January 1995

Making the Final Frontier Feasible: A Critical Look at the Current Body of Outer Space Law

Heidi Keefe

Follow this and additional works at: http://digitalcommons.law.scu.edu/chtlj

Part of the Law Commons

Recommended Citation
Available at: http://digitalcommons.law.scu.edu/chtlj/vol11/iss2/7
ESSAYS

MAKING THE FINAL FRONTIER FEASIBLE: A CRITICAL LOOK AT THE CURRENT BODY OF OUTER SPACE LAW

Heidi Keefe†

INTRODUCTION

Space law is the emerging field of law established to provide guidance and regulation over the exploration and use of outer space and all bodies found therein by persons on or from Earth. The current body of space law (corpus juris spatialis) is comprised of five principal agreements: the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of January 1967¹ (the Outer Space Treaty), the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of April 1968² (the Astronaut Agreement), the Convention on International Liability for Damage Caused by Space Objects of March 1972³ (the Liability Convention), the Convention on the Registration on Objects Launched into Outer Space of January 1975⁴ (the Registration Convention), and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies of December 1979⁵ (the Moon Agreement). Collectively, these treaties provide that space shall be free for all man-

kind to use in a peaceful manner. The theory behind the treaties is that all of mankind should benefit equally from what is found in outer space. The treaties were perhaps one of the first real attempts at establishing a global community that would work together to accomplish a goal. Space would not be divided up, as were the land masses on earth, through conquest and colonialism. Rather, the vision for space was one of humans working in harmony to better the lives of all mankind by exploring and possibly exploiting space resources for the good of all, in the spirit of cooperation and harmony.

The vision is good and the words are pretty ones, but the concepts have not been without their problems. As with many international agreements, there are ambiguities throughout the corpus juris spatialis. Technical problems are the easiest problems to notice with the treaties: key words are not clearly defined and provisions are lacking concerning legal aspects of settlements on celestial bodies (particularly the Moon and Mars). For example, consider the fact that among the words giving rise to difficulties due to lack of definition is the term “outer space” itself. All of the activities governed by the five treaties purport to deal exclusively with activities related to outer space, and yet none of the treaties define outer space. Customary international law seems to have firmly established that outer space is the area in which earth orbiting satellites move, and beyond. However, where do satellites move? While most satellites orbit the earth with perigees above 130 kilometers, there are a substantial number orbiting in the 110-130 kilometer range, and one satellite has been recorded as orbiting the earth with a low perigee of 96 kilometers. Arguably, anything 96 kilometers above the earth or more could be defined as outer space. However, more support remains for outer space existing above the 110-130 kilometer range, and it is certain that anything over 130 kilometers above the earth’s surface qualifies as outer space.

6. This is perhaps the single greatest problem with the treaties as they stand. Legal scholars have spilt quite a lot of ink on the issue, in fact an entire session of the Thirty-Fourth Colloquium on the Law of Outer Space of the International Institute of Space Law, of the International Astronautical Federation was dedicated to it. Definitional Issues in Space Law, in PROCEEDINGS OF THE THIRTY-FOURTH COLLOQUIUM ON LAW OF OUTER SPACE, 2-52, (1991) [hereinafter 34TH PROCEEDINGS].

7. Another session of the Thirty-Fourth Colloquium of the Law of Outer Space was devoted solely to “Legal Aspects of Settlements on the Moon and Mars.” Id. at 53-114.


lite orbits the earth might decrease, subsequently broadening the regime of outer space, and narrowing the jurisdiction currently known as airspace. This is but one of the complicated technical problems which currently plague the field of space law.

However, the technical problems, while difficult to solve, are not as drastic or injurious to the progress of space exploration and exploitation as the problems which exist behind the space treaties. As mentioned above, the corpus juris spatialis envisions a new world order. The articles of the various treaties all predicate themselves upon the theory that mankind will work together for the common good with no real advantage to be gained other than the praise of his fellow man. It assumes that people are able to co-operate, and that they will indeed do so whenever dealing with outer space ventures. While a global effort in researching, developing and exploring space for the sheer joy of the information obtained, accomplished in the spirit of teamwork is a noble goal, it is clear that a world full of economic strife is ripe to intervene.

