

To Build Bifrost: Developing Space Property Rights and Infrastructure

Thomas Gangale*

OPS-Alaska and San Francisco State University, Petaluma, CA 94952

and

Marilyn Dudley-Rowley†

OPS-Alaska and Sonoma State University, Petaluma, CA 94952

In recent years, there has been much excitement over individuals arguing for private land claims on the Moon and Mars as a thrust to commercialize space. There is a fundamental flaw in the logic of those who purport that these bodies or portions thereof may be privately owned. It is true that, “The 1967 Outer Space Treaty prohibits any claims of national sovereignty on the Moon or Mars,” and it is also true that “the treaty says nothing against private property.” It does not follow, however, that without claiming sovereignty, the U.S. could recognize land claims made by private companies that establish human settlements there, as would-be extraterrestrial realtors claim.

As a practical matter, property rights exist only if they are granted or recognized by a government and subject to the protection of law. Such grant, recognition, or protection is an act of state, and as such is an exercise of state sovereignty. Title cannot come into existence out of thin air (or the vacuum of space). Legal title must arise from a sovereign power possessing legal authority over the territory in question. For Congress to pass “land claim recognition” legislation legalizing private claims of land in space would be an exercise of state sovereignty, and therefore a violation of international law under the provisions of the Outer Space Treaty.

There is little need for this in any case. Has there ever been a serious challenge to the US or Soviet/Russian governments over their ownership (or at least their control) of the material they brought back from the Moon? These precedents established a principle of customary law that “if you take it, it’s yours.” Essentially, this derives from the Roman legal principle of *uti possidetis*: “as you possess,” so you may continue to possess.

The real barrier to commercializing space is the huge capital investment that is required to develop a transplanetary infrastructure. Some authors imagine that private enterprise can pull itself up to the Moon and Mars by its own bootstraps. This position ignores the history of opening frontiers. The libertarian mantra that “government is the problem” is nonsensical. Neither is government the entire solution, but it is a necessary partner in the solution—on land and on sea, in the air and in space. Building a transplanetary infrastructure is not something that private enterprise is going to accomplish... ever. First must come the political vision to build rainbow bridges to the heavens, then will come the economic incentive to travel them.

* Executive Director, OPS-Alaska, 2262 Magnolia Avenue, Petaluma, CA, AIAA Student Member.

† Chief Executive Officer, OPS-Alaska, 2262 Magnolia Avenue, Petaluma, CA, AIAA Professional Member.

The key conceptualization is of government and private enterprise in a push-pull relationship. When private interest becomes curious about what lies over the five-year return-on-investment horizon, it nudges government to stand straight and see further over that horizon. If the vista is promising, private interest encourages government to build the rainbow bridge to the pot of gold. Government then gets its piece of the action by taxing that pot of gold.

I. The Forsaken Promise of Space

THE golden age of space exploration was the product of the Cold War. Outer space was simply another front in that war. The US and USSR had strategic and public diplomacy interests in space. That golden age has long since faded. Technocracy, which is the state-directed “force-growing” of specific technologies to serve state interests, can achieve spectacular results in a short period of time. The problem with technocracy is its narrow focus—in time and in purpose. The purpose is power, not wealth. The time span is usually a few years—lasting only as long as it takes to achieve state interests, and the project is terminated once it no longer serves those interests. There may be residual economic benefits from the project, but these are incidental and are not the justification for the resources invested. The calculus is political, not economic.

Techno-economy is the “organically grown” technologies developed for the market. These also serve a narrow interest—producing profit for the investor—but that purpose is long-lived. The project lasts as long as there is a market for the product line. As the science fiction author Poul Andersen once had his space entrepreneur Nicholas van Rijn say, “Politics come and go, but greed goes on forever.”

It is a fundamental mistake to compare the accomplishments of technocracy and techno-economy. “If we can put a man on the Moon, why can’t we build a better mouse trap?” This is not a valid question, any more than asking, “If birds can fly, why can’t fish climb trees?”

However, some space enthusiasts have concluded that government dropped the ball when it came to space development. Moreover, they have concluded that government has kept anyone else from picking up the ball and running with it. As the Apollo era came to a close, it was anticipated that there would be a *fully* reusable launch system, a space station, a Moon base, and human expeditions to Mars, all by the early 1980s. The technology for all of this was either in hand or within reach, so why didn’t any of this happen? Pointing the finger at a convenient scapegoat, frustrated space enthusiasts have adopted the libertarian mantra that “government is the problem,” and not just the US government in particular, but national governments in general and the international treaty regime they have created to govern outer space. Their arguments are overly simplistic and conveniently ignore the fact that there was never a viable economic rationale for the envisioned “space wonders of the ‘80s.” In any case, the libertarian space agenda is promoting ownership rights to extraterrestrial resources and real property, in accordance with current international law where possible, by modifying international law if feasible, but by destroying the international treaty regime if necessary.

II. Owning Planets: The International Legal Perspective

This section provides an overview of the central issues in the current debate over ownership rights to extraterrestrial resources and real property, in order to sort out what is possible, feasible, and necessary:

- Can states recognize claims of private ownership of extraterrestrial real property?
- Can nongovernmental entities appropriate extraterrestrial real property?
- If not, can nongovernmental entities be recognized as having functional property rights?
- Is the private appropriation of extraterrestrial resources legal?
- Do for-profit ventures need to own real property in order to extract resources?
- Can nongovernmental entities develop a common law regime of real property rights?

