *See* Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 5, 1979, 610 U.N.T.S. 205 [hereinafter Moon Agreement]; *see also* GANGALE, *supra* note 78, at 70 (describing how, ironically, the capitalist United States

Agreement, which entered into force for its States Parties in 1984, declares celestial bodies and their resources to be the common heritage of mankind.¹³⁵ It contemplates the future creation of an international regime, to govern all celestial bodies in Earth's solar system as soon as the exploitation of space resources is about to become feasible.¹³⁶ The regime would then ensure the equitable distribution on Earth of resources from space.¹³⁷

The Moon Agreement's planned-for regime would effectively assert UN sovereignty over space territory by prohibiting States from recovering celestial materials, except samples for scientific research, and forbidding States from using areas of celestial bodies except as research stations, launch pads, and logistical staging areas.¹³⁸ The Agreement pointedly rejects individual acquisition of property in or on celestial bodies.¹³⁹ The Moon Agreement also includes strict environmental provisions.¹⁴⁰ Under the Agreement's proposed regime, explorers would only use celestial bodies to the extent necessary for scientific research.¹⁴¹ The regime would also prohibit pollution of celestial environments and require States Parties to inform the Secretary General of all measures taken to ensure compliance.¹⁴²

inserted common heritage language into the Moon Agreement against the wishes of the socialist Soviet Union).

135. See Moon Agreement, *supra* note 134, arts. 1 para. 1, 11 para. 1 (asserting that celestial bodies are the common heritage of mankind).

136. See *id.* art. 11 para. 5 (requiring States Parties to establish the described space-governance regime as soon as resource exploitation is about to become feasible).

137. See *id.* art. 11 para. 7(d) (requiring the equitable sharing of celestial resources among all States Parties, "whereby the interests and needs of developing countries . . . shall be given special consideration"); see also Carol R. Buxton, *Property in Outer Space: The Common Heritage of Mankind Principle vs. the "First in Time, First in Right" Rule of Property Law*, 69 J. AIR L. & COM. 689, 699 (2004) (noting that the Moon Agreement envisions a regime "reminiscent of the regime established to regulate exploitation of the seabed").

138. See Moon Agreement, *supra* note 134, art. 6 para. 2 (regulating removal of resources); *id.* art. 8 (regulating logistics sites).

139. See *id.* art. 11 (prohibiting acquisition of property).

140. See *id.* art. 7 (providing for the protection of the environment in space).

141. See *id.* art. 9 (regulating scientific research in space).

142. See *id.*

3. Property without Sovereignty?

Another argument supporting UN sovereignty over celestial bodies is the theory that no one may own property except with the permission of a government.¹⁴³ The argument goes that only a government with sovereignty over territory may grant property rights to an individual.¹⁴⁴ A similar argument holds that while property rights are theoretically possible without a government's grant of title, such rights are practically useless without the protection of a sovereign power.¹⁴⁵ Since the Outer Space Treaty precludes national sovereignty in space, proponents of this theory assert that no one can acquire private property on celestial bodies.¹⁴⁶

Some scholars have argued that a new international legal regime is necessary to grant property rights in space.¹⁴⁷ Proposals include a resource distribution mechanism modeled on the ISA, an internationally regulated market, and an essentially hands-off approach in which private companies claim asteroids (but not larger bodies like planets and moons) as chattels rather than real property.¹⁴⁸

4. American Asteroid Law

The US government is apparently undecided on the issue of private property in space.¹⁴⁹ However, a State Department

143. See LYALL & LARSEN, *supra* note 1, at 184 (describing scholarly arguments that celestial bodies cannot be owned).

144. *Id.*

145. See, e.g., GANGALE, *supra* note 78, at 10 (“Outside [a controlling legal regime], where a state of anarchy prevails, any claim to property must be defended by the force of arms; it is not a right, but a physical fact of occupation.”).

146. See *id.*

147. See, e.g., ZULLO, *supra* note 118, at 2338 (arguing that a new authority is required to govern for-profit exploration).

148. See Keefe, *supra* note 120, at 369 (describing the International Seabed Authority as a potential model for UN regulation in space); see also Lynn M. Fountain, *Creating Momentum in Space: Ending the Paralysis Produced by the “Common Heritage of Mankind” Doctrine*, 35 CONN. L. REV. 1753, 1774 (2003) (proposing a regulated market in space resources); 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, 580 (2012) (proposing an unregulated market for asteroid acquisition).

149. Compare Letter from Ralph A. 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. 3, 2003) [hereinafter Braibanti letter], available at <http://www.erosproject.com/exhibit01.html>

letter arising from a unique legal controversy gives some credence to supporters of UN sovereignty in space.¹⁵⁰ The issue arose in 2001, when aerospace consultant Gregory Nemitz published on a website his own claim to asteroid 433 Eros, just before NASA's probe reached that object.¹⁵¹ In a letter to Nemitz, NASA's general counsel pointed out that, unlike deep seabed miners who enjoy American statutory law explicitly authorizing and recognizing their claims, space property claimants have no such protection.¹⁵² In a subsequent letter on the same subject, a State Department official categorically denied that that a person may own an asteroid.¹⁵³

Three years later, the United States District Court for the District of Nevada rejected Nemitz's claim that NASA should pay him US\$0.20 per year to park its probe on "his" asteroid.¹⁵⁴ The court found that the website on which he registered his claim conferred no property rights.¹⁵⁵ Nemitz failed to demonstrate that either the Ninth Amendment or the Tenth Amendment to the US Constitution provided a legal cause of action against NASA.¹⁵⁶ The court also rejected Nemitz's assertion that a Congressional statute, codified at 42 U.S.C. § 42, which required NASA to encourage commercial use of space, established

(last visited Dec. 11, 2012) (asserting that the Outer Space Treaty prohibits private property in space), *with* STAFF OF SENATE COMM. ON COMMERCE, SCI. & TECH., 96TH CONGRESS, AGREEMENT GOVERNING THE ACTIVITIES OF STATES ON THE MOON AND OTHER CELESTIAL BODIES 465–66 (Comm. Print 1980) [hereinafter SENATE COMMITTEE REPORT] (advising Congress not to ratify the Moon Agreement in order to uphold property rights in space).

