

**BOLDLY GOING WHERE NO REALTOR HAS GONE BEFORE:
THE LAW OF OUTER SPACE AND A PROPOSAL FOR A NEW
INTERPLANETARY PROPERTY LAW SYSTEM**

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ABSTRACT

This comment is a review of the current body of law regarding outer space; more specifically, it analyzes the property rights that exist for states, corporations, and individuals on the moon, the planets, and the space between them. This article proposes that existing international space law is stifling the human exploration and development of outer space and that U.S. common law property law can be a constructive inspiration for a new property law for outer space.

Surely the opening vistas of space promise high costs and hardships, as well as high reward . . . on the most hazardous and dangerous and greatest adventure on which man has ever embarked.

—President John F. Kennedy, 1962

Attempts to develop and establish legal rules governing a vast and extremely complex subject matter like space exploration are rather like trying to hack down Mount Everest with a blunt kitchen knife.

—Adrian Bueckling, 1979

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INTRODUCTION

In early 2010, President Barack Obama submitted a budget proposal to Congress that would require NASA to cancel the Constellation program that was to return humans to the moon, and which would instead focus on the development of new space technologies.¹ The President's proposal would end aspirations to return astronauts to the moon by 2020—a key component of President George W. Bush's "vision for space exploration" developed in the aftermath of the destruction of the space shuttle *Columbia* in 2003.² In its place, the President's proposal offers nothing in terms of human exploration of the solar system.³ What the Obama Administration calls a "bold new initiative" does not identify a next destination nor does it provide a timetable for getting there.⁴ Indeed, if Obama's budget proposals are approved, NASA would no longer necessarily operate its own spacecraft but rather "buy tickets" for its astronauts' ventures into outer space.⁵ Congress authorized President Obama's proposal in late September 2010, although the bill that Congress passed retained some deep space exploration elements of the Constellation program that the Administration's plan would have eliminated outright.⁶ While the trend away from publicly financed manned spaceflight could significantly decrease the role of government in space exploration, it could also add fuel to the burgeoning commercial space industry.⁷

The trend away from state-sponsored space exploration to commercially-based private space entrepreneurship is nothing new.⁸ State-sponsored manned exploration of space has faltered due to declining revenues, vacuous political will, and fleeting taxpayer patience for national cosmic quests.⁹ At the same time, enterprising private space

¹ Kenneth Chang, *Obama Calls for End to NASA's Moon Program*, NYTIMES.COM (Feb. 1, 2010), <http://www.nytimes.com/2010/02/02/science/02nasa.html>.

² *Id.*

³ *Id.*

⁴ *Id.*

⁵ *Id.*

⁶ Kenneth Chang, *NASA Gets New Orders That Bypass the Moon*, N.Y. TIMES, Oct. 30, 2010 at A16.

⁷ *Id.*

⁸ See generally Brandon C. Gruner, Comment, *A New Hope for International Space Law: Incorporating Nineteenth Century First Possession Principles into the 1967 Space Treaty for the Colonization of Outer Space in the Twenty-First Century*, 35 SETON HALL L. REV. 299, 317–18 (2004).

⁹ See *id.*

entrepreneurs and industries are eager to fill the vacuum left by state-sponsored space industries, but they are constrained in their pursuits by a space law regime that was constructed in the midst of the Cold War and that seems to almost completely forbid any semblance of private property in outer space.¹⁰ Lynn Fountain notes that the current space legal regime “appears to be antithetical to the commercial development of outer space.”¹¹ Fountain explains that “[w]ithout the security derived from ownership and sovereign control, entities that might be interested in the development of space resources will be reluctant to undertake [the] expensive and risky path” implicit in all space travel.¹²

Space technologies, research, and industries are booming, but this comment argues that they lack the legal and political framework needed to fully develop their enterprises. Private engineers are building the next generation of spaceflight vehicles, such as Burt Rutan and Richard Branson’s *SpaceShipOne* and *SpaceShipTwo*, and recent discoveries of water on the moon and Mars open new possibilities for human habitation and colonization.¹³ Additionally, asteroids contain some of the oldest materials in the solar system, and the minerals and metals of which they are made can provide promising opportunities for human mining and resource extraction.¹⁴ By transferring resource extraction to outer space, humans can minimize and perhaps eliminate the need for the same destructive activity on Earth.¹⁵ In this manner, the

¹⁰ See generally Lynn M. Fountain, Note, *Creating Momentum in Space: Ending the Paralysis Produced by the “Common Heritage of Mankind” Doctrine*, 35 CONN. L. REV. 1753, 1754 (2003).

¹¹ *Id.* at 1764.

¹² *Id.*

¹³ See generally Bill McGee, *Space Travel is Ready for Booking*, USA TODAY TRAVEL BLOG (Feb. 24, 2010, 2:22 PM), http://www.usatoday.com/travel/columnist/mcgee/2010-02-24-space-travel_N.htm; see also Buzz Aldrin, Op-Ed, *Trading the Moon for Mars*, WALL ST. J. ONLINE (Feb. 25, 2010, 10:44 PM) <http://online.wsj.com> (search for title); *NASA Finds “Significant” Water on Moon*, CNN.COM (Nov. 13, 2009, 7:16 PM), <http://www.cnn.com/2009/TECH/space/11/13/water.moon.nasa/index.html>. Additionally, SpaceX’s *Falcon 9* rocket completed the first successful launch of a commercial space rocket on December 8th, 2010, an accomplishment that provided increased momentum to the developing NASA-private industry space exploration partnership. Kenneth Chang, *Private Spacecraft Returns from Orbit for First Time*, N.Y. TIMES, Dec. 9, 2010 at A27.

¹⁴ Mike Sonter, *Asteroid Mining: Key to the Space Economy*, SPACE.COM (Feb. 9, 2006, 6:51 AM), http://www.space.com/adastra/060209_adastra_mining.html.

¹⁵ Michael Gilbrook, Op-Ed, *To the Moon and Mars: Why We Have to Go*, ORLANDO SENTINEL, Jan. 15, 2004, available at http://articles.orlandosentinel.com/2004-01-15/news/0401150137_1_asteroid-moon-solar-power.

development and extraction of outer space resources can give birth to a significant environmental renewal on Earth.

The promise and potential of robust human exploration of outer space was summed up succinctly by Stewart B. Whitney, the man slated to be the third “teacher in space” at the time of the *Challenger* space shuttle disaster:

Space industrialization promises to alleviate many of [E]arth’s problems and to help solve the calamity of despoiled habitation on this planet. It is a new growth area to stabilize the business environment, to stimulate investment, and to help fashion a new political economy. The manufacture and utilization of resources located off [E]arth for the benefit of new and improved products, services, and sources of energy for [E]arth will profit those who possess the imagination and resources to exploit this new frontier. Economic self-interest and public good will generate investment in space industrialization to produce huge dividends including financial returns, scientific knowledge, development of new industry and products, an alternative solution to world problems of resource depletion, environmental pollution, and additional habitat space.¹⁶

Finally, the natural human tendency to explore uncharted frontiers demands a human return to space. Since the last human walked on the moon in 1972, NASA and other space agencies have focused on projects confined to Earth’s orbit, such as the International Space Station, and on robotic scientific missions to the planets and comets.¹⁷ While the scientific and technological benefits of such endeavors should not be readily discarded, these projects lack the essential human element that so inspired the *Apollo* generation. Robots and probes provide scientists with invaluable raw data on the composition of the universe and its planets, but only human beings can experience and communicate the awe that accompanies leaving our earthly nursery to sail upon the cosmic seas.

¹⁶ THOMAS GANGALE, *THE DEVELOPMENT OF OUTER SPACE: SOVEREIGNTY AND PROPERTY RIGHTS IN INTERNATIONAL SPACE LAW* 1–2 (2009) (citing Stewart Whitney, *Space Political Economy: Integrating Technology and Social Science for the 1990s*, Third Annual Space Development Conference (April 1984)).