None of the treaties really take into account the human need to be fairly certain of the task required, and to be rewarded for what is accomplished, which may be the downfall of the current corpus juris spatialis. Without incentive, most individuals will not grow beyond what is absolutely necessary in their lives. The capitalist (or pseudo-capitalist) notions that dominate the economics of the developed world attempt to provide reward based on individual effort. Through this system of rewards for successes, we are ingrained with the notion that there is always an underlying reason for everything that we do. The underlying reason—always ends up being money.

The current space program is facing some potentially lucrative prospects, yet the costs of establishing the initial venture are staggering. Aside from the unrealized possibility of extracting resources from the Moon or other celestial bodies, possible technological advancements exist today. Crystals grown in space show great potential. For example, Gallium Arsenide (GaAs) semiconductors are estimated to be eight times faster than standard chips, and use one-tenth the power.10 "These binary crystals are more difficult to make of Earth than traditional single crystal silicon chips, because their electrical performance is greatly reduced by contaminating atoms that cannot be eliminated in the low vacuum levels attainable on Earth. They cannot be made pure enough here."11 These crystals can, though, be grown in

11. Id.
space, as well as protein crystals used in drug research and creation.\textsuperscript{12} New alloys can also be created in space that are not available on Earth.\textsuperscript{13} All of the preceding are opportunities for technological advancement which carry with them investment and growth potential for space programs everywhere. They all also carry high price tags though,\textsuperscript{14} and are inhibited by the existing \textit{corpus juris spatialis}. Projects which lose money in today’s economy are deemed failures due to the fact that an end reward is difficult if not impossible to realize, consequently lose funding and are eventually canceled. Without some careful planning now, this may be the fate of both government and private space programs throughout the world.


Due to the fact that this essay proposes that one of the gravest problems with the current regime of Space Law lies within the theories upon which the various international instruments are predicated, it is necessary to look in detail specifically at the bodies of the two agreements which discuss the sovereignty and exploitation of resources issues: the Outer Space Treaty,\textsuperscript{15} and the Moon Agreement.\textsuperscript{16}

Historically, there was no need to extend the realm of legal regulation beyond the planet. In 1957, however, the first artificial satellite, built by the Soviet Union, successfully orbited the Earth, formally ushering in the era of space exploration, informally beginning the space race between the Soviets and Americans.\textsuperscript{17} Seeing the need for future regulation in the outer space arena, the United Nations acted immediately by establishing an \textit{ad hoc} committee to review the problems of space law.\textsuperscript{18} Among the committee’s first problems were issues of membership.\textsuperscript{19} The USSR, the only country to have successfully launched an artificial satellite, Czechoslovakia, Poland, India and the United Arab Republic all refused to participate due to the fact that they were “dissatisfied with the composition of the \textit{Ad Hoc Commit-
The Committee produced a report in 1959, but the future of international space law was still uncertain and progress was essentially stalled until 1961. In 1961, the issues of Space Law were put before the General Assembly of the United Nations. Resolution 1721 (XVI) was drafted delineating the General Assembly’s opinion regarding some of the desired elements to be addressed in a space law treaty. General Assembly Resolutions 1884 (XVIII) and 1962 (XVIII) followed. The work of the previous three Resolutions culminated in the eventual formation of the Outer Space Treaty of 1967. Multilateral treaties followed the Outer Space Treaty as new issues of space law became important, culminating with the controversial Moon Agreement in 1979. However, none of these subsequent treaties changed the basic tenor set by the first treaty. Space was to be an international venture, with no real profit for any nation or person. Herein arises the problem, for as we have established there is generally a human need to be rewarded for ventures undertaken. It is important to review the provisions in the existing treaties which deal specifically with what one might “get for going out there” in order to determine whether or not new incentives may be easily effectuated.

A. The Outer Space Treaty of 1967

The Outer Space Treaty (OST) of 1967 is the cornerstone of all space law. It was the United Nation’s first attempt to establish guidelines for human activities in outer space. The treaty encompassed many of the ideas set forth in the General Assembly Resolutions men-
tioned above. Incorporation of the Resolutions was seen as necessary as they had all been adopted unanimously. The treaty itself was also widely accepted.