A. State Recognition of Private Claims to Real Property

The Outer Space Treaty, Article II states:

Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.¹

Article VI states:

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by nongovernmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty.²

Alan Wasser, a former chairman of the National Space Society (NSS), asserts:

Congress could pass legislation providing that for any private, non-government corporation or consortium that financed and built a space transportation system and permanent Moon base, a limited (but still very large) claim to lunar land around the base would be legally “recognized” by the U.S. government.

Recognition means the government would acquiesce to, or decide not to contest, the claim, but not assume any sovereignty over it.³

Wasser proposes federal legislation that would have the United States recognize extraterrestrial claims to real property, based on a unilateral reinterpretation of the Outer Space Treaty. The Space Settlement Initiative appears on the NSS website, although the NSS has not endorsed it.⁴ Both the Artemis Society and the Moon Society have endorsed the initiative, and it may also have some support within the Mars Society.

Wasser’s idea is based on an obvious logical fallacy. The fact that only states are parties to international agreements cannot be construed to mean that they have no bearing on nongovernmental entities. States bear international responsibility for the activities of nongovernmental entities under their jurisdiction. A state cannot license nongovernmental activities that are prohibited to the state. For example, the US cannot get around the 1963 Test Ban Treaty by licensing a contractor such as Halliburton to detonate a nuclear device above ground. If states were to recognize a real property claim by a nongovernmental entity under its jurisdiction, this would constitute national appropriation by “other means,” in violation of Article II of the Outer Space Treaty. As Leslie I. Tennen states, for a state to recognize a claim of its citizens while not claiming sovereignty “is a distinction without a difference.”⁵ Space law specialist Wayne N. White:

...is not aware of any serious, informed lawyers from any nation who argue that states party to the Outer Space Treaty have a right to confer or recognize real property rights which involve any exercise of national jurisdiction over extraterrestrial territory. The only people who make such assertions are uninformed individuals who are neither trained in nor adequately knowledgeable about international space law.⁶

It should be noted that Wasser has been promoting his idea for nearly 20 years, yet in all that time, not one member of Congress has introduced such a bill.⁷

B. Nongovernmental Appropriation of Real Property

White states:

Article II of the Outer Space Treaty prohibits territorial sovereignty but does not prohibit private appropriation. Hence, private entities may appropriate area in outer space or on a celestial body, although states may not.⁸

Again, this argument conveniently ignores the “any other means” clause of Article II, as well as its tie to Article VI, which obligates states to assure that national activities, including those of nongovernmental entities, are carried out in conformity with the provisions of the treaty. Thus, states have a duty to revoke the license of a national entity, or entity launching from its territory, that violates provisions of the treaty. As space law specialist Lawrence A. Cooper states:

Some have argued that OST’s broad definitions allow individual appropriation of space and celestial bodies because it only specifically prohibits appropriation by States; however, States are responsible for the actions of individuals, and property claims must occur through the State’s property laws. Therefore individuals may not claim space or celestial bodies.⁹

Economist Sam Dinkin, who advocates the development of real property rights in outer space, likewise believes that they do not exist under current treaty language:

The Outer Space Treaty of 1967, which has been ratified by 98 nations and signed by an additional 27, forbade property rights in space. No nations can make property rights claims. Further, the conventional interpretation of the treaty is that no one at all can make property rights claims.¹⁰

In addition to considering arguments based on Articles II and VI, it should be noted that Article I states:

Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies.¹¹

Shin Hongkyun has pointed out: “Appropriation of vast tracts of land for their exclusive use violates Article I, and is unnecessary to ensure non-interference in the vicinity of an activity.”¹² Certainly the appropriation of Alaska-size and even US-size territories as advocated by Wasser’s Space Settlement Institute is antithetical to “free access.”

Some space property rights advocates, such as Arjen van Ballegoyen, would circumvent this inconvenient treaty by unilaterally reinterpreting it:

Article 2 of the treaty... needs to be interpreted in a restrictive, literal meaning, namely as just the prohibition of national appropriation. This interpretation would allow other entities like private companies and nongovernmental organizations to appropriate territory.¹³

Of course, this is no legal remedy at all. Just as with Wasser's idea that governments can permit private activities that are prohibited to themselves, Ballegoyen's idea of arbitrary interpretation makes a mockery of legal principle. The Law of Treaties, Article 31, Paragraph 1 states:

A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in light of its object and purpose.¹⁴

Meanwhile, White's statement *supra* is not intended to assert a theory of unlimited real property rights, as he goes on to clarify:

Although proponents of space development would undoubtedly welcome the economic incentive of unlimited appropriation, such claims should not be recognized. This form of property rights could potentially preclude free access to outer space in the same manner as territorial sovereignty would preclude free access. Finally, as a point of law, recognition of real property rights beyond the confines of space facilities would be inconsistent with the common law theory of property.¹⁵

What sort of property rights, then, does White foresee in outer space?

C. Functional Property Rights

Nicholas Katzenbach refers to "primary rights... in a localized facility" that exist by virtue of the activity ongoing in the facility, independent of any consideration of real property ownership.¹⁶ White applies this idea to outer space activities:

...[S]tates may legislate with respect to a broad range of both public and private activities; and, in most circumstances, they exercise as much authority within the vicinity of their space facilities as they would within their territory on Earth.

Under a regime of functional property rights, title would arise on the basis of a principle entirely different from traditional property rights. Conferral of title would not depend upon a government's control over a specific area, but rather upon its control over the space objects and personnel at that location.