¹⁷ Kenneth Chang, *NASA to Review Plans for Human Spaceflight*, N.Y. TIMES, Jan. 27, 2010, at A14.

Not only does *human* exploration of space inspire generations of scientists and explorers, but it can also enlarge the human experience by transforming our conception of our universe and our unique place within it. As Thomas Gangale, a leading expert on space studies and aerospace engineering, has eloquently explained, “[e]ven if spacefaring were not a matter of survival, we would still need to go into space, because the answers to our very existence are out there, and curiosity is one of the strongest of human traits. Where did we come from? How did we get here? Who else is out there?”¹⁸

This comment suggests that a new property law regime, modeled after U.S. common law property principles, can open outer space to private ventures while retaining the best aspects of the common sovereignty philosophy at the heart of current space law. Although this argument concedes that exclusive possession of any portion of space, the planets, and other celestial bodies is both inconceivable under space law and undesirable, it argues that a system of leaseholds, licenses, reversionary interests, easements, and covenants are ideal for a newly configured space law regime. A system incorporating these property interests can open outer space to both public and private explorers while retaining international joint sovereignty of space. In summation, this new property law regime can ignite the next bold era of human space exploration.

Part I reviews and summarizes the evolution of the law of outer space from its Cold War origins. Part II examines existing space law treaties. Part III reviews current legal models governing other areas of the global commons and explores whether any of these existing regimes are constructive inspirations for a new outer space property regime. Finally, Part IV proposes a new property law system, modeled after U.S. common-law property principles. This system will attempt to retain the “common heritage” language and concept of the original treaties while introducing property concepts like leaseholds, licenses, reversionary interests, easements, and covenants into the space law regime. Thus, this new space property law system can open up the cosmos to the ingenuity and intuition of those private entrepreneurs who will be the architects of the next space age.

¹⁸ GANGALE, *supra* note 16, at 257.

I. BACKGROUND

A. COLD WAR ORIGINS

The existing space law regime is the product of the Cold War era, when the United States and the Soviet Union were engaged in a prolonged ideological, economic, and technological showdown.¹⁹ Indeed, the space programs in both the United States and the Soviet Union were designed with the belief that the exploration of the cosmos was a competition whose victor would enjoy considerable political prestige back on Earth.²⁰ This paradigm motivated the United States and the Soviet Union to invest their space programs with the generous budgets of a war economy without developing a cost-benefit analysis regime to account for such expenditures.²¹ In order to create a space law regime during this time of heightened geopolitical tensions, a fragile consensus between the already-divided superpowers had to be forged.²² This consensus encompassed the principles that states engage in only peaceful, non-colonial uses of outer space, and that the province of outer space would be open to exploration and use by all states in the global community.²³

The 1963 United Nations (UN) General Assembly Declaration of Legal Principles Governing Activities in Outer Space (“Declaration”) summarized the components of this hard-won consensus, explaining that space exploration was to be for the “benefit of all humankind.”²⁴ States are responsible for their activities in outer space, and such activities should be undertaken in cooperation and mutual assistance.²⁵ States launching objects into the cosmos retain their sovereignty over such objects, and they may be liable for any damages caused by these objects in outer space or on Earth.²⁶ Finally, under the Declaration astronauts are

¹⁹ *See id.* at 1.

²⁰ JULIAN HERMIDA, LEGAL BASIS FOR A NATIONAL SPACE LEGISLATION xv (2004).

²¹ *Id.*

²² *See* Heidi Keefe, Essay, *Making the Final Frontier Feasible: A Critical Look at the Current Body of Outer Space Law*, 11 SANTA CLARA COMPUTER & HIGH TECH. L.J. 345, 345–46 (1995).

²³ *Id.*

²⁴ GERHARD VON GLAHN & JAMES L. TAULBEE, LAW AMONG NATIONS: AN INTRODUCTION TO PUBLIC INTERNATIONAL LAW 397 (8th ed. 2007).

²⁵ *Id.*

²⁶ *Id.*

considered “envoys of mankind” to whom assistance would be rendered in the event of a crisis.²⁷ The Declaration manages both to promote exploitation of Outer Space and simultaneously to seek international cooperation for such ventures.²⁸ The outer space treaties enacted in the subsequent years retain these principles as their guides.

B. SPACE EXPLORATION SINCE THE COLD WAR

State-run space exploration and development experienced a steady decline following the Cold War.²⁹ As the Cold War impetus for the colonization of space ended and the tax-paying public lost their appetite for expensive space budgets, state-sponsored space projects began shrinking in size and scope.³⁰ In this manner, a new outer space property law regime can reinvigorate the human exploration of outer space by creating incentives for *private* corporations and entrepreneurs to develop space, while reducing the likelihood that space projects will be doomed for lack of political will or reluctance to spend taxpayer money on such ventures.

Some commentators have suggested that NASA and other space agencies began an agonizingly slow death on July 20, 1969, the day that *Apollo 11* landed on the Moon.³¹ These writers suggest that after the United States won the moon race against the Soviet Union, Congress could no longer justify the expenses that accompanied the manned space program.³² Tom Wolfe suggests that Congress saw approximately \$150 billion of expenditures in NASA’s budget that could be better spent on Earth-bound “pork-barrel” projects.³³ For decades after the moon landing, and after the *Apollo* program was dismantled, the human spaceflight program was relegated to space shuttle flights in low Earth orbit.³⁴ While NASA is not the only state space agency on Earth, at the moment it seems that it is the only agency that could seriously undertake

²⁷ *Id.*

²⁸ S. BHATT, INTERNATIONAL AVIATION AND OUTER SPACE LAW AND RELATIONS: REFLECTIONS ON FUTURE TRENDS 105 (1996).

²⁹ Traci Watson, *NASA at Mission “Crossroads” after 50 years; Agency Set to Take Break from Launching Manned Craft*, USA TODAY, Sept. 29, 2008, at 4A; *see also* Evan S. Benn, *NASA Marks a Melancholy 50th Anniversary*, MIAMI HERALD, Sept. 30, 2008.

³⁰ *See generally* Gruner, *supra* note 8, at 317–18.

³¹ Tom Wolfe, Op-Ed., *One Giant Leap to Nowhere*, N.Y. TIMES, July 19, 2009, at WK11.

³² *Id.*

³³ *Id.*

³⁴ Editorial, *The Moon Landing*, N.Y. TIMES, July 18, 2009, at A20.

the grand manned space expeditions that characterized the *Apollo* era.³⁵ Although some Chinese and Russian officials have talked about establishing a moon base around 2025, neither of these countries have made any official pronouncements, and their current space technologies are inadequate for completing the task.³⁶

In January 2004, President George W. Bush announced a new U.S. space policy.³⁷ This policy promised to return Americans to the moon, which would serve as a base for human exploration of the planets and other celestial bodies.³⁸ This policy envisioned partnerships between NASA, other space agencies in the world community, and the private sector.³⁹ However, the policy failed to lift off because the necessary funds were never appropriated: although the new program was to receive \$108 billion for 2006 through 2020 under President Bush's policy proposal, President Bush never formally requested such financing, and Congress never appropriated the funds.⁴⁰

At the beginning of his administration, President Obama convened a panel consisting of experienced leaders in spaceflight and related fields to reevaluate the goals of U.S. space policy.⁴¹ Specifically, President Obama tasked the panel with deciding whether to scuttle the next-generation rockets that NASA was in the process of developing for the return to the moon, or instead to affirm NASA's direction.⁴² One member of the panel, former astronaut Dr. Sally Ride, explained that she was looking for proof that a human exploration program could be undertaken under NASA's current budget.⁴³

Shortly after the panel began its deliberations, it confronted the very terrestrial realities that would accompany any state-run mission to return to the moon or explore Mars. In a blistering report delivered to

³⁵ Kenneth Chang, *Grand Plans for Moon and Mars, Budget Permitting*, N.Y. TIMES, July 14, 2009, at D2.

³⁶ *Id.*

³⁷ David E. Sanger & Richard W. Stevenson, *Bush Backs Goal of Flight to Moon to Establish Base*, N.Y. TIMES, Jan. 15, 2004, at A1.