150. *See* Braibanti letter, *supra* note 149 (asserting that the Outer Space Treaty prohibits private property in space).

151. *See* *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. Nat'l Aeronautics & Space Admin.*, 126 F. App'x 343 (9th Cir. 2005) ("There is absolutely no legal basis for asserting that such a[n online] registry creates a property interest in the asteroid.").

152. Letter from Edward A. Frankle, General Counsel, NASA, to Gregory Nemitz, Chief Executive Officer, Orbital Development (Apr. 9 2001), *available at* <http://www.erosproject.com/exhibit02.html> (last visited Dec. 11, 2012) (citing Deep Seabed Hard Minerals Resources Act, 30 U.S.C. §§ 1401–1473).

153. *See* Braibanti letter, *supra* note 149.

154. *See Nemitz*, 2004 WL 3167042 at *1 (finding that the Archimedes Institute, on whose website Nemitz registered his claim, specifically disclaimed any authority to confer property rights).

155. *See id.*

156. *See id.*

Nemitz's property right on an asteroid.¹⁵⁷ Finally, the court held that neither the United States' rejection of the Moon Agreement, nor its ratification of the Outer Space Treaty, created any rights for Nemitz to appropriate property in an asteroid.¹⁵⁸

B. *Free Space*

In the dark, cold vacuum of space, a certain gray rock orbits the Sun in an elliptical pattern never closer than 134 million kilometers from the yellow star.¹⁵⁹ On Earth, the rock is known as asteroid 1999 RQ36, and the best estimate of modern science is that its natural orbit will never bring it closer than 445,738 kilometers from the Vienna International Center, where COPUOS holds its sessions.¹⁶⁰ As of this writing, 1999 RQ36 is several million kilometers away from Vienna, and yet the Moon Agreement asserts that the United Nations and COPUOS should exercise sovereignty over this object and others like it.¹⁶¹

1. The Limits of the Outer Space Treaty

The most significant space convention, the Outer Space Treaty, lacks any explicit mention of property rights.¹⁶² It does not, however, specifically reject individual or corporate property in space.¹⁶³ The treaty only prohibits "national appropriation" of space by claim of sovereignty, use, occupation, or other

157. *See id.*

158. *See id.* at *2.

159. *1011955 1999 RQ36 Earth Impact Risk Summary*, NASA, <http://neo.jpl.nasa.gov/risk/a101955.html> (last visited March 3, 2013) (describing the physical properties of 1999 RQ36, including its orbital pattern).

160. *See id.*; UNOOSA, *supra* note 137 (describing COPUOS and its location in Vienna).

161. *See Earth Impact Risk Summary*, *supra* note 159; UNOOSA, *supra* note 137; *supra* notes 140–52 and accompanying text (describing COPUOS and its attempts to prohibit private acquisitions of property through the Moon Agreement).

162. *Compare* Outer Space Treaty, *supra* note 118, arts. I, II, VI, *with* Moon Agreement, *supra* note 134, art. 11; *see also* Keefe, *supra* note 120, at 359 (explaining that the Moon Agreement is more explicit than the Outer Space Treaty with regard to barring ownership claims).

163. *See* Keefe, *supra* note 120, at 359 (explaining that the Moon Agreement is more explicit than the Outer Space Treaty with regard to barring ownership claims).

means.¹⁶⁴ The drafters of the Outer Space Treaty chose to limit this prohibition to nations, even though scholars at the International Institute of Space Law had suggested that the Treaty should prohibit “national and private appropriation.”¹⁶⁵ While the governments that acceded to the Treaty clearly gave up their own ability to claim space property for themselves, they did not give up their citizens’ rights to acquire such property privately. After all, human beings have a universal right to own property.¹⁶⁶ Reading a categorical rejection of property rights into the treaty might contradict article 17 of the Universal Declaration of Human Rights, which guarantees the personal property right.¹⁶⁷

As the Outer Space Treaty recognizes, no government on this planet has sovereignty in space, which means that no government may grant or deny resources in space to anyone.¹⁶⁸ The Treaty does hold States Parties responsible for ensuring that their citizens obey its provisions, which prevent individuals and corporations from claiming property in space on behalf of their governments.¹⁶⁹ It does not, however, prevent those same persons from claiming property for themselves, because such a claim would not violate the treaty’s prohibition on *national* appropriation.¹⁷⁰

The Outer Space Treaty uses the words “province of mankind” to describe space, but this language does not mean

164. See Outer Space Treaty, *supra* note 118, art. II (prohibiting national appropriation).

165. See Int’l Inst. of Space Law, Draft Resolution of the International Institute of Space Law Concerning the Legal Status of Celestial Bodies, in *Proceedings, 40th Colloquium on the Law of Outer Space*, American Institute of Aeronautics and Astronautics 351 (1965).

166. See Universal Declaration of Human Rights, G.A. Res. 217 (III) A, U.N. Doc. A/RES/3/217(III), art. 17 (Dec. 10, 1948) [hereinafter Universal Declaration of Human Rights] (guaranteeing an individual’s right to own property); Keefe, *supra* note 120, at 359 (noting that “[t]he literalist approach [to Articles II and VI of the Outer Space Treaty] is not popular because it is not always compatible with the intent behind the words found in the treaty at the time of drafting”).