In space, first-come, first-served occupation, and the prohibition against harmful interference with other states' activities provides states with a similar, albeit less clearly defined, right of exclusion.... Functional property rights would be subject to the limitations of [Outer Space Treaty] Article VIII jurisdiction. These rights would terminate if activity were halted, as for example, if a space object was abandoned or returned to Earth. Finally, rights would be limited to the area occupied by the space object, and to a reasonable safety area around the facility.¹⁷

Article VIII provides:

A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth.¹⁸

But how does this jurisdiction translate into "functional property rights... around the facility?" Article IX states:

If a State Party to the Treaty has reason to believe that an activity or experiment... would cause potentially harmful interference with activities of other States... it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State Party to the Treaty which has reason to believe that an activity or experiment planned by another State Party... would cause potentially harmful interference... may request consultation concerning the activity or experiment.¹⁹

This right to be free of "potentially harmful interference with activities" gives rise to functional rights in the vicinity of the activity. Arguably, this right is implicit in the Outer Space Treaty; however, White proposes that the major launching states conclude a "mini-treaty" to explicitly provide for functional property rights. The idea of a "mini-treaty" is meant to circumvent the forum of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), which includes many non-launching states that have sought to limit the rights of launching states to appropriate extraterrestrial resources. In the absence of any new international agreement, however, with the language of the Outer Space Treaty as a springboard, functional property rights might develop as customary law as the national entities of launching states extract such extraterrestrial resources.

D. Private Appropriation of Resources

In seeking to justify overthrowing the current treaty regime (by arbitrary interpretation or otherwise), Ballegoyen makes the situation seem worse than it really is:

The phrase "for the benefit and in the interest of all mankind," mentioned in the first paragraph of article 1, has traditionally been interpreted as the sharing of either profits or scientific discoveries and advances.²⁰

The actual language in Article I is "for the benefit and in the interest of all *countries*," [emphasis added]. It appears in the context of "free access" (Paragraph 2) and "freedom of scientific investigation" (Paragraph 2). There is no communist plot here. On the contrary, Gennady M. Danilenko, a Soviet expert on international law, asserts:

...[T]he Outer Space Treaty proclaims freedom in the use of outer space, which, as generally recognized, includes the freedom to exploit its resources....²¹

Dinkin agrees:

The Outer Space Treaty does not forbid *in situ* resource utilization. Space is treated like a commons. Astronauts have brought home space rocks and taken title to them. If you want resources on Mars or the Moon, take them.²²

White adds:

...[A]lthough entities may not claim ownership of mineral resources “in place,” once they have been removed (i.e. mined) then they are subject to ownership.²³

Goldman provides the historical context of Article I:

From the beginning, the U.S. position has been that in the Outer Space Treaty, Article I, “use” includes resources. In negotiations on this language, the French and the Hungarian representatives likewise acknowledged that “use” included “exploitation” of resources and other attributions and applications of outer space.²⁴

The customary law that has developed since 1967 accords with this principle. American and Soviet/Russian ownership of lunar samples has never been challenged. Furthermore, some lunar material (sold by the Russian government) is now privately owned. The language of the 1979 Moon Agreement, Article 11, Paragraph 3 should also be considered:

Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or nongovernmental organization, national organization or nongovernmental entity or of any natural person.²⁵

The American delegation’s statement in UNCOPUOS, at the time that the Moon Agreement was negotiated, that the words “in place” allow private property rights to apply to resources upon extraction, went unchallenged.²⁶ Although the Moon Agreement is not binding on the US (nor on most other states), the delegation’s unchallenged statement is additional evidence of customary law on this point.

Also to be considered is the United Nations Convention on the Law of the Sea (UNCLOS), Annex III, Article 2: “Title to minerals shall pass upon recovery to the entity which mined them.”²⁷ Since UNCLOS has been widely accepted by the international community, and since much of space law derives from maritime analogies, this principle can be applied to outer space as a point of customary law.

Finally, the Russian Federation has set the precedent of incorporating this principle into its municipal law: “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....”²⁸

E. The Necessity of Real Property Rights

Do for-profit ventures need to own real property in order to extract resources? Ballegoyen (2000) thinks so:

...[W]e have to come up with a more appropriate regime. Such a regime would have to include the possibility of acquiring ownership of the territory itself. This is the only way to increase the available level of incentives.²⁹

However, since outer space is to be “free for exploration and use by all States,” and by devolution, by the private parties of all states, what is the point of there being private property rights in the traditional sense? If a private party has the means to go to the Moon or other celestial body and to use the resources there, it is free to do so. Shin states: “Outside the Sovereign territory of any state, the occupation of a private person over certain land is a mere fact.”³⁰ Likewise, Tennen deflates Ballegoyen’s assertion of the need for “ownership of the territory itself:”

It is unlikely that a state which granted authorization to a private entity purposely would interfere with the activities of that authorized entity.

It also is unlikely that an authorized entity would be subject to interference by another entity granted authority by the same state licensing regime. The offender would have a hard time obtaining future licenses.

The Outer Space Treaty obligates states to prevent harmful interference with the activities of other states, and to participate in consultations where such interference may occur. A state bent on perpetrating such interference would not be deterred by the assertion of a claim of private ownership of an area of a celestial body.³¹

To this we would add the argument that if it were profitable for a company to go to the Moon and pick up rocks, it would. But it is not profitable at this time. So, how does it make it any more profitable if the company can claim title to the land for miles around the rocks that are too unprofitable for it to pick up, land that contains yet more unprofitable rocks?

Finally, Earth is replete with examples of private, for-profit activities on public land, such as livestock grazing and timber harvesting. There are also examples of such private activities in the *res communis* beyond national boundaries, such as the extraction of petroleum in maritime Exclusive Economic Zones. Exxon-Mobil and BP-Amoco do not own the continental shelves, and they do not need to.