The treaty is written very broadly. Article 1 provides that: "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 or scientific development, and shall be the province of all mankind." Article 1 goes on to provide that outer space "shall be free for exploration and use be all States," and concludes by promoting notions of co-operation in space efforts. Furthering the theory of co-operation and freedom, the problematic non-sovereignty clause of the Treaty is found in Article 2, forbidding national appropriation of outer space. The theory that outer space should benefit all mankind is furthered through Article 4, the "no weapons" clause of the Treaty, which insists that all uses of outer space be peaceful ones, and that "no nuclear weapons, or any other kinds of weapons of mass destruction" be stationed anywhere in outer space.

The international nature of the Outer Space Treaty is evident in the vast majority of its provisions. Articles 1, 2 and 4, which have already been described, have clearly been written with an eye to international application. Articles 3 and 6 delineate the involvement of international law under the treaty, with the former detailing the requirement that all activities be carried out in accordance with interna-

---

30. Resolution 1884 basically is reworded in paragraph I of Article 4 of the Outer Space Treaty, while the other Resolutions form the basis of Articles 1-3 and 5-9. Outer Space Treaty, supra note 1, arts. 1-4 and 5-9.

31. Author's note: Unanimous approval of the Resolutions was rather a coup for the United Nations considering the Cold War tensions existing between the only two countries to have space capabilities at that time: the United States of America (USA) and the Soviet Union (USSR). See Christol, infra note 109, and accompanying text.

32. SPACE LAW: SELECTED BASIC DOCUMENTS SECOND EDITION, 95TH CONG., 2D SESS., COMM. ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE 34-36 (Comm. Print 1978).

33. Author's note: This portion of the article was clearly included to allay the fears of developing nations that the great "Space race" would result in the same time of conquest by the mighty that defined the early exploration of our own world. It was important enough to the developed nations to have their space programs launch, that this compromise was not seen as a great one. See generally Christol, infra note 109.

34. Outer Space Treaty, supra note 1, art. 1.

35. Id.

36. See discussion infra parts II.A., III.A.

37. Outer Space Treaty, supra note 1, at art. 2.

38. Id. at art. 4.
tional law, and the latter requiring international responsibility for national activities undertaken in outer space.\textsuperscript{39}

The international tenor of the treaty is extended through the large number of Articles promoting the spirit of co-operation in all outer space ventures. Articles 9-11 all use the word co-operation,\textsuperscript{40} and Article 12 discusses reciprocity, which by definition entails complete cooperation. Article 9 requires all states conducting activities in outer space to act “with due regard to the corresponding interests of all other States Parties\textsuperscript{41} to the Treaty.” Article 10 goes on to promote co-operation by requiring States Parties the Treaty to consider affording other State Parties “an opportunity to observe the flight of Space objects launched by those States.”\textsuperscript{42} The consideration is tempered by the caveat that all such agreements to allow launch viewing “shall be determined by agreement between the States concerned.”\textsuperscript{43} While Article 10 attempts to deal with information sharing at the beginning of an activity to be conducted in Outer Space, Article 11 is the vehicle by which information concerning the results of the activities is to be shared with the international community by requiring State Parties to “agree to inform . . . to the greatest extent feasible and practicable, of the nature, conduct, locations and result of such activities.”\textsuperscript{44} Lastly, the reciprocity criterion of Article 12 concerning “all stations, installations, equipment and space vehicles on the moon and other celestial bodies” should be binding.

\begin{footnotesize}
\begin{enumerate}
\item Id. at arts. 3 and 6.
\item "In the exploration and use of outer space . . . Parties . . . shall be guided by the principle of co-operation and mutual assistance . . . ." Id. art. 9. “In order to promote international co-operation . . . Parties . . . shall consider . . . requests . . . to be afforded an opportunity to observe the flight of space objects . . . .” Id., art. 10. “In order to promote international co-operation . . . Parties . . . agree to inform . . . of the nature, conduct, locations and results of such activities.” Id. art. 11.
\item Author’s note: For American readers, it is perhaps best to clarify that States Parties is used to refer to all Nations who are parties to the treaty in question. States is used in international law to signify nation-states. See generally D.J. Harris, Cases and Materials on International Law, 102-172 (1991).
\item Outer Space Treaty, supra note 1, art. 9.
\item Id. art. 10.
\item While the OST is clearly attempting to promote international sharing of scientific advances in the form of launches and/or equipment launched, they seemingly realized that the two space powers at the time, the US and USSR, would not be willing to relinquish complete control over launch viewings. Article 4 effectively withdrew outer space from becoming the next global warfare arena, but there could still be many military or otherwise secret launches that could be realized under the treaty, i.e. surveillance satellites. The caveat at the end of Article 10, then, would seem to have been required to mollify the possible secret, but legal, interests of the Superpowers. Id.
\item Id. art. 11. Again, the caveat “feasible and practicable” has the effect of allowing the State Party involved in the outer space activity to withhold information obtained if the State determines it not to be “practicable”: e.g. surely it would not be practicable to release all of the information obtained via surveillance satellites.
\end{enumerate}
\end{footnotesize}
bodies also promotes the spirit of co-operation, though it may be a somewhat forced co-operation.