167. See Universal Declaration of Human Rights, *supra* note 166, art. 17; Keefe, *supra* note 120, at 359.

168. See Outer Space Treaty, *supra* note 118, art. II (prohibiting claims of sovereignty).

169. See *id.* art. VI (holding States Parties responsible for their citizens’ compliance with the Outer Space Treaty).

170. See *id.* art. II (prohibiting national appropriation).

that mankind owns space collectively.¹⁷¹ The drafters of the Outer Space Treaty understood the “province” language to connote celestial bodies’ availability for use by all states on Earth, not joint ownership.¹⁷² The distinction between common use and joint ownership reflects philosopher John Locke’s articulation of communal and personal property on Earth:

Though the Earth . . . be common to all men, yet every man has a *Property* in his own *Person*. . . . Whatsoever then he removes out of the State that Nature hath provided, and left it in, he hath mixed his *labour* with, and joynd to it something that is his own, and thereby makes it his *Property*.¹⁷³

The Outer Space Treaty’s admonishment that explorers avoid “harmful contamination” of celestial bodies could amount to an assertion of sovereignty over those bodies.¹⁷⁴ However, reading this modestly worded warning in context indicates that the Treaty only asserted jurisdiction over explorers, and not sovereignty over celestial bodies and their resources.¹⁷⁵ The article in which the environmental language appears, article IX, encourages cooperation and mutual assistance, and asks States Parties to act with due regard for each others’ interests.¹⁷⁶ It goes on to discourage States Parties from interfering with each other, indicating that the “contamination” ban is meant to protect astronauts, not space rocks.¹⁷⁷

The arguments in this section have asserted that no international sovereignty over celestial bodies arises from the Outer Space Treaty. Even if such sovereignty did exist, it is not clear that it would apply to asteroids. The term “celestial body”

171. See Zullo, *supra* note 118, at 2419 ((quoting U.S.S.R. Working Paper, Annex I, at 24–25, UN Doc. A/AC.105/115 (Mar. 28, 1973) [hereinafter U.S.S.R. Working Paper])) (describing the “province of all mankind” language as meaning that space resources are subject to “the undivided and common use of all states on Earth . . . not joint [ownership] by them.”).

172. See *id.*

173. See JOHN LOCKE, TWO TREATISES OF GOVERNMENT 305–06 (Peter Laslett ed., Cambridge Univ. Press 2d ed., 1967) (1690).

174. See Outer Space Treaty, *supra* note 118, art. IX (admonishing explorers to avoid harmful contamination of celestial bodies).

175. See *id.*

176. See *id.*

177. See *id.*

has no firm legal definition.¹⁷⁸ It is not certain whether “celestial body” applies to all natural objects (including asteroids) or only to planets.¹⁷⁹ Planets, after all, are somewhat arbitrarily distinguished from asteroids by their size.¹⁸⁰ The Outer Space Treaty and its provisions might therefore apply to Earth’s Moon and the named planets of the solar system, or to the moons circling those planets, or to any rock in space.¹⁸¹

2. The Failure of the Moon Agreement

COPUOS apparently conceded its inability to prevent the commercial use of space resources when, in 1976, the Committee refused to adopt an Italian proposal that would have prohibited the collection of celestial samples for economic profit.¹⁸² COPUOS later recommended the Moon Agreement, which attempted to lay the foundation for international sovereignty in space.¹⁸³ The Moon Agreement, however, is neither positive nor customary international law.¹⁸⁴ Only thirteen nations have ratified the Agreement, and none of them are independently space-competent.¹⁸⁵ Ironically, the Union of

178. See LYALL & LARSEN, *supra* note 1, at 175 n.2 (explaining that “celestial body” is not defined).

179. See *id.*

180. See *Resolution B5: Definition of a Planet in the Solar System*, INT’L ASTRONOMICAL UNION (2006), available at http://www.iau.org/static/resolutions/Resolution_GA26-5-6.pdf (defining a planet as a body in orbit around the Sun, with sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape, and that has cleared the neighborhood of other bodies around its orbit).

181. See LYALL & LARSEN, *supra* note 1, at 175 n.2 (explaining that “celestial body” is not defined).

182. Report of the Legal Subcommittee of the Peaceful Uses of Outer Space on the Work of its Fifteenth Session, U.N.Doc. A/AC.105/171 (May 28, 1976) (refusing to adopt an Italian proposal that would prohibit the return of scientific samples).

183. See Moon Agreement *supra* note 134, arts. 6, 7, 9, & 11 (establishing the foundation for a UN regime that would exercise sovereignty over resources in space).

184. See LYALL & LARSEN, *supra* note 1, at 178; Standing Committee on the Status of International Agreements Relating to Activities in Outer Space, *Annual Report*, INT’L INST. SPACE L. OF THE INT’L ASTRONAUTICAL FED’N 6, 16 (2002), available at http://www.iislweb.org/docs/2002_StandingCommittee.pdf (recording that the only States Parties to the Moon Agreement are Australia, Austria, Belgium, Chile, Kazakhstan, Lebanon, Mexico, Morocco, The Netherlands, Pakistan, Peru, the Philippines, and Uruguay).

185. See LYALL & LARSEN, *supra* note 1, at 178; Standing Committee on the Status of International Agreements Relating to Activities in Outer Space, *supra* note 184, at 6, 16.

Soviet Socialist Republics staunchly opposed the Moon Agreement and its collectivist ideals, and the Russian Federation has done so as well.¹⁸⁶ In the United States, a Congressional committee report listed the Agreement's risks to property rights among the reasons not to ratify it.¹⁸⁷ The committee asserted, as did other nations' governments, that the property provisions of the Moon Agreement would discourage private investment in the space industry.¹⁸⁸

3. US Enterprises

As noted above, the US government has not established a firm stance on the issue of property rights in space. Congress has encouraged commercial space activity through measures such as the 2010 National and Commercial Space Programs Law, which requires that NASA facilitate space commerce.¹⁸⁹ On the other hand, State Department official Braibanti's letter to Gregory Nemitz, which broadly rejected property rights in space, took exactly the position that the US Congress refused to adopt when it turned down the Moon Agreement.¹⁹⁰

In the Nevada District Court, which turned down his property claim, Gregory Nemitz explicitly declined to request a declaratory judgment regarding his ownership interest in 433 Eros.¹⁹¹ Therefore, the court's subsequent reasoning regarding the possibility of claiming property rights in space is probably

186. See LYALL & LARSEN, *supra* note 1, at 178; Standing Committee on the Status of International Agreements Relating to Activities in Outer Space, *supra* note 184, at 6, 16; see also Gangale, *supra* note 78, at 70 (describing Soviet resistance to the Moon Agreement and its common heritage language).