F. The Possibility of a Common Law Regime

Declan O'Donnell's initiative is the epitome of the well-worn phrase, "thinking outside the box;" not only has he thought in the black space outside of Earth's atmosphere, he has thought in the white space within the international treaty regime:

The Regency of United Societies in Space (ROUSIS)... is a common law government trust with a character of compliance to space treaty principles. The Regents are trustees and Humankind is the beneficiary. Space resources are the *res* of this trust. The constitution has extended common law into outer space not only for the purpose of accommodating this new citizen movement entity, but, also, for the purpose of establishing a basis for law and order among settlers.

There is no intent nor legal capacity to replace treaty law. Instead, the idea is to supplement it with workable and equitable solutions to every day space settlement problems.³²

O'Donnell draws his inspiration from the tradition of English common law and courts of equity, which the United States inherited:

Common law remedies were available only while the Kings and Queens of England, or the Congress of the United States here in America, did not object and there was no remedy at law under their dominant paradigm. Only then could the Common Law Courts of Equity grant an equitable remedy to supplement the legal system in place.³³

O'Donnell's ROUSIS recognizes the sovereign states of the international system as the kings and queens, and the treaty regime as the sovereign law. So long as the sovereigns do not object and there is no remedy at international law, the ROUSIS arrogates the authority to grant an equitable remedy to supplement the legal system in the character of a common law court of equity. The ROUSIS Constitution, Article II, Section 12, provides:

ROUSIS shall have the following governance powers in order to prepare settlements and municipalities in space for future self-governance.

A. To establish and maintain a body of Common Law estates in property, such as tenancies of 99 years or less, easements, and trust estates, as well as a Common Law of contracts, torts, and criminal laws, as extended to outer space herewith.³⁴

The ROUSIS convention was noticed to all UN offices, all UN delegations, and to all space agencies. No objections were received. NASA appointed an observer, which signifies the acquiescence of the US government for the time being.³⁵ Although brand new, ROUSIS is a fact, and it not only has the capacity to create common law, but over time, the possibility of serving as a source of customary law for the international legal system. In this context, the establishment of property rights (but not title in perpetuity) is an expression of popular sovereignty rather than an exercise of national sovereignty.

III. The Constitution of Outer Space

The preceding overview of the international legal regime has asked six specific questions regarding the ownership of extraterrestrial real property and resources, concluding:

- States cannot recognize claims of private ownership of extraterrestrial real property. The Outer Space Treaty bars states parties from recognizing real property ownership claims, even if originating in another state.
- Nongovernmental entities cannot appropriate extraterrestrial real property. The Outer Space Treaty negates the legality of real property ownership claims. The United States may not unilaterally reinterpret the treaty so as to construe the legality of real property ownership claims.
- Nongovernmental entities can be recognized as having functional property rights. Certain acts of possession and use are required if such claims are to have legal standing, and a specified lapse in activity may extinguish the claim.
- The private appropriation of extracted extraterrestrial resources is legal. Ownership of and the right to use extraterrestrial resources is distinct from ownership of real property; the former does not require the latter, and while the latter is illegal, the former is permissible under present law.
- For-profit ventures do not need to own real property in order to extract resources. Numerous precedents exist on Earth that can apply by analogy to outer space.
- Nongovernmental entities can develop a common law regime of real property rights. The power to grant an equitable remedy to supplement the legal system in place arises when there is no remedy under the sovereign law and the sovereigns do not object.

The current international legal framework thus accommodates any legitimate space enterprise conceivable. Nearly all who claim otherwise are neither experts in space law nor in international law, and have either innocently

misread the existing treaty language or have deliberately misinterpreted the law to further certain political agendas. The official statements of members of the Bush administration and quotes from space enthusiasts provides an instructive study in contrasts. From Norman P. Neureiter, Science and Technology Adviser to the Secretary of State:

...[T]he Outer Space Treaty and three related UN conventions... serve as the bedrock of international space law. This was an example of multilateral diplomacy at its best; the international rules that were created afford a measure of transparency and accountability for space activities, without constraining national programs.³⁶

From Ambassador Kenneth Brill, Permanent Representative of the United States of America to the United Nations in Vienna:

This 35th anniversary of the Outer Space Treaty is also an opportunity for us to address the fact that the world is far from general acceptance of the four core space law instruments: the Outer Space Treaty, the Rescue and Return Agreement, and the Liability and Registration Conventions. Several key States have not accepted key treaties, including some members of COPUOS. This Subcommittee should make a clear call for States to ratify and implement the four core space law instruments cited above. And, of course, it should encourage States that have accepted the core instruments to look at the sufficiency of their nation's laws to implement them. Parties ought to ensure that they are indeed doing what they have promised they will do.³⁷

From Kenneth Hodgkins, U.S. Adviser to the Fifty-Seventh Session of the UN General Assembly:

The Outer Space Treaty was in many ways the foundation of the now well-established field of space law and it set the framework and cooperative tone for tremendous technological progress in outer space activities. In no small part, these accomplishments can be attributed to the role of COPUOS and its Legal Subcommittee. Under this legal regime, space exploration by nations, international organizations and, now, private entities has flourished. As a result, space technology and services contribute immeasurably to economic growth and improvements in the quality of life around the world. The Outer Space Treaty has truly stood the test of time; its provisions remain as relevant and important today as they did at the inception of space exploration.³⁸

These statements by representatives of the most unilateralist American administration since the Second World War express the depth of the American commitment to the Outer Space Treaty. If the Bush administration backs the treaty to the hilt, certainly a more multilateralist Democratic administration would do no less. Thus there is virtually no chance that the United States will ever undermine the treaty by passing national legislation contrary to its principles, as Wasser advocates with his Space Settlement Initiative. Meanwhile, the disregard for international law expressed by some space development advocates is truly shocking. From Alan Wasser, Chairman of the Space Settlement Institute:

Some suggest the U.S. should [opt out of the Outer Space Treaty].... I would personally like to see that happen.³⁹

The online publication *Reason* reports:

Jim Benson plans to declare ownership of an asteroid orbiting between Earth and Mars. And he doesn't much care what the United Nations has to say about it. "If the U.N. doesn't like it, they can send a tank up to my asteroid, which of course they can't."⁴⁰

SpaceDev CEO Benson has also said, regarding the position of the United States and the United Nations with respect to private property ownership in space: "I don't believe they have an official position, and if they did, I wouldn't care because I don't believe they have legal standing in space - they are earth-based."⁴¹

Dinkin has called repeatedly for withdrawal from the Outer Space Treaty:

If bilateral agreements and the Outer Space Treaty do not provide an adequate regulatory environment for commercialization and colonization, then perhaps the treaty should be amended or the US should withdraw.⁴²

Let's withdraw from the Outer Space Treaty and establish a private property rights regime that opens up a new land rush into space.⁴³

The United States should commence international negotiations to amend the 1967 Treaty of Outer Space or withdraw from it...⁴⁴

Finally, there is Representative Tom Feeney's (R-FL 24th, which includes Kennedy Space Center) "thought exercise" in futility:

As a thought exercise, assume that the United States withdrew from the 1967 Outer Space Treaty - as that treaty allows - and stated it would establish and enforce a private property scheme for space-related economic activities. What types of economic ventures would assemble to take advantage of this opportunity? How would their demand for space vehicles, launch facilities, and related technological innovations transform the aerospace industry and Florida's Space Coast? Finally, how would these activities complement NASA's exploration ventures (Feeney 2004)?⁴⁵

The answer to Representative Feeney's questions is that United States withdrawal from the Outer Space Treaty would have a chilling effect like nuclear winter on private enterprise in outer space, because withdrawing from the treaty would shatter the "bedrock" and "foundation" of international space law, and the entire edifice would collapse. While the congressman suggests that the United States could "establish and enforce a private property scheme for space-related economic activities," no other space launching state would recognize such a "scheme," and few reputable private enterprises would wish to take the risk of doing business in such a lawless environment. Representative Feeney's district would be known as the Space Coast primarily for its "Space Available for Lease"

signs. It should be noted that Feeney is careful not to actually advocate withdrawal from the treaty, thus his “thought exercise” is mere lip service to *laissez-faire*. That Representative Feeney has not even taken the less drastic course (than outright withdrawal) of introducing Wasser’s proposed legislation is further evidence that his statement is an exposition of empty rhetoric. If *laissez-faire* Republican Feeney, a member of the 109th Congress’ Subcommittee on Space and Aeronautics who represents the Space Coast, will not introduce Wasser’s bill, who will?

Danilenko observes, “Expanding space economic activities require the creation of a favorable legal framework.” It should be obvious that withdrawing from the Outer Space Treaty, which Danilenko calls “the basis for all subsequent treaties and other legal instruments relating to space activities,” is hardly the way to go about this.⁴⁶

A final observation regarding the nature of the Outer Space Treaty should drive home the enormity of advocating withdrawal from it. This would not at all be the same thing as withdrawing from the 1972 Anti-Ballistic Missile Treaty, which was between two states. As the codification of near-universal principles, the treaty is regarded as the “constitution” of outer space.

Jus cogens are peremptory norms of general law. Although they bear a resemblance to natural law, these norms are emanations of positive law, reflecting the evolving consensus of the civilized world.... Christol has suggested [“The Jus Cogens Principles and International Space Law,” IISL 26(1983):1] that the modified *res communis* (space for the benefit of all humanity) and other principles in the 1967 Outer Space Treaty are candidates for the *jus cogens* status.⁴⁷

Jus cogens is Latin for “compelling law:”

A peremptory norm... is a fundamental principle of international law considered to have acceptance among the international community of states as a whole. Unlike ordinary customary law that has traditionally required consent and allows the alteration of its obligations between states through treaties, peremptory norms cannot be violated by any state.

The number of peremptory norms is considered limited but not exclusively catalogued. They are not listed or defined by any authoritative body, but arise out of case law and changing social and political attitudes. Generally included are prohibitions on waging aggressive war, piracy, genocide, slavery, and torture.⁴⁸

Jus cogens principles cannot be circumvented by withdrawing from the treaties that codify them. Thus, if the Outer Space Treaty is *jus cogens* (and the fact that it has been ratified by 98 states and signed by 27 others makes a strong case for this), even if the U.S. withdrew from the treaty, it would still be bound by its principles.

IV. Social Balance in Space

Although there may be regulatory red tape that national governments need to streamline in order to lower barriers to private enterprise in outer space, the hue and cry over extraterrestrial real property rights is a red herring. Opening the floodgates to corporate planetary land grabs would close free access to space that the current international legal regime guarantees. Abrogating the international legal structure that has kept the peace in outer space for four decades would sow the seeds of future interplanetary armed conflict.

The real barrier to commercializing space is the huge capital investment that is required to develop a transplanetary infrastructure. Libertarian space cowboys imagine that private enterprise can pull itself up to the Moon and Mars by its own bootstraps. These assertions ignore the history of opening frontiers.

In the early days of railroads, a private company might build a line from New York to Buffalo, but New York was already there, Buffalo was already there, and there were Albany and Schenectady in between. On the other hand, the transcontinental railroad that opened the West was a massive US government project to span a vast expanse of nothingness. Similarly, the Russian government built the trans-Siberian railroad.