³⁸ P.J. Blount, *The ITAR Treaty and its Implications for U.S. Space Exploration Policy and the Commercial Space Industry*, 73 J. AIR L. & COM. 705, 705 (2008).

³⁹ *Id.*

⁴⁰ Kenneth Chang, *Panel Wants Deep Space, Not Landings as U.S. Goal*, N.Y. TIMES, July 31, 2009, at A16.

⁴¹ Kenneth Chang, *New Panel Will Review NASA's Shift in Spaceflight*, N.Y. TIMES, May 8, 2009, at A18.

⁴² *Id.*

⁴³ Dennis Overbye, *NASA Panel Grapples with Cost of Space Plans*, N.Y. TIMES, Aug. 13, 2009, at A20.

President Obama in early September 2009, the panel concluded that the “U.S. human spaceflight program appears to be on an unsustainable trajectory” and that the new space policy was guilty of “perpetuating the perilous practice of pursuing goals that do not match allocated resources.”⁴⁴ The panel also explained that space exploration has become a worldwide enterprise, and the combined annual budgets of all the foreign state-run space programs are comparable to NASA’s budget alone.⁴⁵ The panel emphasized that actively engaging with the international community in the realm of space exploration could “strengthen geopolitical relationships, leverage global resources, and enhance the exploration enterprise.”⁴⁶ More interestingly, the panel noted that there is an exploding commercial space industry, and, by collaborating with private entrepreneurs, government expenditures could be reduced.⁴⁷

President Obama seemed to take the recommendations of the U.S. Human Space Flight Plans Committee to heart. The Administration’s budget proposals for NASA, unveiled February 1st, 2010, included plans to cancel the *Ares I* rocket that would have replaced the space shuttles.⁴⁸ The *Orion* capsule, which would send humans beyond low-Earth orbit for the first time since 1972, would also be scrapped.⁴⁹ The Obama proposal effectively means that new missions to leave Earth’s orbit will be placed on hold for at least a few years, and that future space exploration would involve more multinational cooperative efforts akin to the International Space Station rather than those like the NASA-driven, U.S.-centric *Apollo* moon landings.⁵⁰ However, the President’s budget would also allocate \$6 billion for financing “space taxis” developed by private commercial companies such as Elon Musk’s SpaceX and Boeing and Lockheed Martin’s United Launch Alliance.⁵¹ While the ambitions of human spaceflight have been stymied by budgetary restraints, shallow political will, and declining

⁴⁴ U.S. HUMAN SPACE FLIGHT PLANS COMMITTEE, SUMMARY REPORT 1 (2009).

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ Kenneth Chang, *Billions for NASA, With a Push to Find New Ways Into Space*, N.Y. TIMES, Feb. 2, 2010 at A16.

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ *Id.*

taxpayer enthusiasm, the emerging commercial space industry has the potential to reinvigorate the dream of human exploration of outer space.

C. THE COMMERCIAL SPACE INDUSTRY

Private businesses are eager to develop space-faring technologies and exploit the minerals and substances abundant on the Moon and on other celestial bodies.⁵² The launch of the spacecraft *SpaceShipOne* is demonstrative of the advancement of private space enterprises. *SpaceShipOne* succeeded in flying a passenger spacecraft up into low orbit and flying back to Earth twice within one week.⁵³ Private ingenuity and resources are fueling the next age of space exploration.

Indeed, private sector spending on space applications has exceeded government spending in the same area since 1998.⁵⁴ The apparent reason for this explosion in space investment is that private space ventures promise great profits should they be realized: such ventures include space hotels (profits estimated at \$5 billion a year by 2015), contracting with NASA to send humans to Mars (profits at \$400 billion by 2030), orbital labs for the development of microchips and biotech devices (profits at \$10 billion by 2015), solar satellites and electricity (\$100 billion by 2020), a space elevator that aims to replace rockets (\$2 billion by 2021), asteroid mineral mining (\$10 billion by 2030), lunar mining (\$354 billion by 2050), and, of course, space tourism (\$1 billion by 2023).⁵⁵ Clearly, private industry has economic incentives motivating it to invest in space exploration and technologies.

Commentators note that private investment in space exploration is not saddled with the same inherent challenges burdening state-funded space programs.⁵⁶ Unlike governments, private companies are not held hostage to public opinion, political pressure, and limited tax dollars.⁵⁷

⁵² Fountain, *supra* note 10, at 1754.

⁵³ John Schwartz, *Private Rocket Ship Earns \$10 Million in New Space Race*, N.Y. TIMES, Oct. 5, 2004, at A1.

⁵⁴ Chris Taylor, *Profits Set to Soar in Outer Space*, CNNMONEY.COM (Feb. 27, 2006, 3:39 PM), http://money.cnn.com/2006/02/27/technology/business2_guidetospaceintro/.

⁵⁵ *Out of This World*, CNNMONEY.COM (Feb. 16, 2006, 11:07 PM), http://money.cnn.com/magazines/business2/business2_archive/2006/03/01/8370590/index.htm. These figures are almost certainly overly optimistic. However, they are indicative of the profit potential that space development promises.

⁵⁶ John Adolph, Comment, *The Recent Boom in Private Space Development and the Necessity of an International Framework Embracing Private Property Rights to Encourage Investment*, 40 INT'L LAW. 961, 974 (2006).

⁵⁷ *Id.*

Private companies suffering mission or technology failures can rebound more quickly than can state space agencies, and shareholder-driven investment in space industries can promote market innovation by rewarding successful companies with favorable stock market returns.⁵⁸

Despite all this interest in space, current space law constrains the private space industry. The industry is confused as to the current law's scope and is apprehensive about its provisions forbidding any possessory rights of outer space or celestial bodies.⁵⁹ These businesses want to be sure that the technology, funding, and efforts they put toward the development of space will be rewarded. Thus, a properly crafted property law regime, unique to outer space, must be developed to ensure that private space industry continues to invest in cosmic ventures and technologies. If private companies are going to spend billions of dollars developing commercial and exploratory expeditions to outer space, they should do so knowing that they will be entitled to reap most of the benefits garnered from such missions. To insist otherwise would be to kill commercial space industry in its infancy and relegate space exploration to the rudderless direction it has followed since the end of the Apollo era.

II. THE EXISTING SPACE LAW REGIME

Five main UN treaties govern the exploration and exploitation of outer space. Products of the Cold War era, these documents reflect the belief of a former global community that outer space should remain a place enshrined as a "Common Heritage of Mankind" that would not be subject to national appropriation or militaristic endeavors.⁶⁰

A. THE OUTER SPACE TREATY OF 1967

The 1967 Outer Space Treaty is the foundation of all space law. U.S. President Lyndon Johnson spearheaded the Outer Space Treaty, seeking a U.N. agreement to prevent any state from claiming legal or other title to the moon or other celestial bodies.⁶¹ The aim of the treaty was thus to ensure that outer space would never be colonized or

⁵⁸ *Id.*

⁵⁹ Fountain, *supra* note 10, at 1774.

⁶⁰ Keefe, *supra* note 22, at 345-46.

⁶¹ VON GLAHN & TAULBEE, *supra* note 24, at 397.

privatized to the exclusion of any party.⁶² The Treaty entered into force on October 10, 1967, after it was ratified by the U.S. Senate.⁶³ To date, the Treaty has been signed by approximately 120 countries.⁶⁴ In spite of, or perhaps because of, its widespread support, the Treaty represents little more than a set of principles, which, in the absence of any enforcement mechanisms, are reduced to a collection of “self-denying” statements.⁶⁵ For instance, article I of the Outer Space Treaty states: “The exploration of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic and scientific development, and shall be the province of all mankind.”⁶⁶ Furthermore, article II provides that “outer space, including the moon and other celestial objects, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.”⁶⁷ While article I’s “province of mankind” proclamations and article II’s non-appropriations restrictions would seem to completely prevent “possession” of outer space or celestial territory, there are nonetheless debates within the international law community about the enforcement of these articles.