187. See SENATE COMMITTEE REPORT, *supra* note 152, at 465–66 (expressing concern about “common heritage” property rights).

188. See *id.* at 465–66; see also LYALL & LARSEN, *supra* note 1, at 195–96 (listing concerns that the Moon Agreement would discourage space commerce).

189. National and Commercial Space Programs, 51 U.S.C. § 20102(c) (2012) (encouraging commerce in space).

190. Compare Braibanti letter, *supra* note 160, with SENATE COMMITTEE REPORT, *supra* note 183 (illustrating discord between the State Department's assertion that the Outer Space Treaty precluded property rights, and Congress's rejection of the Moon Agreement due to its denigration of property rights in space).

191. See *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. Nat'l Aeronautics & Space Admin.* 126 F. App'x 343 (9th Cir. 2005) (noting that Nemitz had expressly disclaimed interest in a declaratory judgment regarding his ownership interest, and holding that he had thus failed to make a cognizable claim).

non-binding dicta.¹⁹² Even if it were not dicta, the court's reasoning is still quite limited. It only addresses whether Nemitz's cited amendments, statutes, and treaties *created* his right to own the property that he claimed—not whether a general right to own property in space exists.¹⁹³

III. *SLIPPING THE SURLY BONDS OF SOVEREIGNTY*

The preceding Parts have reviewed the history of discovery law on Earth and considered what principles might apply to resources in space. Acquiring celestial property may be as simple as making the first claim, or the United Nations may complicate the process by asserting sovereignty over space resources. Part III.A of this Note explains why UN sovereignty over celestial resources is inappropriate. This first subpart discusses the failure of the common heritage principle, the troubling implications of extraterrestrial sovereignty, and the distinction between environmental interests on Earth and in space. Part III.B shows how private space explorers can create a celestial mining industry without UN sovereignty. This portion of the Note points to aboriginal title as a precedent for establishing claims without a sovereign's authority, and discusses the benefits that a first-claimant regime could have for mankind as a whole, including developing nations.

A. *"Take Them"*

Someday, perhaps in 2025, a prospecting spacecraft will leave Earth on a mission to recover valuable resources from space.¹⁹⁴ As the prospector approaches its target, the United Nations or one of its subsidiaries may assert sovereignty over the target after deciding, with an eye toward the Moon Agreement, that resource exploitation in space is about to become

192. 21 C.J.S. *Courts* § 227 (2013) (describing dicta as reasoning not necessary to the decision of the case, which is generally not binding).

193. See *Nemitz*, 2004 WL 3167042 at *1-2 (holding that Nemitz had failed to establish that the Ninth and Tenth Amendment "provide" a claim for denial of property rights, that 42 U.S.C. § 2451 "establishe[d]" legal basis for his claim, and that the rejection of the Moon Agreement or the ratification of the Outer Space Treaty "created" any right to acquire property in an asteroid).

194. See BROPHY ET AL., *supra* note 11, at 5 (estimating that it will be possible to capture an asteroid by 2025).

feasible.¹⁹⁵ Such an assertion would call to mind the arrogance of Gregory Nemitz, pointing at a light in the sky and saying “That’s mine,” as someone else’s spacecraft struggled toward it.¹⁹⁶ Perhaps the United Nations will attempt to allocate regions of space to certain member states for exploration, just as the Papacy once assigned areas of the New World to European kingdoms.¹⁹⁷ If the first prospector acquires its target asteroid and collects its resources, the United Nations may attempt to capitalize on the prospector’s work, just as Nemitz demanded US\$0.20 per year from NASA for parking and storage of its probe.¹⁹⁸ The United Nations might try to establish an organization like the ISA or its planned-for “Enterprise,” and use prospectors’ technology, funds, and exploratory findings to acquire space resources for the United Nations itself.¹⁹⁹ For the reasons set forth below, the United Nations would lack sufficient basis in international law and public policy to support any of the actions described above.

The United Nations, or one of its subsidiaries, cannot establish that an asteroid and its resources are the common heritage of mankind because the “common heritage” principle is not a true international norm.²⁰⁰ The common heritage idea enjoys dubious authority under UNCLOS, and it has no standing in outer space after the failure of the Moon Agreement.²⁰¹ The common heritage principle, whatever it means, binds neither private space explorers nor the nations

195. See Moon Agreement, *supra* note 134, art. 11, para. 5 (requiring States Parties to establish a space-governance regime as soon as resource exploitation is about to become feasible).

196. See *Nemitz*, 2004 WL 3167042 at *1 (describing how Nemitz attempted to claim 433 Eros just before NASA’s probe reached it).

197. See *supra* notes 55–60 and accompanying text (describing how the Papacy asserted dominion over the entire world and granted certain monarchs the right to explore specified areas through instruments like the Bull Inter Caetera).

198. See *Nemitz*, 2004 WL 3167042 at *1 (describing how Nemitz demanded US\$0.20 per year for parking and storage of the NEAR Shoemaker probe).

199. See *supra* notes 93–95 and accompanying text (describing the ISA and Enterprise’s planned redistribution of resources under UNCLOS).

200. See *supra* note 88 (describing how only some developed nations acceded to UNCLOS, and only after the 1994 Protocol reduced the ISA’s power to distribute resources); *supra* notes 187–191 (describing how the Moon Agreement is not international law specifically because of objections to the common heritage problem).