A French joint-stock company went bankrupt beginning the Panama Canal; the US government stepped in and finished the job. The St. Lawrence Seaway was the joint project of two national governments, eh?

The US government funded the interstate freeway system, which enabled a massive expansion of the automobile industry, trucking industry, the oil industry, and the suburbs.

The airline industry initially developed under federal contracts to transport mail. The Boeing B-707 was developed under an Air Force contract as the KC-135 tanker. The Lockheed L-1011 Tristar development project bankrupted not only Lockheed but Rolls-Royce as well, which was developing the jet engines for that airliner; the US and British governments stepped in to bail out these companies.

The commercial space launchers in service today were all originally developed on government contracts.

Today, private companies build and operate trucks, ships, aircraft, launch vehicles, and satellites, but it is governments that maintain the highways, seaports, airports, and spaceports--the infrastructure that is the foundation of all of these commercial activities.

Developing infrastructure is a huge capital investment, while maintaining and operating it has a very low profit margin at best. This is something that government is better positioned to do than private enterprise. It has long been recognized that government has a legitimate role “to promote the general welfare” by providing the public goods that enable private goods to flourish.

The libertarian mantra that “government is the problem” is nonsensical. Neither is government the entire solution, but it is a necessary partner in the solution--on land and on sea, in the air and in space. Building a transplanetary infrastructure is not something that private enterprise is going to accomplish... ever. First must come the political vision to build rainbow bridges to the heavens, then will come the economic incentive to travel them.

What makes libertarian rhetoric so seductive is that government seems to have dropped the ball. The Golden Age of Mercury, Gemini, and Apollo is long gone. During that time, anything seemed possible. It was anticipated that there would be a *fully* reusable launch system, a space station, a Moon base, and human expeditions to Mars, all by the early 1980s. The technology for all of this was either in hand or within reach, but there was no political necessity, and there certainly was no economic rationale. Clearly, if government were the problem, private enterprise failed to provide a solution. Private enterprise never built a space station or a Moon base, or sent humans to Mars. Is it likely to in the near future?

Government has been getting an increasingly bad rap in the space advocacy community since the end of the Apollo era, but in truth the mad dash to the Moon was unsustainable, and measuring subsequent progress against the Apollo standard reflects unrealistically high expectations. Apollo was a Cold War anomaly that has not been repeated, and that may have no analog in the future.

Again, the central problem is infrastructure. When the Apollo program ended, it left some ground infrastructure (assembly and launch facilities later used by the Space Shuttle program) but no space infrastructure, and in that respect it was a developmental dead end. Political motivation for government to build lasting infrastructure is generated by private sector anticipation of colonizing a new human ecology in which it can produce profit. This is the common thread in all of the aforementioned government infrastructure projects. In contrast, no government has bothered to build a tunnel under the Bering Strait; there are no roads on either side, and so there is little prospect of a sustainable human ecology there. This is not to say that there will never be a Bering Tunnel, just not any time soon.

This may sound like a chicken-and-egg problem. Private enterprise is ill-positioned to develop infrastructure that it requires to thrive. Technocracy--government-directed technological development--has its limits, and may be politically motivated to develop capabilities that have little or no economic utility. A case in point is the depopulation of Siberia that has been occurring since the collapse of communism. The Soviet Union built infrastructure and forcibly moved population in a massive effort to colonize Siberia and extract its natural resources. Under a command economy, it was not clear that this was an uneconomical project, but as Russia has transitioned to a market economy, an increasing number of people have found that they cannot make a decent living in Siberia despite its vast natural wealth. There are enormous costs associated with extracting those resources in the extreme environment, and furthermore, there are considerable costs attached to transporting goods out of this remote region of the Earth to market. So, millions of Russians are abandoning the frontier to return to the bosom of Mother Russia's European heartland. Now, Siberia is paradise next door compared to the distant and forbidding Moon and Mars, yet here private enterprise is retreating from an ecology that government established. Private enterprise only recently duplicated Alan Shepard's 1961 suborbital flight. How credible is it that private enterprise is going to blaze trails to the planets in our lifetime?

It is about as credible as the hype about living on the Moon that baby boomers read in the *Weekly Reader* 40 years ago, or the grand vision of solar power satellite constellations 30 years ago, or a fleet of commercially owned and operated Space Shuttles 20 years ago, or the Iridium mobile telephone satellite constellation 10 years ago. It seems like every time you turn around, space endeavors are being oversold, whether they are governmental or commercial.

However, developing a spacefaring civilization is not an insoluble chicken-and-egg conundrum. It is more subtle than that, and there are solutions--not in all cases, but on the margins. Obviously, progress does occur, and while the pace of progress is not immutable, it does have constraints. The key conceptualization is of government and private enterprise in a push-pull relationship. When private interest becomes curious about what lies over the five-year return-on-investment horizon, it nudges government to stand straight and see further over that horizon. If the vista is promising, private interest encourages government to build the rainbow bridge to the pot of gold. Government then gets its piece of the action by taxing that pot of gold.

The challenge is in recognizing that not every horizon hides a pot of gold, or if it does, it can be too costly to bring it home with the means at hand. Space technology is not a magic wand, and the High Frontier is not the Promised Land. *Laissez-faire* libertarianism is not the answer to space development any more than command-economy technocracy was; rather what is required is, as John Kenneth Galbraith prescribed for the United States half a century ago, a social balance between public goods and private goods.⁴⁹ The concept of and need for sociopolitical balance between various economic power centers in society, including government, corporations, organized labor, international civil society, *et cetera*, is also described in Raymond Miller's Multicentric Organizational model of political economy.⁵⁰ For space development to proceed and to succeed there must be a

partnership between government and enterprise as well as among governments and enterprises, a transnational partnership of governmental and nongovernmental entities.^{51, 52} It is not merely corporations, but all sectors of human society, that must go into space.