Some argue that the treaty bans only sovereign claims to celestial bodies, not individual claims.⁶⁸ Under this view, nations and governments are prohibited from possessing property rights on celestial bodies, but individuals are not. Theoretically, any enterprising *individual* could claim lunar realty under this narrow interpretation of the treaty. One such individual is a Californian, Dennis Hope, who is the founder of the “Lunar Embassy.” After registering a “Declaration of Ownership” for possession of the moon in the San Francisco county offices, Hope pronounced himself as the “Head Cheese” of the lunar surface and the eight remaining planets and their moons.⁶⁹ Hope iterated that all transactions regarding real estate planning, property and resource

⁶² Keefe, *supra* note 22, at 349–50.

⁶³ VON GLAHN & TAULBEE, *supra* note 24, at 397.

⁶⁴ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, *opened for signature* Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

⁶⁵ VON GLAHN & TAULBEE, *supra* note 24, 397.

⁶⁶ Outer Space Treaty, *supra* note 64, art. 1.

⁶⁷ *Id.* art. 2.

⁶⁸ Rosanna Sattler, *Transporting a Legal System for Property Rights: From the Earth to the Stars*, 6 CHI. J. INT’L L. 23, 28 (2005).

⁶⁹ VIRGILIU POP, WHO OWNS THE MOON? EXTRATERRESTRIAL ASPECTS OF LAND AND MINERAL RESOURCES OWNERSHIP 9–10 (2009).

development, and other exploration of the moon could be done only subject to his advice and consent.⁷⁰ Hope then proceeded to send copies of his “Declaration of Ownership” and company registration for the Lunar Embassy to the governments of the United States, the Soviet Union, and the UN General Assembly as a “courtesy,” explaining that he was planning to sell the lunar surface in plots.⁷¹ Hope also included a bill for \$55,000.00 for littering and storage on his lunar property.⁷²

Although Hope’s bill and Declaration were completely ignored by the United Nations, the United States, and the Soviet Union, his business boomed. He sold 3,500 “properties” in the first sixteen years of the Lunar Embassy, and since 1998 he has managed a two-tier “reselling” program, whereby current owners of Hope’s lunar property could, in turn, sell their properties to other buyers.⁷³ In December 2005, there were twenty-seven reselling agents in the United States, and his “Ambassadorship” program has representatives in fifteen countries.⁷⁴ While the international community has thus far ignored Hope, the proliferation of copycat companies selling lunar realty symbolizes the persistent enthusiasm that space ownership holds for thousands of people.⁷⁵ If the international community is ever going to colonize the moon and other celestial bodies, it must have a property law regime that allows it to somehow deal with the thousands of claims now staked to the lunar surface by individuals like Dennis Hope.

Others assert that the meaning of the Outer Space Treaty is explicit—it bans property rights on celestial bodies by national claims of sovereignty or by any other means.⁷⁶ Proponents of this broad view of the Treaty see its precepts clearly: no single state, individual, or other private entity can occupy and develop outer space without the consent of the international community.⁷⁷

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ GANGALE, *supra* note 16, at 35–39.

⁷⁷ Sattler, *supra* note 68, at 28.

B. THE MOON AGREEMENT OF 1979

The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (“Moon Treaty”) is a controversial treaty and has been ratified only by a small number of states.⁷⁸ The Moon Treaty allows “State Parties . . . in the course of scientific investigations [to] use mineral and other substances of the moon in quantities appropriate for the support of their missions.”⁷⁹ The Moon Treaty allows states to build lunar stations and retain sovereignty and control over these stations.⁸⁰ However, article 11 of the Moon Treaty proclaims that “[t]he moon and its natural resources are the common heritage of mankind . . . not subject to national appropriation.”⁸¹ The Moon Treaty continues, providing that “[n]either the surface nor the subsurface of the moon, nor any part of the natural resources in place, shall become the property [of anyone].”⁸² These provisions seem to echo the non-possessory principles of the Outer Space Treaty, adding heft to the arguments of those who claim that space law forbids *any* private ownership of outer space. Furthermore, the Moon Treaty provides that any resources extracted from celestial bodies will be governed by an international regime tasked with managing these resources and distributing them equitably amongst all parties to the Moon Treaty.⁸³ Given that most nations have not signed or ratified the Moon Treaty, particularly most of the space-faring nations, the continuing effectiveness of the Moon Treaty is in doubt.⁸⁴

Indeed, some suggest that the waning efforts at human space flight contributed to the apparent failure of the Moon Treaty. Thomas Gangale explains that by the time the Moon Agreement was being drafted, “the United States had already slammed the door on a sustained, manned lunar exploration program Plans for an American-manned landing on Mars in the early 1980s had also been dropped.”⁸⁵ Gangale continues, explaining that by 1979, the year that the Moon Agreement

⁷⁸ United Nations Office for Outer Space Affairs, Status of International Agreements Relating to Activities in Outer Space as at 1 January 2008, Addendum 3, U.N. Doc. ST/SPACE/11/Rev.2/Add.1 (Jan. 1, 2008) [hereinafter Status of International Agreements].

⁷⁹ Agreement Governing the Activities of States on the Moon and Other Celestial Bodies art. 6, Dec. 5, 1979, 18 I.L.M. 1434 [hereinafter Moon Treaty or Moon Agreement].

⁸⁰ *Id.* art. 12.

⁸¹ *Id.* art. 11.

⁸² *Id.*

⁸³ *Id.*

⁸⁴ Status of International Agreements, *supra* note 78, at 8–16.

⁸⁵ GANGALE, *supra* note 16, at 84.

was signed by other nations, “it had been seven years since *Apollo 17*, the last lunar expedition, and the last Saturn V launch vehicles were on static display for tourists.”⁸⁶ In the meantime, by 1979 the Soviet Union had abandoned its manned lunar landing program and the accompanying launch vehicle development.⁸⁷ In the minds of many states, the Moon Agreement was simply too premature to be useful or effective.⁸⁸

C. OTHER SPACE TREATIES

The 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space (“Astronaut Treaty”) requires space-faring nations to rescue stranded astronauts and wayward objects and return them to the appropriate country.⁸⁹ Elaborating on article V of the Outer Space Treaty’s description of astronauts as “envoys of mankind,” the Astronaut Treaty provides more detailed provisions regarding the rescue of astronauts in accidents, distress, emergencies, and unintended landings.⁹⁰

The 1972 Convention on International Liability for Damage Caused by Space Objects was established to resolve concerns over financial liability in the event that a spacecraft or other space machine causes damage to other space-based or Earth-bound assets.⁹¹

Finally, the 1975 Convention on Registration of Objects Launched into Outer Space imposes a requirement that states maintain and submit to the UN thorough records of all objects launched into outer space.⁹²

All of these treaties envision space as a commons beyond the possession and control of any one nation or people. They seek minimal human interference with outer space and celestial bodies and were conceived of in the waning days of colonialism.⁹³ While the intent of the

⁸⁶ *Id.*

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space art. 4, *opened for signature* Apr. 22, 1968, 19 U.S.T. 7570 (1968).

⁹⁰ *Id.*

⁹¹ Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389.

⁹² Registration of Objects Launched into Outer Space art. 2, *opened for signature* Jan. 14, 1975, 28 U.S.T. 695.

⁹³ See Joanne Irene Gabrynowicz, *Space Law: Its Cold War Origins and Challenges in the Era of Globalization*, 37 SUFFOLK U. L. REV. 1041, 1043 (2004).

drafters is noble, this comment argues that the treaties themselves have not served mankind's interests in the decades since their ratification. The uncertainty over the breadth of the Outer Space Treaty and the irrelevancy of the Moon Treaty has produced confusion regarding the international law of space.⁹⁴ As governments cut back on space exploration and development, the private sector is anxious to gain a foothold in space technology, but is apprehensive of the ambiguities and non-possessory declarations of space law.⁹⁵

III. LEGAL REGIMES GOVERNING OTHER AREAS OF THE GLOBAL COMMONS: THE OCEANS, THE DEEP SEABED, AND ANTARCTICA

Existing legal regimes governing other areas of the "global commons" may provide inspiration for crafting a new property law for outer space. Several treaties, ratified by many nations, enshrine the common heritage principles evident in the space treaties, applying these principles to Earth's oceans, Antarctica, and the deep seabed.

A. THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA (UNCLOS)

UNCLOS, ratified in 1982, established a series of legal regimes that would cover territorial seas, contiguous zones, exclusive economic zones, the continental shelf, and the high seas.⁹⁶ UNCLOS established the International Seabed Authority in order to "license and regulate mining in the areas of the ocean covered by [UNCLOS] and also established an intergovernmental mining company, Enterprise, to compete with private mining operations."⁹⁷ UNCLOS also created a forum for hearing and resolving disputes called the "Seabed Disputes Chamber of the International Tribunal" ("Seabed Disputes Chamber"). This chamber has exclusive jurisdiction to hear and settle disputes relating to activities in the international seabed area, including settlement

⁹⁴ Sattler, *supra* note 68, at 30.

⁹⁵ Keefe, *supra* note 22, at 361–62, 364.

⁹⁶ VON GLAHN & TAULBEE, *supra* note 24, at 365.

⁹⁷ Adolph, *supra* note 56, at 972.

of competing property and development claims.⁹⁸ The Seabed Disputes Chamber also has the authority to hear disputes regarding application of UNCLOS, and to render advisory opinions to the UN General Assembly or the International Seabed Authority.⁹⁹ Although the Seabed Dispute Chamber's decisions are final and binding on the parties to the dispute, its decisions do not have binding effect on entities not party to the dispute at hand.¹⁰⁰ Many states, including the United States and other seafaring powers refused to sign the UNCLOS III treaty because they were concerned with the International Seabed Authority's power to control mining projects or other extraction activities connected with the deep seabed.¹⁰¹ Although the United Kingdom, Japan, the Russian Federation, and other European states have now ratified UNCLOS III, the United States remains the only major seafaring nation that has not ratified this treaty.¹⁰²

Under UNCLOS, a state's sovereignty is permitted to extend up to 12 nautical miles off the coast of that state.¹⁰³ This area of sea is referred to as "territorial sea." Until 1945, commercial and national exploitation of the deep seabed beyond the territorial sea was open to all actors.¹⁰⁴ The discovery of substantial oil and natural gas deposits under the continental shelf, however, led to the ratification of the 1958 Convention on the Continental Shelf.¹⁰⁵ This treaty was incorporated into UNCLOS III, which allows states to make claims on the continental shelf up to two hundred nautical miles from their coasts if the seas are continuous to and contiguous with (adjacent to) their territorial waters.¹⁰⁶ These provisions recognize exclusive rights to the seabed and subsoil resources of the continental shelf, although if a state declines to exploit such resources it can nevertheless prevent any other state from doing so without express consent.¹⁰⁷ A coastal state asserting such claims under

⁹⁸ U.N. Oceans and Law of the Sea, Division for Ocean Affairs and the Law of the Sea: Settlement of Disputes (Jul. 20, 2010), http://www.un.org/Depts/los/settlement_of_disputes/settlement_of_disputes.htm.

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ VON GLAHN & TAULBEE, *supra* note 24, at 334.

¹⁰² *Id.*

¹⁰³ United Nations Convention on the Law of the Sea art. 3, Dec. 10 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS III].

¹⁰⁴ VON GLAHN & TAULBEE, *supra* note 24, at 353.

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

¹⁰⁷ *Id.* at 354.

UNCLOS is permitted to construct and operate facilities on the continental shelf for the purpose of the exploration or exploitation of the shelf's natural resources.¹⁰⁸ Thus, private corporations have no independent right under UNCLOS to initiate an exploitation project without state approval.

Another aspect of the UNCLOS III agreement is the creation of the Exclusive Economic Zone (EEZ). An EEZ extends 188 nautical miles from the boundary of a state's territorial sea, and states have certain limited sovereign rights as defined by the UNCLOS III treaty.¹⁰⁹ Within the EEZ, states have the right to conserve and regulate natural resources on the water above the seabed, on the seabed, and in the subsoil of the seabed, as well as the ability to construct artificial islands and other structures.¹¹⁰ However, EEZ sovereignty is limited—other states may navigate EEZs, fly over them, and lay cables and pipelines on the seabed within the EEZ.¹¹¹ Mapping the boundaries of adjacent states' EEZs follow similar principles as those applied in questions regarding continental shelf natural resources discussed above.¹¹²

The UNCLOS III agreement and the institutions it established are a good starting point when considering the architecture of an outer space property law system. The UNCLOS framework manages to unite a broad spectrum of national and private interests into a shared agreement on the possession and usage of a seemingly borderless area of the global commons. Where the UNCLOS agreements cease to be useful is in their practical application to the vast reaches of outer space. While oceans and seas are finite and navigable, outer space is infinite. More succinctly, it is easier to police the oceans and to enforce the UNCLOS framework on the oceans of Earth than to do the same in the infinitude of outer space, where a breaching private party could pursue its interests outside the scope of such an agreement with relative impunity before it was discovered by the relevant international authority. For this reason, a property law system designed to create incentives for transparency and compliance by private parties is required that goes beyond the framework provided by the UNCLOS III agreement.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.* at 358; *see also* UNCLOS III, *supra* note 103, art. 56.

¹¹⁰ VON GLAHN & TAULBEE, *supra* note 24, at 359.

¹¹¹ *Id.*

¹¹² *Id.*

B. THE ANTARCTIC TREATY SYSTEM

The Antarctic Treaty System was signed in 1959, and seeks to establish the continent of Antarctica as a region of peaceful cooperation among all states and peoples.¹¹³ The Antarctic Treaty System is also designed to deal with issues relating to sovereignty in Antarctica and to ensure that the continent is always used for peaceful purposes rather than become a scene of international conflict or discord.¹¹⁴ The Antarctic Treaty System is comprised of four treaties. The Antarctic Treaty governs human activities and cooperation in Antarctica, while the remaining three treaties seek to protect Antarctica's environment, marine life, and seals.¹¹⁵ The Antarctic Treaty is reminiscent of the Outer Space Treaty. It provides that Antarctica shall be used for peaceful purposes only, that scientific investigation on the continent shall be free and cooperative, and that the results of such scientific research shall be exchanged and be made free to all.¹¹⁶ The Treaty adopts the non-appropriation principle prevalent in the space treaties and emphasizes that no activities authorized in it shall form the basis for any claim of sovereignty, ownership, or possession of any portion of Antarctica.¹¹⁷ The Treaty ensures that non-appropriation remains the law of Antarctica by requiring that all stations, installations, and equipment in Antarctica be open at all times to inspection.¹¹⁸

Unlike the Convention on the Law of the Sea, the Antarctic Treaty System does not allow for Exclusive Economic Zones or an equivalent to the International Seabed Authority through which states could engage in extraction and exploitation of Antarctic natural resources. In this manner, it is less instructive to a new property law system for outer space as it forbids any private commercial activity whatsoever in the global commons to which it pertains.

¹¹³ *The Antarctic Treaty System*, SECRETARIAT OF THE ANTARCTIC TREATY, <http://www.ats.aq/e/ats.htm> (last visited May 7, 2011).

¹¹⁴ *Id.*

¹¹⁵ *Id.*

¹¹⁶ The Antarctic Treaty arts. 1–3, Dec. 1, 1959, 12 U.S.T. 794.

¹¹⁷ *Id.* art. 4.

¹¹⁸ *Id.* art. 7.