201. See *supra* note 88 and accompanying text.

that host them, except perhaps the thirteen States Parties to the Moon Agreement.²⁰²

With the legal failure of the common heritage principle established, it is useful to examine the policy implications of extraterrestrial sovereignty. European monarchs and the Vatican asserted a similar power, extraterritorial sovereignty, over foreign lands on Earth in order to maintain peace among explorers, promote the spread of their values, and increase their wealth and power.²⁰³ The grave consequences of extraterritorial sovereignty throughout the Age of Exploration reveal the dangers of this concept.²⁰⁴ Through the Moon Agreement, the United Nations attempted to lay the foundation for its own extraterrestrial sovereignty over all asteroids, and every other celestial body in the solar system, even though no one on Earth had touched or even seen the majority of these objects.²⁰⁵ Extraterrestrial sovereignty is even more absurd because the Moon Agreement has failed, and the Outer Space Treaty, which enjoys more support, does not limit its own provisions to Earth's solar system.²⁰⁶ If the Outer Space Treaty is read to have established UN sovereignty in space, it would make that organization the master of all bodies outside of Earth's atmosphere.²⁰⁷ When one considers the vast multitude of celestial bodies in Earth's solar system, and further notes that there are probably more than one hundred billion stars in our galaxy, plus untold millions of other galaxies in the universe, such a claim is breathtakingly arrogant.²⁰⁸

202. *See supra* notes 184–88 and accompanying text (describing the few nations that have ratified the Moon Agreement).

203. *See supra* notes 53–59 and accompanying text (describing the causes and consequences of European extraterritorial sovereignty).

204. *See supra* notes 62–66 and accompanying text (describing the dangers of extraterritorial sovereignty).

205. *See NASA to Launch New Science Mission to Asteroid in 2016*, NASA (May 25, 2011), <http://www.nasa.gov/topics/solarsystem/features/osiris-rex.html> (describing the lack of human contact with asteroids); *see also supra* notes 134–45 and accompanying text (describing how the Moon Agreement attempted to establish UN control over space resources).

206. *See* Outer Space Treaty, *supra* note 118 (lacking language limiting its provisions to Earth's solar system).

207. *See id.*

208. *See How Many Stars Are There in the Universe?*, EUR. SPACE AGENCY (Feb. 23, 2004), http://www.esa.int/Our_Activities/Space_Science/How_many_stars_are_there_in_the_Universe [hereinafter ESA] (describing the estimated number of stars and

The United Nations may cite environmental reasons for exercising sovereignty in space, but environmental interests are not the same in space as they are on Earth. There is little if any support in law or policy for the preservation of asteroids' natural environments.²⁰⁹ An incident on July 19, 2009, reveals the difference between the environmental interest on Earth and in space.²¹⁰ That day, a large celestial body (between 80 and 160 kilometers in diameter) slammed into the surface of Jupiter at ninety-nine kilometers per second.²¹¹ This was an event of some significance for that asteroid or comet, which exploded in a fireball one thousand times more powerful than the asteroid explosion over Tunguska, Siberia, in 1908.²¹² The Tunguska blast drew immediate concern in countries as far away as England, where its shock wave rattled scientific instruments.²¹³ However, on the day after astronomers observed Jupiter's 2009 explosion, the *New York Times* led with an article about ESPN's efforts to corner the market on local sports stories.²¹⁴ Five days later, when the *Times* finally reported the celestial body's destruction, it pointed out Jupiter's useful role in Earth's solar system as a strong-gravity planet, which draws objects to crash into itself and thereby protects Earth from "space junk."²¹⁵ This "space junk" is exactly the sort of material that an

galaxies in the universe as of 2004); see also Andrew Moseman, *The Estimated Number of Stars in the Universe Just Tripled*, DISCOVER (Dec. 1, 2010), <http://blogs.discovermagazine.com/80beats/2010/12/01/the-estimated-number-of-stars-in-the-universe-just-tripled/#.UPx3XqFU6Ic> (summarizing the findings of a Yale astronomy study that indicated previous star population estimates were too low).

209. See *supra* notes 177–80 and accompanying text (describing the Outer Space Treaty's apparent assertion of jurisdiction over explorers rather than sovereignty over space resources in its environmental provisions).

210. See *Mystery Impact Leaves Earth-Size Mark on Jupiter*, CNN (July 21, 2009), <http://www.cnn.com/2009/TECH/space/07/21/jupiter.nasa.meteor.scar/index.htm>; see also *Hubble Space Telescope Captures Rare Jupiter Collision*, NASA (July 24, 2009), http://www.nasa.gov/mission_pages/hubble/main/jupiter-hubble.html (describing the impact on Jupiter).

211. See CNN, *supra* note 210; NASA, *supra* note 210.

212. See CNN, *supra* note 210; NASA, *supra* note 210.

213. See CNN, *supra* note 210; NASA, *supra* note 210.

214. See Brooks Barnes, *Across U.S., ESPN Aims to Be the Home Team*, N.Y. TIMES, Jul. 20 2009, at A1 (describing the sports network's attempts to appeal to local audiences).

215. See Dennis Overbye, *Jupiter: Our Cosmic Protector?*, N.Y. TIMES, Jul. 25, 2009, at WK7 (describing how Jupiter protects other planets from dangerous celestial bodies by drawing those objects to collide with itself).

environmental regime in space would attempt to preserve.²¹⁶ Left untouched by mankind, the only effect these bodies could have on Earth would be to eventually collide with this planet and kill large quantities of its life forms.²¹⁷

The distinction between environmental interests on Earth and in space also depends on the importance of sustainability. In a 2012 report, COPUOS expressed the view of some members that space resources should be developed in a “sustainable” manner.²¹⁸ Sustainability is a significant concern on Earth, where resources are finite.²¹⁹ Resources in outer space, however, comfortably exceed the practical reach of human consumption.²²⁰ For instance, a modest-sized metallic asteroid may contain more platinum group metals than have been mined on Earth in human history.²²¹ As noted above, there are far more than 500,000 asteroids of various types in this solar system alone.²²² Every gram of platinum, silicon, or water consumed in

216. *See, e.g.*, Moon Agreement *supra* note 134, art. 7 (providing for the preservation of environments in space).