The remaining Articles of the Treaty are the necessary application segments, discussing to whom the Treaty applies, how questions concerning the activities of international organizations shall be resolved, how and when the treaty will enter into force, the possibility and procedure for withdrawal from the Treaty, and the languages in which the Treaty shall be written. Most important to this analysis, there is also an Amendment provision in the Treaty. Article 15 provides:

Any State Party to the Treaty may propose amendments to this Treaty. Amendments shall enter into force for each State Party to the Treaty accepting the amendments upon their acceptance by a majority of the States Parties to the Treaty, and thereafter for each remaining State Party to the Treaty on the date of acceptance by it.

The Outer Space Treaty opened for signature at Washington, London and Moscow January 27, 1967, and entered into force October 10, 1967. There are currently 91 States who are parties to the Treaty. There is also a widely accepted notion that the treaty now

46. Id. at art. 12.
47. Author's note: Article 12 is conspicuously drafted only to require reciprocity on the moon and other celestial bodies, the question is then begged, what form of co-operation is required in orbiting space stations or other vehicles, installations, etc. which are not established on the "moon or other celestial bodies"? Id. Theoretically, the same notions of co-operation would be expected therein, but an equally plausible argument could be made that non-stationary installations were not included for a reason, and therefore are not subject to reciprocity requirements. This is yet another of the possible complications which may arise with the Treaty in the near future (if/when both the Mir and Freedom space stations occupy outer space).
48. "The provisions of this Treaty shall apply to the activities of States Parties to the Treaty in the exploration and use of outer space, including the moon and other celestial bodies, whether ... carried on by a single State Party ... or jointly with other States ..." Outer Space Treaty, supra note 1, at art. 13.
49. "... shall be resolved by the States Parties to the Treaty either with the appropriate international organization or with one or more States members of that international organization, which are Parties to this Treaty." Id.
50. "(2)This Treaty shall be subject to ratification by signatory States ... (3)This Treaty shall enter into force upon the deposit of instruments of ratification by five Governments." Id. at art. 14.
51. "Any State Party may give notice of its withdrawal from the Treaty one year after its entry into force ... withdrawal shall take effect one year from the date of receipt of this notification." Id. at art. 16.
52. "This Treaty, of which the English, Russian, French, Spanish and Chinese texts are equally authentic, shall be deposited in the archives of the Depository Governments." Id. at art. 17.
53. Outer Space Treaty, supra note 1, at art. 15.
54. SPACE LAW, supra note 32, at 34.
55. HARRIS, supra note 41, at 222 n. 59.
constitutes customary international law.\textsuperscript{56} However, the Treaty is subject to change by amendment, and customary international law is subject to change as circumstances dictate.

B. The Moon Agreement of 1979

In 1971 the USSR suggested to the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) that an agreement related to the Moon needed to be considered.\textsuperscript{57} A draft of such an agreement was finalized by COPUOS in 1979.\textsuperscript{58} Many of the articles in the Moon Agreement were simply reiterations or rewordings of Articles found in the original Outer Space Treaty, but there were many new additions warranting the annexation of the Moon Agreement to the existing corpus juris spatialis.

The Moon Agreement begins differently than the Outer Space Treaty, by defining the extent of the Agreement’s coverage as the moon and “other celestial bodies within the solar system, other than the earth...[or] materials which reach the surface of the earth by natural means.”\textsuperscript{59} The next few articles echo provisions found in the 1967 Treaty. Article 2 of the Agreement, like Article 3 of the Outer Space Treaty\textsuperscript{60} mandates the application of international law to all activities undertaken on the Moon.\textsuperscript{61} The parallel continues through Article 3 of the Agreement, mirroring the language of Article 4 of the Outer Space Treaty by mandating all uses “by all States Parties exclusively for peaceful purposes,” by prohibiting “nuclear weapons or any other kinds of weapons of mass destruction,” and by forbidding “the establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres...”\textsuperscript{62} Article 4 of the Moon Agreement reiterates the theories of co-operation found in the Outer Space Treaty by once again declaring that all “exploration and use of the moon shall be the province of all mankind and shall be carried out for the benefit...of all countries.”\textsuperscript{63}