C. THE DEEP SEABED HARD MINERAL RESOURCES ACT

The U.S. Congress passed the Deep Seabed Hard Mineral Resources Act (“Deep Seabed Act”) in 1980. The Deep Seabed Act provided that the United States would be able to regulate the conduct of U.S. *entities* in areas of common jurisdiction, but not the territory or resources that those entities were attempting to exploit.¹¹⁹ Specifically, Section 3 of the Deep Seabed Act, entitled, “Disclaimer of Extraterritorial Sovereignty,” states that the United States “exercises its jurisdiction over United States citizens and vessels . . . in the exercise of the high seas freedom to engage in exploration for, and commercial recovery of, hard mineral resources of the deep seabed in accordance with generally accepted principles of international law,” but that the United States “does not thereby assert sovereignty or exclusive rights or jurisdiction over, or the ownership of, any areas or resources in the deep seabed.”¹²⁰

The Deep Seabed Act also requires entities wishing to exploit natural resources on the ocean floor to apply for permits and licenses.¹²¹ However, the licenses are conditioned on the entity extracting the resources within ten years of receiving the twenty-year permit—this condition is premised on the assumption that the time limit creates an incentive for speedy mining operations.¹²² The Deep Seabed Act also contains provisions providing for environmental protection, accident investigation procedures, and legal processes.¹²³

While the Deep Seabed Act is not an international treaty, it does provide inspiration for a new property system for a “commons” such as outer space because it manages to regulate the conduct of entities operating within such a commons without resorting to possession or ownership of the commons itself. Thus, the Deep Seabed Act is a notable achievement in that it succeeds in spurring and protecting private investment in an area of the global commons while simultaneously reserving such areas as the “common heritage of mankind.”

¹¹⁹ POP, *supra* note 69, at 69.

¹²⁰ *Id.*

¹²¹ Adolph, *supra* note 56, at 973.

¹²² *Id.*

¹²³ *Id.*

IV. A PROPOSAL: THE U.S. COMMON-LAW AS A GUIDE TO A NEW INTERPLANETARY PROPERTY LAW SYSTEM

This analysis proposes that a new property law system for outer space is required in order to maintain the original treaties' principles while rewarding private space industry for ingenuity and ambition. U.S. common law property concepts inform such a new system. This section will provide a very concise overview of selected relevant U.S. common law property concepts, explain how these concepts can be tailored to a new outer space property law regime, and address potential concerns with this proposal.

A. U.S. COMMON LAW PROPERTY—A CONCISE OVERVIEW

U.S. property law principles are based on the notion of “possession,” which is defined as the exercise and dominion over property.¹²⁴ Private possession of property in the U.S. common law usually implies that the owner of the property has the right to exclude others from the property in question.¹²⁵ U.S. property law has often been described as a “bundle” of rights, in which the possessor of the property has numerous rights to the realty, including the right to use, manage, modify, and alienate the property in question.¹²⁶ Thus, property law in the United States is primarily concerned with who retains possession or ownership of property, and how that possessor exercises the rights of such possession or ownership.

Relevant to this discussion is how real property is possessed, how it is conveyed, and in what manner it is conveyed. In all property conveyances, there are at least two parties: the “grantor” is the party transferring away the property in his or her ownership,¹²⁷ and the “grantee” is the party receiving the property in such a conveyance.¹²⁸ When the grantor has the current possession and legal right to possession in a portion of property, a “present estate” exists.¹²⁹ The grantor's retention of a present estate entitles him or her to own the property or convey the property away to a grantee in numerous ways.

¹²⁴ 63C AM. JUR. 2D *Property* § 1 (2010).

¹²⁵ JAMES CHARLES SMITH ET AL., *PROPERTY: CASES AND MATERIALS* 131 (2d ed. 2008).

¹²⁶ *Id.* at 2.

¹²⁷ 23 AM. JUR. 2D *Deeds* § 1 (2010).

¹²⁸ *Id.*

¹²⁹ SMITH ET AL., *supra* note 125, at 337.

The grantor may choose to convey the property to the grantee as a fee simple absolute. The fee simple absolute is complete ownership until the end of time.¹³⁰ The owner of a fee simple absolute can enjoy the property, transfer it away by sale or gift during his lifetime, or devise it at his death.¹³¹ In this manner, when the grantor conveys a property in fee simple absolute, he transfers *all* his property and accompanying legal rights to the grantee.¹³² Typically, U.S. courts have found that, in the absence of intent to limit the title shown in the conveyance, either expressly or by necessary implication, the grantors pass all the interest they own in the property.¹³³ In other words, absent express language or strong implication indicating otherwise, a grantor in possession of an estate in fee simple absolute will convey the property to the grantee in fee simple absolute. The grantee then possesses the property in fee simple absolute, without any legal or possessory limitations.

Fee simple absolute, however, is only one type of present estate. Grantors may possess and convey property as a fee simple defeasible. Simply put, a defeasible fee is a fee simple absolute that comes to an end, and the possession or conveyance of such property carries with it limits and conditions.¹³⁴ There are three types of defeasible fees. A fee simple subject to condition subsequent is a grantee's fee simple absolute that ends when a specified condition occurs.¹³⁵ When such a condition occurs, the grantor must assert a "right of reverter," at which point the property is reverted back to that grantor's ownership.¹³⁶ A fee simple determinable is similar to a fee simple subject to condition subsequent, except that a fee simple determinable creates an *automatic* reversion to the grantor upon the occurrence of the condition—the grantor need not assert the right of reverter in order to reestablish possession of the property.¹³⁷ Finally, a fee simple subject to executory limitation reverts ownership upon the occurrence of a specified event or condition not back to the grantor, but to an heir or third party.¹³⁸

¹³⁰ BARLOW BURKE & JOSEPH SNOE, PROPERTY: EXAMPLES AND EXPLANATIONS 115 (3d ed. 2008).

¹³¹ SMITH ET AL., *supra* note 125, at 340.

¹³² JOHN E. ADAMSON, LAW FOR BUSINESS AND PERSONAL USE 319 (18th ed. 2008).

¹³³ *See, e.g.*, Roberts v. Rhodes, 643 P.2d 116, 118 (Kan. 1982).

¹³⁴ SMITH, *supra* note 125, at 344–45.

¹³⁵ *Id.* at 348.

¹³⁶ Copenhaver v. Pendleton, 155 S.E. 802, 806 (Va. 1930).

¹³⁷ Roberts, 643 P.2d at 118.

¹³⁸ Mayor of Ocean City v. Taber, 367 A.2d 1233, 1240 (Md. 1977).

Another kind of property interest is the life estate. This property interest describes the conveyance of ownership or possession of property for the duration of the grantee's life.¹³⁹ Upon the death of the possessor, the property reverts back to the grantor or to a third person.¹⁴⁰ Typically, life estates are given by gift or will to a grantee for the life of the grantee, and then revert back to the possession of the grantor or his executors at the time of the grantee's death.¹⁴¹

Leases and licenses are also temporary forms of property conveyances. A lease is a transfer of exclusive possession from the grantor to the grantee; that is, a transfer of fee simple absolute, but only for a limited amount of time.¹⁴² The key in finding the existence of a lease is the lessee's unqualified exclusivity of possession for the specified time duration.¹⁴³ By contrast, a license is an agreement which merely entitles one party to *use* the property subject to the management and control of the other party or grantor.¹⁴⁴

Finally, restrictions on property conveyed or assigned are easements and covenants. Easements are rights, conveyed with the property, that allow the grantor or another party to continue to make some specific use of the property even though it has been devised to a grantee.¹⁴⁵ An express reservation easement allows the grantor to continue usage of the property that he has already conveyed to the grantee.¹⁴⁶ An affirmative easement allows for physical entry or usage by the grantor or third party of property that has already been conveyed to a grantee.¹⁴⁷ Lastly, a negative easement entitles the grantor to prevent the grantee from using the property in a particular manner.¹⁴⁸

A covenant is an agreement between the grantor and grantee in a property conveyance that particular actions or conditions will or will not arise in connection with the grantee's possession of the property.¹⁴⁹ More specifically, a negative covenant restricts the grantee from performing a specified action in connection with the property, and a restrictive

¹³⁹ RESTATEMENT (FIRST) OF PROP. § 18 (1936).

¹⁴⁰ SMITH ET AL., *supra* note 125, at 361.