217. *See generally* Peter Schulte et al., *The Chicxulub Asteroid Impact and Mass Extinction at the Cretaceous-Paleogene Boundary*, 327 *SCIENCE* 1214 (2010); Maureen Oakes, *Modeling an Asteroid Impact*, LOS ALAMOS NAT’L LAB., http://www.lanl.gov/quarterly/q_spring03/asteroid_text.shtml (last visited Mar. 29, 2013) (describing how the asteroid that struck Earth at what is now called the Chicxulub crater in Mexico probably caused the extinction of the dinosaurs as well as seventy percent of life on this planet).

218. Comm. on the Peaceful Uses of Outer Space, 55th Sess., GAOR 67th Sess., Supp. No. 20, 9 (June 15, 2012) (noting some members’ advocacy for sustainable development of the outer space environment and its resources).

219. *See, e.g.*, *Millennium Development Goals*, U.N. DEV. PROGRAM, <http://www.undp.org/content/undp/en/home/mdgoverview.html> (last viewed Mar. 29, 2013) (listing “[e]nsure environmental sustainability” as their eighth goal).

220. *How Big Is Our Universe?*, NASA, http://www.nasa.gov/audience/foreducators/5-8/features/F_How_Big_is_Our_Universe.html (last visited Mar. 5, 2013) (describing space objects 14 billion light years away from Earth).

221. *See* ROSS, *supra* note 4, at 6 (explaining that a modestly-sized (1 kilometer) metallic asteroid would probably contain more platinum group metals than are available on Earth).

222. *See* NASA, *Asteroids*, *supra* note 1 (asserting that there are more than 500,000 known asteroids in the solar system, and probably many more yet to be discovered); *see also* ESA, *supra* note 208 (describing hundreds of millions of stars in the Milky Way galaxy, and millions of galaxies in the universe).

space would leave untapped a more precious gram from Earth's limited resources.²²³

Even if international law were somehow construed to prohibit claims of private property over territory on celestial bodies, it would still not prohibit the acquisition and use of resources from those bodies.²²⁴ The first article of the Outer Space Treaty guarantees the right to use celestial bodies.²²⁵ Representatives of the United States and Soviet Union made uncontested statements at the time of the Treaty's passage that the term "use" includes the rights to acquire and possess resources from celestial bodies.²²⁶ As international law scholar (and aerospace engineer) Thomas Gangale put it, "If you want resources on Mars or the Moon, take them."²²⁷

B. *Escape Velocity*

The first asteroid prospectors will probably launch spacecraft from the territory of some nation on Earth.²²⁸ Just as persons and corporations on Earth are subject to the extraterritorial jurisdiction of their home governments when they engage in certain activities overseas, space prospectors will fall under the extraterrestrial jurisdiction of their launching states.²²⁹ When governments exercise extraterrestrial jurisdiction over their nationals in space, they can protect Earth and its

223. See Stewart B. Whitney, *Space Political Economy: Integrating Technology and Social Science for the 1990s*, Third Annual Space Development Conference (April 1990) (describing the environmental interest in developing space to preserve Earth).

224. See GANGALE, *supra* note 78, at 43 (arguing that individuals cannot acquire real property rights in space, but they may acquire and use space resources).

225. See Outer Space Treaty, *supra* note 118, art. I (guaranteeing the right to use celestial bodies).

226. See GANGALE, *supra* note 78, at 43.

227. See *id.*

228. Hypothetically, prospectors may also construct spacecraft in orbit, or they may use ocean launch-pads outside any nation's jurisdiction. See, e.g., *About Sea Launch*, SEA LAUNCH, <http://www.sea-launch.com/about.aspx> (last visited Dec. 11, 2012); *Sea Launch and Land Launch Projects*, ENERGIA, <http://www.energia.ru/en/launchers/launchers.html> (last visited Dec. 11, 2012) (describing a sea-based floating commercial launch pad).

229. See Outer Space Treaty, *supra* note 118, art. VIII (recognizing States Parties' jurisdiction over objects launched from their territories).

citizens from the negative impacts of asteroid mining.²³⁰ However, just as extraterritorial jurisdiction cannot justly extend a government's sovereign territory onto foreign lands, an Earth government's extraterrestrial jurisdiction cannot extend that government's sovereignty over space territory and resources.²³¹ Any Earth government, including the United Nations, may take measures within its authority to ensure that space prospectors not crash asteroids into Earth or poison this planet with alien microbes.²³² Earth governments may also intervene to prevent prospectors from harming each other.²³³ However, no government can declare any territory or resources in space to be under its dominion.²³⁴ Space prospectors may therefore acquire space territory and its resources as first claimants and continuous users.²³⁵ Just as aboriginal title allowed societies on Earth to assert ownership of the territory they used regardless of whether some government granted them title, the first prospectors can rightfully claim any resources they use without asking the United Nations for permission.²³⁶

230. *See, e.g.*, Outer Space Treaty, *supra* note 118, art. IX (requiring States Parties to avoid adversely affecting Earth's environment through the introduction of extraterrestrial material).

231. *See, e.g.*, *Banco Nacional de Cuba v. Sabbatino*, 376 U.S. 398, 400–01 (1964) (holding that extraterritorial jurisdiction does not grant US courts the authority to rule upon a foreign sovereign's public acts within that foreign sovereign's territory).

232. *See, e.g.*, Outer Space Treaty, *supra* note 118, art. IX (requiring States Parties to avoid adversely affecting Earth's environment through the introduction of extraterrestrial material).

233. *See, e.g.*, *United States v. Hasan*, 747 F. Supp. 2d 599, 606–07 (E.D. Va. 2010) (holding that states exercise jurisdiction over their nationals' conduct outside their territory through the "nationality principle," and also holding that states have criminal jurisdiction to proscribe conduct by foreign nationals occurring outside of their own territory if the conduct has a substantial effect within their territory under the "effects principle," or if the conduct is directed against a critical state interest under the "protective principle" (citing RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW OF THE UNITED STATES §§ 402(1)–(2) (1986); *Blackmer v. United States*, 284 U.S. 421, 437 (1932); *United States v. Yousef*, 327 F.3d 56, 110 (2d Cir. 2003)).