V. Conclusion

In a post to an AIAA-affiliated web log, Wasser stated in regard to his proposed Space Settlement Initiative to have the US Congress enact legislation to unilaterally recognize real property claims in outer space:

Of course, there will be dissenters who will say they deplore such unilateral action on the part of the United States. Perhaps they'll also say, in their view, the U.S. is an international outlaw. But the reward will be of immense benefit to all mankind by expanding the habitat of humanity and opening the space frontier for all.⁵³

To which the authors reply:

“For what shall it profit a man, if he shall gain the whole world, and lose his own soul?” --Mark 8:36

We believe as passionately as anyone in the vision of expanding the human ecology into space. We believe that ultimately it is a matter of survival for our species. We are outgrowing the Earth, and although we must redouble our efforts to be good stewards of the Earth, we need more living space. But, we should be wary of any person or faction to whom the ends justify the means, for it then becomes all too reminiscent of Manifest Destiny and Lebensraum. As devoted as we should be to humankind's reach into space, we should be just as committed to the rule of law. We should not be so fanatical as to advocate achieving our goals in space through outlawry on the New Frontier. We believe that America should lead, but it should not stampede in a spasm of superpower hubris, the international institutions that it has built by patient labor in the course of many decades. It is neither in the national interest, nor is it in the interest of humanity as a whole, for America to gain this or other worlds, and lose its own soul.

References

¹United Nations. 1967. “Treaty on Principles Governing the Activities of States in the Exploration of Outer Space, Including the Moon and other Celestial Bodies.” 610 U.N.T.S. 205. Internet. Available from <http://www.iasl.mcgill.ca/spacelaw/outerspace.html>; accessed on 17 September 2004.

²Ibid.

³Wasser, Alan. 1997. “How to Restart a Space Race to the Moon and Mars.” Moon Miners’ Manifesto, #103, March. Internet. Available from <http://www.asi.org/adb/06/09/03/02/103/space-race.html>; accessed 19 March 2005.

⁴Wasser, Alan B. 2004. “The Space Settlement Initiative.” Space Settlement Institute. Internet. Available from <http://www.spacesettlement.org/>; accessed 19 March 2005.

⁵Tennen, Leslie I. 2003. “Commentary on Emerging System of Property Rights in Outer Space.” United Nations - Republic of Korea Workshop on Space Law. Internet. Available from <http://www.oosa.unvienna.org/SAP/act2003/repkorea/presentations/specialist/ost2/tennen.doc>; accessed 19 March 2005.

⁶White, Wayne N. 2004. “Interpreting Article II of the Outer Space Treaty.” IAC-03-IISL.2.12. Internet. Available from <http://www.spacelawstation.com/whiteArtII.pdf>; accessed 18 March 2005.

⁷Wasser, Alan B. 1988. “National Space Society Airs ‘67 Outer Space Treaty Reservations.” Space Daily, 5 February. Internet. Available from <http://www.space-settlement-institute.org/Articles/archive/TreatyReservations.pdf>; accessed 25 March 2005.

⁸White, Wayne N. 1998. “Real Property Rights in Outer Space.” Proceedings, 40th Colloquium on the Law of Outer Space, p.370. Internet. Available from http://www.spacefuture.com/archive/real_property_rights_in_outer_space.shtml; accessed 19 March 2005.

⁹Cooper, Lawrence A. 2003. “Encouraging Space Exploration Through a New Application Of Space Property Rights.” Space Policy, 19, 111–118.

¹⁰Dinkin, Sam. 2004. “Don’t Wait for Property Rights.” Space Review, 12 July. Internet. Available from <http://www.thespacereview.com/article/179/1>; accessed 19 March 2005.

¹¹United Nations. 1967.

¹²Shin Hongkyun. 2003. “System of Property Rights in Outer Space.” United Nations - Republic of Korea Workshop on Space Law.

¹³van Ballegoyen, Arjen F. 2000. “Ownership of the Moon and Mars?” Ad Astra, January/February. Internet. Available from <http://www.space-settlement-institute.org/Articles/archive/BallegoyenOwn.pdf>; accessed 19 March 2005.

¹⁴United Nations. 1969. “Vienna Convention on the Law of Treaties.” 1155 U.N.T.S. 331. Internet. Available from <http://www.amanjordan.org/english/un&re/un2.htm>; accessed on 1 July 2005.

¹⁵White, Wayne N. 1998.

¹⁶Katzenbach, Nicholas. 1965, “The Law in Outer Space”, in Space: Its Impact on Man and Society, L. Levy ed.

¹⁷White, Wayne N. 1998.

¹⁸United Nations. 1967.

¹⁹Ibid.

²⁰van Ballegoyen, Arjen F. 2000.