Article 5 begins as its counterpart in the Outer Space Treaty,\textsuperscript{64} requiring States Parties to inform, to the greatest extent feasible and

56. See generally Cheng, supra note 9.
58. Id.
59. Moon Agreement, supra note 5, at art. 1.
60. Outer Space Treaty, supra note 1, at art. 3.
61. Moon Agreement, supra note 5, at art. 2.
62. Id., art. 3. Outer Space Treaty, supra note 1, at art. 4.
63. Moon Agreement, supra note 5, at art. 4.
64. Outer Space Treaty, supra note 1, at art. 11.
practicable, of their activities. The Agreement provision goes beyond its counterpart, though, to delineate time frames for reports, and places an absolute requirement for States Parties to "promptly inform ... the public and the international scientific community, of any phenomena they discover in outer space ... which could endanger human life or health, as well as of any indication of organic life." Likewise, Article 6 starts and ends as a repeat of ideals previously established, promoting co-operation and declaring freedom of scientific investigation, but the Moon Agreement shifts its focus in paragraph 2 and establishes an important new principal. During scientific investigations on the Moon, "Parties shall have the right to collect on and remove from the moon samples of its mineral and other substances. Such samples shall remain at the disposal of those States which caused them to be collected and may be used by them for scientific purposes." This is the first time any of the treaties have allowed any State Party to retain control over anything that it finds in outer space, but it still steers clear of allowing the word "own" to creep into the Agreement. The Party is allowed only to use the sample for limited purposes.

Articles 7, 8 and 9 are all relatively new, with minor exceptions, as they deal specifically with the activities of persons on the moon. Moon activities are supposed to avoid disruption of the existing environmental balance and the earth is to be protected from the introduction of matter that might harm its environment. All of these activities are subject to review by the Secretary-General of the United Nations. From reports concerning activities conducted on the moon and other bodies, consideration shall be given to areas which may benefit from being designated as international scientific preserves. In order to further moon activities, Article 8 allows for the exploration and use of the Moon, in terms of launches of space objects, and placement of personnel, craft, stations or installations both on the surface and below it, where they are to be afforded freedom of movement. Provisions for the establishment of manned stations are then made in Article 9, which allows for stations which take up no more area than is absolutely required of them, so long as they do not impede access to

65. Moon Agreement, supra note 5, at art. 5.
66. Id., art. 6, ¶ 1. Outer Space Treaty, supra note 1, at arts. 1 and 3.
67. Moon Agreement, supra note 5, at art. 6, ¶ 2.
68. Id. at art. 7.
69. Id.
70. Id.
71. Id. at art. 8.
the body for others, in accord with Article 1 of the Outer Space Treaty.\footnote{72}

The individuals who go into outer space are not mentioned specifically until Article 10, where it is stated that they shall be protected and safeguarded. For the purposes of the Agreement, all persons on the moon are to be considered astronauts.\footnote{73} As such, the standard to be applied stems from Article 5 of the Outer Space Treaty,\footnote{74} and the required treatment of spacecraft personnel from the Astronaut Agreement.\footnote{75}

Articles 12 and 13 concern things which are sent up into outer space by persons on the earth. Article 12 reflects the Outer Space Treaty in paragraph 1, providing that the country of origin retains jurisdiction over all things and personnel which it sends up to the moon.\footnote{76} Things found in areas “other than their intended location” are dealt with in accordance with Article 5 of the Astronaut Agreement,\footnote{77} and emergencies dictate that all persons may use all equipment they deem necessary at the time.\footnote{78} Lastly, as regards “lost items”, if there is a crash or forced landing, the launching State shall be notified of the whereabouts if some other State Party is aware of it.\footnote{79}

The most major change though in outer space law regarding the moon and other celestial bodies relates to possible exploitation of non-earth bodies. This change is embodied in Article 11, arguably the keystone of the controversy surrounding the Moon Agreement. Article 11 proposes that “the moon and its natural resources are the common heritage of mankind . . . not subject to national appropriation,”\footnote{80} and rights to explore are given without discrimination.\footnote{81} The article goes on to state 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.\footnote{82} Herein lies a grand potential problem of ambiguity with which the international community has still not dealt.