234. *See Zullo*, *supra* note 118, at 2419 (describing the "province of all mankind" language as meaning that space resources are subject to "the undivided and common use of all states on Earth . . . not joint [ownership] by them." (quoting U.S.S.R. Working Paper, *supra* note 171 at 24–25)); *see also* Report of the Legal Subcommittee, *supra* note 180 (refusing to adopt an Italian proposal that would prohibit the return of scientific samples).

235. *See supra* notes 49–52 and accompanying text (describing aboriginal title requirements).

236. *See supra* notes 49–52 and accompanying text.

Proponents of UN sovereignty in space are correct that property rights in the absence of sovereignty are less reassuring than property rights under sovereign protection.²³⁷ However, this does not mean that such property rights have no value at all. As stated above, a single asteroid could contain more platinum group metals than have ever been mined on Earth, and there are plenty of other precious resources on asteroids.²³⁸ Competing prospectors would have more than half a million asteroids from which to choose.²³⁹ In the event that two prospectors set their sights on the same exact asteroid, they would have to resolve their differences without resorting to the authority of an Earth government.²⁴⁰ Indigenous peoples all over the Pacific enjoyed their lands for millennia without European supervision, which should give us hope that the explorers and residents of space will manage their affairs without a Bureau of Extraterrestrial Land Management in Vienna.²⁴¹ Governments on Earth could discourage conflict by recording and publishing explorers' claims without recognizing them, just as the United Nations does in its *Law of the Sea Bulletin*.²⁴² Earth governments could also discourage conflicts by exercising extraterrestrial jurisdiction over victims and perpetrators of violence, just as nations currently exert authority over their citizens and those who would harm them in foreign lands or on the high seas.²⁴³ Ultimately, though, it will be up to the settlers of space to establish the customs and relationships that maintain order in

237. See GANGALE, *supra* note 78, at 33–34 (asserting that property without sovereignty is not practically useful without the protection of armed force).

238. See *supra* notes 6–11 and accompanying text (describing valuable resources in asteroids).

239. See NASA, *Asteroids*, *supra* note 1 (explaining that there are more than 500,000 known asteroids in Earth's solar system).

240. See *supra* notes 231–36 and accompanying text (explaining that Earth governments, including the United Nations, cannot extend their sovereignty to territory or resources in space).

241. See *supra* notes 41–45 and accompanying text (describing how Pacific Islanders settled their lands and established a right of ownership later recognized as aboriginal title).

242. See *supra* notes 104–06 and accompanying text (describing how the United Nations reduces the potential for conflict without recognizing deep seabed claims by publishing them in the *Law of the Sea Bulletin*).

243. See *supra* note 235 and accompanying text (describing how governments may use extraterritorial jurisdiction to prevent people in foreign territory from harming each other).

their interactions. When they do, they will become their own sovereigns.²⁴⁴

It is fitting that the beneficiaries of space commerce include societies that became their own sovereigns after exercising their rights under aboriginal title. To see how, this Note returns to the islands of the Kwajalein Atoll, where enterprising canoeists once made their homes on land that belonged to no person before.²⁴⁵ The first inhabitants of those lands, when they imagined the future, could not have predicted that they would fall subject to centuries of colonial rule, nor that they would emerge in the Twentieth Century as an independent nation called the Republic of the Marshall Islands.²⁴⁶ Whatever they thought about their future, those first pioneers could not have conceived what would happen in the Kwajalein Atoll on September 28, 2008.²⁴⁷ At 4:15 pm that day, a rocket blasted off a launch pad surrounded by sand, palm trees, and turquoise blue water.²⁴⁸ The rocket pushed a small spacecraft into the sky, and quickly lifted it past the one-hundred-kilometer altitude boundary between airspace and outer space.²⁴⁹ The spacecraft then separated from its first stage rocket, fired its second stage, and propelled itself into Earth's orbit, where it will likely remain until at least 2018.²⁵⁰ The spacecraft, known as SpaceX Corporation's Falcon 1 Flight 4, became the first privately built liquid fueled spacecraft to orbit the Earth.²⁵¹

As Kwajalein's example shows, private space activity can benefit developing nations in a manner that satisfies the spirit of the common heritage principal, if not the letter of the Moon Agreement. Small nations like the Republic of the Marshall Islands can provide commercial launch facilities for space

244. See BLACK'S LAW DICTIONARY 1195 (9th ed. 2009) (defining "sovereign" as "a person, body, or state vested with independent and supreme authority").

245. See Hezel, *supra* note 39, at 3 (describing the settlement of the Marshall Islands).

246. See Office of the President, Republic of the Marshall Islands, *supra* note 49 (describing the history of the Marshall Islands).

247. See *SpaceX Falcon 1 Flight 4, Mission Summary in Pictures*, SPACEX, <http://www.spacex.com/F1-004-summary.php> (last visited Mar. 29, 2013) (describing the Falcon 1 Flight 4 mission).

248. See *id.*

249. *Id.*

250. *Id.*

251. *Id.*

businesses.²⁵² The United Nations, while frustrated in its ambition to control the universe's bounty, should take solace in the knowledge that private enterprises can provide immediate benefits for nations that cannot yet build their own space vehicles.²⁵³

The Age of Exploration once again offers a useful analogy. Some of Earth's mightiest empires rose in small, resource-poor lands that provided good ports for commercial shipping.²⁵⁴ In the third millennium A.D., the proximity of many developing nations to Earth's equator makes them prime candidates for launch pads, because Earth's greater rotational speed at its central latitudes would assist spacecraft in reaching escape velocity.²⁵⁵ This accident of physics could give Somalia, Ecuador, and Papua New Guinea the kind of opportunities that Great Britain, the Netherlands, and Japan once enjoyed.²⁵⁶

As a would-be prospector, you might wonder whether the United States will support your business. That remains to be seen.²⁵⁷ Instead of concerning yourself with COPUOS proceedings in Vienna, you might lobby Congress for a Deep Space Hard Mineral Resources Act, similar to the Deep Seabed Hard Mineral Resources Act, which guarantees American

252. See Sea Launch, *supra* note 230 (describing a floating ship-based commercial launch pad that can bring commercial space activity to any nation that wishes to host it).