¹⁴¹ *Id.*

¹⁴² 32 AM. JUR. 1st *Landlord and Tenant* § 61 (1941).

¹⁴³ *See generally* Cook v. U. Plaza, 427 N.E.2d 405 (Ill. App. Ct. 1981).

¹⁴⁴ 40 AM. JUR. 1st *Patents* § 146 (1942).

¹⁴⁵ RESTATEMENT (THIRD) OF PROP.: SERVITUDES § 1.2 (2000).

¹⁴⁶ RESTATEMENT (FIRST) OF PROP. § 473 (1944).

¹⁴⁷ *Id.* § 451(a).

¹⁴⁸ *Id.* § 452.

¹⁴⁹ RESTATEMENT (THIRD) OF PROP.: SERVITUDES § 1.3(1) (2001).

covenant limits the use of the property by the grantee in some way.¹⁵⁰ In contrast, an affirmative covenant mandates that the grantee perform some action or maintain some situation as a condition of the conveyance.¹⁵¹

B. A NEW OUTER SPACE PROPERTY LAW REGIME MODELED ON U.S. COMMON LAW PROPERTY PRINCIPLES

This article proposes that a new property law regime for outer space can be fashioned using the aforementioned U.S. property law principles as constructive inspiration. Such a system can conceivably be fashioned to create limited private possession of outer space resources while retaining the “common heritage of mankind” principles embodied in the current outer space law regime.

The UN treaties require that “mankind” be the owner and guarantor of the solar system’s original pristine condition. In this sense, the world community, through the UN or other similar body, can function as the “grantor” in every facet of cosmic real estate. As such, the grantor can convey land to private entities for the purposes of exploration and/or extraction of natural and cosmic resources. This arrangement seems to allow for every property arrangement mentioned in the previous section except for fee simple absolute. Because the Outer Space Treaty seems to condemn private ownership of outer space, fees simple absolute would contradict the very essence of that treaty’s principles—and the common heritage doctrine—by vesting total ownership of celestial property in private entities.

However, other common law estates, such as defeasible fees and executory fees, as well as leaseholds, licenses, easements, and covenants all provide a new property law system for outer space. Defeasible fees, unlike fees simple absolute, convey realty to the grantee, but with an automatic reversion or right of entry interest. In this manner, private industry can be granted celestial realty to develop, but such conveyances would retain conditions subsequent that, if triggered, would revert the realty back into the control of the multinational community. For example, a lunar mining company could be granted a fee simple determinable for a small section of the moon. Should that mining company engage in rampant environmental degradation or prevent access to the site by international inspectors, the “determinable condition”

¹⁵⁰ *Id.* § 1.3(2–3).

¹⁵¹ *Id.* § 1.3(2).

would be triggered, thus automatically reverting the lunar site back to the total ownership and control of the international community. Other such “determinable conditions” or “conditions subsequent” could include desecration of historic or geologically significant locations, total seizure of the sites by the private entity, or economic concerns such as price fixing or monopolies.

Similarly, leaseholds and licenses can be granted to private space entrepreneurs to rent or use the Grantor’s cosmic realty for a fixed time and for fixed purposes only. Contravention of these conditions would result in automatic termination of the lease or license on the celestial property and reversion to the Grantor’s possession and control. For example, if an outer space heavy metals extraction company wanted to mine the asteroid Ceres for iron ore, the international community, acting as the Grantor, could grant that company a license to mine only specified amounts of iron ore and only in specific locations on the asteroid. Should the company breach these terms, by over-mining or by mining in restricted areas, the license would be revoked. In this manner, licenses and permits for outer space exploration and development could be governed in much the same way that the deep seabed is governed by the United States’ Deep Seabed Hard Mineral Resources Act, in that permits would be granted for resource extraction within a limited time period. Also, just as the Deep Seabed Act regulates the conduct of U.S. entities but not the actual resources they utilize, a license and permit system could regulate private space actors without going so far as to claim ownership or possession of the celestial bodies with which they are concerned. Such a scheme would preserve the “common heritage” principle without encumbering the investments of private space ventures.

Finally, easements and covenants can define the scope of private industry estates or leaseholds in outer space. As on Earth, these property mechanisms can limit the current possessor’s use of the realty in question. For example, an easement could be created for all land granted in defeasible fees to moon mining companies that would allow unrestricted access to UN or other international inspectors. Likewise, restrictive covenants would prevent private industries from causing irreparable or unconscionable damage to celestial natural and historic sites, such as the sites of the *Apollo* landing missions or the spectacular Olympus Mons volcano on Mars. Breach of these easements and covenants would constitute contract breaches as they do on Earth, and the private entity responsible for the infraction would immediately lose all possessory interests granted to them by the international community.

A critical concern is how disputes in these matters might be handled and adjudicated. The current regime of outer space law has only inadequate, ambiguous, and impractical provisions for dealing with disputes arising in outer space.¹⁵² In fact, these provisions do not even mention private entities; they are excessively state-oriented, and they call only for consultation procedures.¹⁵³

Some assert the Outer Space Treaty is more of a “constitution” for outer space than a legal framework, and that the more recent Liability Convention contains provisions that could accommodate dispute resolution for outer space conflicts.¹⁵⁴ The Convention’s Claims Commission allows states to bring liability claims on behalf of corporations and individuals through diplomatic channels within specified statute of limitations periods.¹⁵⁵ The Claims Commission is composed of three members (for every given claim), one chosen by each party and a chairperson chosen by both parties, who decide the merits of the claim and the amount of compensation to be paid to the aggrieved party.¹⁵⁶ While the hearings of the Claims Commission are public, their rulings are only recommendations and are not binding on the parties.¹⁵⁷ These are significant weaknesses when considering the potential applicability of the Liability Convention to a comprehensive outer space property law regime, but the Convention nevertheless does provide a framework for effective dispute resolution should these weaknesses be resolved.

Arbitration has emerged as an avenue for legal dispute resolution in the space sector. The European Space Agency (ESA) provides for binding resolution of disputes through arbitration in conflicts both among member states to the ESA and within contracts and other agreements made with the ESA.¹⁵⁸ International agreements concerning space telecommunications frequently contain compulsory arbitration provisions as do numerous commercial space industry contracts.¹⁵⁹ Those who have studied space law are confident that arbitration will continue to increase

¹⁵² LOTTA VIKARI, *THE ENVIRONMENTAL ELEMENT IN SPACE LAW: ASSESSING THE PRESENT AND CHARTING THE FUTURE* 288 (2008).

¹⁵³ *Id.*

¹⁵⁴ *Id.* at 289–90.

¹⁵⁵ *Id.* at 290.

¹⁵⁶ *Id.* at 291.

¹⁵⁷ *Id.*

¹⁵⁸ *Id.* at 297.

¹⁵⁹ *Id.* at 298.

in popularity as commercial space activities increase and that these arbitrations will proceed within already-established forums, such as through the International Chamber of Commerce.¹⁶⁰

Alternatively, the international community could create a body similar to that of the International Seabed Authority, which handles issues pertaining to the intercontinental shelf under UNCLOS III. Like the International Seabed Authority's Seabed Disputes Chamber, an international adjudicatory forum could hear, arbitrate, and adjudicate disputes between the international community and private cosmic mining and exploration companies. Unlike the Seabed Disputes Chamber, the decisions of the outer space body would be binding to preserve the "common heritage" principle. Additionally, like the Enterprise organization under the International Seabed Authority, a multinational public corporation could compete with private space businesses and have a substantial portion of the profits reaped be directed toward smaller, developing nations. This would ensure non-space-faring nations a stake in the new celestial realm.

C. POTENTIAL CONCERNS WITH A U.S.-BASED PROPERTY LAW PROPOSAL

Many individuals, organizations, peoples, and states are bound to have significant concerns with any outer space property law system that draws heavily on U.S. common law property principles. This comment can only attempt to answer some of these concerns, while grudgingly accepting that any realistic outer space property law system is likely to involve myriad levels of negotiation and inspiration from many of Earth's legal systems before coming to fruition. The proposal outlined in this paper is simply a starting point—an idea meant to serve as a beginning to other ideas, not an end.