- ²¹Danilenko, Gennady M. 1989. "Outer Space and the Multilateral Treaty-Making Process." Berkeley Technology Law Journal, Vol. 4, No. 2. Internet. Available from <http://www.law.berkeley.edu/journals/btlj/articles/vol4/Danilenko/HTML/text.html>; accessed 19 March 2005.
- ²²Dinkin, Sam. 2004.
- ²³White, Wayne N. 1998.
- ²⁴Goldman, Nathan C. 1988. American Space Law: International and Domestic. Iowa City, Iowa: Iowa State University Press. p. 70.
- ²⁵United Nations. 1979. "Agreement Governing the Activities of States on the Moon and Other Celestial Bodies." 1363 U.N.T.S. 3. Internet. Available from <http://www.iasl.mcgill.ca/spacelaw/moon.html>; accessed on 17 September 2004.
- ²⁶United Nations. 1979. Document No. a/AC.105/PV.203.
- ²⁷United Nations. 1982. "United Nations Convention on the Law of the Sea." 1833 U.N.T.S. 3. Internet. Available from http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf; accessed on 29 November 2004.
- ²⁸Russian Federation. 1993. "Law of the Russian Federation on Space Activity (June 20, 1993)," Art. 16, Para. 4. Internet. Available from http://www.jaxa.jp/jda/library/space-law/chapter_4/4-1-2-7/4-1-2-73_e.html; accessed 18 March 2005.
- ²⁹van Ballegoyen, Arjen F. 2000.
- ³⁰Shin Hongkyun. 2003.
- ³¹Tennen, Leslie I. 2003.
- ³²O'Donnell, Declan J. 2001. "United Societies in Space, Inc." Internet. Available from <http://www.angelfire.com/space/usis/oldsite.html>; accessed 6 May 2005.
- ³³Ibid.
- ³⁴Ibid.
- ³⁵Ibid.
- ³⁶Neureiter, Norman P. 2002. "Keynote Address to Space Policy Summit." Houston, Texas, 12 October 12. Internet. Available from <http://www.state.gov/g/oes/rls/rm/2002/14540.htm>; accessed 25 March 2005.
- ³⁷Brill, Kenneth. 2002. "Statement of Ambassador Kenneth Brill, Permanent Representative of the United States of America to the United Nations in Vienna." 41st session of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, Agenda Items 3-9 (April 2-12), Internet. Available from <http://www.state.gov/s/l/38716.htm>; accessed 24 March 2005.
- ³⁸Hodgkins, Kenneth. 2002. "Statement of Kenneth Hodgkins, U.S. Adviser to the Fifty-Seventh Session of the UN General Assembly, Statement in the Fourth Committee," New York, New York, October 9 Internet. Available from <http://www.state.gov/p/io/rls/rm/2002/14261.htm>; accessed 24 March 2005.
- ³⁹Wasser, Alan. 1997.
- ⁴⁰Silber, Kenneth. 1998. "A Little Bit of Heaven: Space-Based Commercial Property Development." Reason, November. Internet. Available from http://www.findarticles.com/p/articles/mi_m1568/is_n6_v30/ai_21231184; accessed 19 March 2005.
- ⁴¹Snider, John C. 2000. "SpaceDev Conquers the Universe!" Scifidimensions.com. Internet. Available from http://www.scifidimensions.com/May00/real_tech_spacedev.htm; accessed 29 March 2005.
- ⁴²Dinkin, Sam. 2004a. "Property Rights and Space Commercialization." Space Review, 10 May. Internet. Available from <http://www.thespacereview.com/article/141/1>; accessed 19 March 2005.
- ⁴³Dinkin, Sam. 2004b. "The Dinkin Commission Report (Part 1)." Space Review, 21 June. Internet. Available from <http://www.thespacereview.com/article/164/1>; accessed 19 March 2005.
- ⁴⁴Dinkin, Sam. 2004c. "Space Privatization: Road to Freedom." Space Review, 26 July. Internet. Available from <http://www.thespacereview.com/article/193/1>; accessed 19 March 2005.
- ⁴⁵Feeney, Tom. 2004. "Private Property and a Spacefaring People." Coalition for Property Rights, 22 July. Internet. Available from http://www.proprights.com/newsviews/display_newsletter.cfm?ID=96; accessed 19 March 2005.
- ⁴⁶Danilenko, Gennady M. 1989.
- ⁴⁷Goldman, Nathan C. 1988. p. 69.
- ⁴⁸Wikipedia. 2005. "Peremptory Norm." Internet. Available from http://en.wikipedia.org/wiki/Jus_cogens; accessed 3 July 2005.
- ⁴⁹Sackrey, Charles, and Geoffrey Schneider with Janet Knoedler. 2002. John Kenneth Galbraith and the theory of social balance. In Introduction to Political Economy, p. 132-156. Cambridge, Massachusetts. Economic Affairs Bureau, Inc.
- ⁵⁰Miller, Raymond. C. 2000. "Environmental Policy Implications of Clashing IPE Paradigms." Internet. Available from <http://bss.sfsu.edu/ir/irjournal/WinterSpring01/DrRaymondMiller.pdf>; accessed 3 July 2005.
- ⁵¹Dudley-Rowley, Marilyn. 2000. "The Globalization of Space." Pacific Sociological Association Annual Conference. San Francisco, California. 30-Mar-2001. Another version, "The Globalization of Space in the 21st Century: Implications for the National Aeronautics and Space Administration," was submitted to the Price Waterhouse Endowment for The Business of Government, \$15,000, January 2001-June 2001. Internet. Available from <http://www.ops-alaska.com/GlobalizationOfSpace/PacSoc.htm>; accessed 3 July 2005.
- ⁵²Dudley-Rowley, Marilyn, and Thomas Gangale. 2005. "Sustainability Issues of Long-Duration Exploration of the Moon and Mars." New Trends in Astrodynamics and Applications II, June 3. Princeton, New Jersey.
- ⁵³Wasser, Alan B. 2005. "Space Settlement Institute." Aerospace Architecture Forum, 5 March. Internet. Available from <http://www.spacearchitect.org/discussion/viewtopic.php?t=11#23>; accessed 3 July 2005.