253. *Id.*

254. See, e.g., SIR WILLIAM TEMPLE, OBSERVATIONS UPON THE UNITED PROVINCES OF THE NETHERLANDS 210–11 (1705) (“Nor has *Holland* grown rich by any Native Commodities, but by force of Indu[s]try; by Improvement and Manufacture of all Foreign Growths; and by being the general Magazine of *Europe*, and furni[s]hing all Parts with whatever the Market wants or invites; and by their Sea-men, being, as they have properly been call’d, the common Carriers of the World.”); ADAM ANDERSON, I AN HISTORICAL AND CHRONOLOGICAL DEDUCTION OF THE ORIGINS OF COMMERCE preface, v (1763) (“To the instrumentality of commerce alone, the Britannic Empire is, mo[s]t peculiarly, indebted for its opulence and grandeur; its improvement in arts and knowledge; and, in general, for the great bulk of its [s]olid comforts and conveniences.”).

255. *A Saturn Launch Site*, NASA, <http://www.hq.nasa.gov/pao/History/SP-4204/ch1-2.html> (last visited Mar. 29, 2013) (describing how early NASA launch planners sought to take advantage of equatorial launch sites because of the Earth's faster rotational velocity at the equator).

256. THE NEW INTERNATIONAL ATLAS 2 (Rand McNally 1994 ed. 1969) (depicting Somalia, Ecuador, and Papua New Guinea as nations lying on or near Earth's equator).

257. See *supra* notes 192–94 and accompanying text (describing varying US actions regarding property rights in space).

companies' right to acquire deep seabed resources.²⁵⁸ If Congress is not interested, you might take your business to a nation like Russia, whose law explicitly recognizes the property rights of space explorers.²⁵⁹

CONCLUSION

Governments on Earth, like the European monarchs who sponsored ancient conquests, monopolized space exploration until very recently.²⁶⁰ As opportunities for space travel grow and multiply through private industry, and as people and enterprises move into space in greater numbers and at greater distances, the residents of space will constitute wholly new societies, with their own interests, communication, and culture.²⁶¹ Earth's authorities should expect that as these pioneers develop the ability to support and govern themselves, they will grow restless of the political bonds which connected them with their old world.²⁶² When that day comes, the governments of Earth will find that this planet has no more right to those celestial bodies than the

258. See Deep Seabed Hard Minerals Resources Act, 30 U.S.C. §§ 1401–1473 (2012).

259. See Russian Federation, 1993, Law of the Russian Federation on Space Activity (June 20, 1993), art. 16 para. 4, available at http://www.jaxa.jp/library/space_law/chapter_4/4-1-2-7/4-1-2-73_e.html (“The property rights over the physical product created in outer space shall belong to the organizations and citizens possessing property rights in the components of space technics”).

260. Will Oremus, *Deep Space Mine*, SLATE (May 11, 2012), http://www.slate.com/articles/technology/future_tense/2012/05/asteroid_mining_the_crazy_awesome_plan_to_grab_platinum_from_outer_space_.html (describing how the first participants in the “space race” were governments, particularly the United States and what is now Russia).

261. See, generally JOSHUA KENDALL, *THE FORGOTTEN FOUNDING FATHER: NOAH WEBSTER'S OBSESSION AND THE CREATION OF AN AMERICAN CULTURE* (2011) (describing how America's unique culture and status as a independent polity arose in part from its development of unique means of communication).

262. See, e.g., Carlton F.W. Larson, *The Declaration of Independence: A 225th Anniversary Re-Interpretation*, 76 WASH. L. REV. 701, 728–37 (2001) (noting the conspicuous repetition of “We” in the Declaration of Independence, and concluding that the Declaration symbolized the existence of a single American people as distinct from Britain, which the former colonists now considered an alien nation); PETER AUGUSTINE LAWLER, *ALEXIS DE TOCQUEVILLE ON THE ORIGIN AND PERPETUATION OF HUMAN LIBERTY* 14 (1993) (describing one of Tocqueville's most celebrated contributions to political science as the “revolution of rising expectations”).

monarchs of Europe could claim over Kwajalein.²⁶³ It will then be clear, if it is not already, that those celestial bodies are not the common heritage of people in Vienna, New York, or Moscow.²⁶⁴ Those territories will be the common heritage of the people who live there, the descendants of those who claimed lands that belonged to no one before.²⁶⁵ It will be time to let them go, so that they can assume among the powers of the universe a separate and equal station.²⁶⁶

The rest is just rocket science.

263. *See supra* notes 62–66 and accompanying text (describing the disastrous effects of extraterritorial sovereignty). It might seem bizarre in modern times to expect that extraterrestrial sovereignty would bring back old colonial evils like mercantilism and the Spanish Inquisition. *See* GANGALE, *supra* note 78, at 113 (arguing that opponents of the Moon Agreement are wrong to block its ratification due to some “trepidation over the shape of things to come”). *But see supra* notes 90–93 and accompanying text (describing how the drafters of UNCLOS attempted to create the Enterprise, a neo-mercantilist UN mining company). *See generally* MONTY PYTHON’S FLYING CIRCUS: *The Spanish Inquisition* (BBC television broadcast Sep. 22, 1970) (“Nobody expects the Spanish Inquisition.”).

264. *See supra* notes 187–91 and accompanying text (describing the failure of the Moon Agreement and its common heritage principle).

265. *See supra* notes 230–37 and accompanying text (describing how asteroid prospectors can claim celestial bodies in accordance with the principle of aboriginal title).

266. *See* THE DECLARATION OF INDEPENDENCE pmbl. (U.S. 1776).