Skeptics of even mental journeys regarding *any* property law system for outer space are likely to echo the Archbishop of Canterbury, who remarked in 1957 that "[t]he only people who are interested in this space business are people who have nothing better to think of, poor fellows."¹⁶¹ The same sentiment was repeated in an article in *The*

¹⁶⁰ *Id.*

¹⁶¹ POP, *supra* note 69, at xi.

Economist in 1978, which described space lawyers as “the lunatic fringe of the profession.”¹⁶²

Since these comments were made, humankind has sent robotic probes to almost every corner of the solar system, and *Voyager I* and *Voyager II* have begun their journeys out of the solar system and into the vast expanses of interstellar space.¹⁶³ Private space companies have built and launched commercial space vehicles and have already booked passengers for these purely private flights.¹⁶⁴ NASA recently conducted a successful crash of a probe into the Moon’s south pole that revealed the presence of significant ice water beneath the lunar surface.¹⁶⁵ Even as significant strides are made in the scientific and commercial exploration of space, the commission convened by President Obama has warned that significantly more money is needed to continue pursuing the United States’ exploration of space.¹⁶⁶ All this occurs as some veterans of space science and exploration assert that state agencies such as NASA are moving too *slowly* in their outer space ventures.¹⁶⁷

In summation, the human presence in space is no longer the fantastical fluff of science fiction derided by the Archbishop of Canterbury or *The Economist*. Rather, human activities in space are proceeding at a rapid pace, and a viable property law system is needed to ensure that this accelerated expansion is sustainable and aligned with the goals and ideals of the human community.

Others might justifiably argue that the very expansion of the human presence in space necessarily implies that the current legal system is sufficient to meet the demands of outer space exploration.¹⁶⁸ These people will surely argue that nothing needs alteration in the existing space law regime. This is a valid assumption, but it falls short when considering the long-term implications of human growth in outer space. If humanity’s activities in the cosmos are increasing, then the risk that continued human expansion would undermine the “common heritage” doctrine of the current system necessarily increases, as does the potential

¹⁶² *Id.*

¹⁶³ *Mission Overview*, VOYAGER: THE INTERSTELLAR MISSION, NASA JET PROPULSION LABORATORY (last updated Oct. 19, 2010), <http://voyager.jpl.nasa.gov/mission/mission.html>.

¹⁶⁴ Jack Markowitz, *Enterprisers Bring Space a Bit Closer*, PITTSBURGH TRIB.-REV., Dec. 13, 2009.

¹⁶⁵ CNN.COM, *supra* note 13.

¹⁶⁶ *See generally* U.S. HUMAN SPACE FLIGHT PLANS COMMITTEE, *supra* note 44.

¹⁶⁷ *See, e.g.*, Edward Lu, Op-Ed., *Faster, NASA, Faster*, N.Y. TIMES, Dec. 20, 2009, at A31.

¹⁶⁸ *See generally* Henry R. Hertzfeld & Frans G. von der Dunk, *Bringing Space Law into the Commercial World: Property Rights Without Sovereignty*, 6 CHI. J. INT’L L. 81 (2005).

for human degradation of the solar system's celestial bodies. A viable and practical property law system for outer space can preempt such a fate. In order to preserve the character and history of the solar system's composition, an effective legal system must be in place to prevent rampant human depletion of these cosmic phenomena *before* it occurs.

Yet other people will say that *any* human presence in space should be shunned and that a property law system for space is precisely what must be avoided.¹⁶⁹ These critics might reasonably argue that it took billions of years for the solar system to form as it is, and that the universe is unique for its serenity and *lack* of human alteration.¹⁷⁰ Advocates of this approach might say that a system such as the Antarctic Treaty System is ideal for space in that it can create a "Yellowstone" out of the solar system—an international park where the natural harmony of the solar system is preserved from human contamination for posterity.

This is a beautiful idea, yet it is also an unworkable idea. Simply put, the human destiny is in space. Just as European explorers ventured out toward the Atlantic horizon on voyages of discovery that opened their world to new cultures, ideas, and science, the human exploration of space promises to exponentially expand humanity's knowledge of the universe and its role within it. When asked why he decided to climb Mt. Everest, George Leigh Mallory famously remarked, "because it is there."¹⁷¹ Humans will explore space because it is there. We are a curious species that grows through learning and experience, and our best efforts and impulses are utilized when pursued in furtherance of scientific knowledge. Our task is to undertake what President Kennedy called "the most hazardous and dangerous and greatest adventure on which man has ever embarked"¹⁷² while simultaneously preserving the awe-inspiring vistas of space for *both* human exploitation *and* posterity. Only a legal system that accommodates *both* the human need for resources *and* the necessary preservation of mankind's common heritage can fulfill these criteria. A new outer space property law system, modeled on U.S. common law property principles, can help to further these aspirations.

¹⁶⁹ J.H. Huebert & Walter Block, *Space Environmentalism, Property Rights, and the Law*, 37 U. MEM. L. REV. 281, 286–88 (2007).

¹⁷⁰ *Id.* at 286.

¹⁷¹ *Hazards of the Alps*, N.Y. TIMES, Aug. 29, 1923, at 16.

¹⁷² John F. Kennedy, President of the United States, Address at Rice University in Houston on the Nation's Space Effort (Sept. 12, 1962), in 1 Public Papers of the Presidents of the United States: John Kennedy. 668, 671.

Finally, others will acknowledge the human destiny in space and the need for a legal system to govern such a future but will take umbrage at the notion of U.S. property law and capitalism serving as a basis for such a system.¹⁷³ In particular, some authors assert that the new frontiers of outer space might render capitalism as we know it redundant.¹⁷⁴ These authors will likely argue that the existing space law regime, with its heavy emphasis on the common heritage principle, is the most suitable system for preserving the cosmos for both human exploitation and future preservation.¹⁷⁵ Furthermore, critics might ask why the international community should follow a system that has been the foundation for capitalism, an economic system that many in the world community deride, and that rewards self-interest over community advancement? These critics might assert that any property system based on capitalistic theories will inevitably lead to the appropriation of space by oligarchic corporate entities and the exclusion of the poorer peoples of the world who have at least equal title to the celestial bounty.

As stated earlier, this proposal is meant to be a beginning of a discussion about a new outer space property law system, not an end. It does not consider a capitalist property system to be the only viable option for a new space law, but it does adopt the premise that private space businesses will want some return for the considerable investments required to explore and exploit outer space resources. This return is likely to be demanded in the form of the right to exploit limited areas of space and in proceeds from the sale of space resources. It is necessary to cater to these businesses because competition and individual ingenuity lead to advancement in ideas and technology, and because, as this article has argued, state-run space programs are beset by limited budgets, taxpayer reticence, and shifting political attitudes. This comment is not a manifesto for the capitalization of outer space. Rather, this proposal has tried to cater to the concerns of numerous sides in this debate by balancing the need for private investment in space with retention of the over-arching principles of the common heritage doctrine.

¹⁷³ Amalie Sinclair, *Leading Global Capitalism to the Moon*, SPACE GENERATION ADVISORY COUNCIL (July 24, 2008), <http://oldweb.spacegeneration.org/node/2060> (reporting from the Lunar Space Conference at the NASA Ames Research Center).

¹⁷⁴ GANGALE, *supra* note 16, 234–36.

¹⁷⁵ *See generally* Hertzfeld, *supra* note 168.

CONCLUSION

This paper argues that the existing outer space law regime is hindering the continued human exploration and development of space. As state-sponsored efforts to explore space have faltered, private entrepreneurs are developing the next generation of space enterprises. Because the existing property law of outer space hampers these efforts, this Comment proposes that a new outer space property law, modeled on U.S. common law property principles, can help advance the human journey into space while retaining the “Common Heritage of Mankind” principles at the heart of the existing space law regime. Common law property interests, such as present estates, leaseholds, easements, and covenants, provide a suitable legal framework that will encourage the further human exploration and development of outer space.