\begin{footnotes}
\footnotetext[72]{Moon Agreement, supra note 5, at art. 9.}
\footnotetext[73]{Id. at art. 10.}
\footnotetext[74]{Outer Space Treaty, supra note 1, at art. 5.}
\footnotetext[75]{Astronaut Agreement, supra note 2, at arts. 2, 3 and 4.}
\footnotetext[76]{Moon Agreement, supra note 5, at art. 12, ¶ 1. Outer Space Treaty, supra note 1, at art. 8.}
\footnotetext[77]{Moon Agreement, supra note 5, at art. 12, ¶ 2. Astronaut Agreement, supra note 2, at art. 5.}
\footnotetext[78]{Moon Agreement, supra note 5, at art. 12, ¶ 3.}
\footnotetext[79]{Id. at art. 13.}
\footnotetext[80]{Id. at art. 11, ¶ 1 and 2.}
\footnotetext[81]{Id. at art. 11, ¶ 4. There is no change here really from the norms established by the OST.}
\footnotetext[82]{Id. at art. 11, ¶ 3 (emphasis added). This is where the change takes place.}
\end{footnotes}
Countries like the U.S. have argued strenuously that such language allows for exploitation of moon minerals. There are, they accede, no claims of sovereignty, and therefore no possible sales of what one does not own, in the minerals “in place”. However, they argue, once the minerals are extracted from the surface or subsurface of the extraterrestrial body, they become the property of the extractor and are then available for sale or use by the extractor as his/her/its personal property.

The next controversy arises with paragraphs 5 through 8 of Article 11, which provide that the exploitation of resources on the moon shall be governed by an international regime which will manage all resources and see that they are equitably shared by all State Parties. The problem is that the regime is not set up by the Agreement, only the fact that a regime shall exist in the future. No provisions are specified for the time between implementation of the Agreement and the setting up of the regime.

The Agreement then resumes somewhat more average discussions of moon activities. It should be no surprise then, that liability for problems arising during activities on the moon are dictated international responsibility, and the Liability Convention. What is a bit surprising is that all States Parties to the Agreement are also given the right to “check up” on the activities of other States on the moon. If problems arise, provisions are then made in Article 15 paragraphs 2 and 3 for consultations and dispute resolutions.

Article 18, also a unique provision of the Agreement, provides that ten years after the entry into force of the Agreement, a review conference shall be convened. The conference shall “consider the question of the implementation of the provisions of Article 11, paragraph 5.” In other words, they will meet in order to determine exactly what type of regime would be appropriate under the circumstances existing at the time that the regime was established, including, but not limited to, technological developments.

---

83. Moon Agreement, supra note 5, at art. 11, ¶¶ 5-8.
84. Id. at ¶ 5.
86. Moon Agreement, supra note 5, at art. 15, ¶ 1.
87. Id. at art. 15, ¶¶ 2 and 3.
88. Id. at art. 18.
89. Author's note: The time frame for this review has come and gone. The treaty entered into force in 1984, 10 years later was July of 1994, but no meeting was held. See supra notes 136-138 and accompanying text.
Finally, the technical aspects of the Agreement are set out in Articles 17 and 19 through 21, describing amendment procedures,\footnote{Moon Agreement, supra note 5, at art. 17. This provision mirrors the amendment process established in the Outer Space Treaty. Outer Space Treaty, supra note 1, at art. 15.} ratification process, entry into force,\footnote{Moon Agreement, supra note 5, at art. 19.} withdrawal possibilities,\footnote{Id. at art. 20.} and the deposit of the texts.\footnote{Id. at art. 21.}

The Moon Agreement entered into force July 11, 1984, having received 5 ratifications.\footnote{See Tanja L. Masson-Zwaan and Walter W.C. de Vries, The Establishment of a Legal Regime for the Exploration of the Natural Resources of the Moon and Other Celestial Bodies: When and How?, in 34TH PROCEEDINGS, supra note 6, at 257.} To date, seven countries have ratified the instrument.\footnote{Id.} However, no States having space capabilities, save two, have in fact ratified the Agreement or incorporated it as part of their domestic law.\footnote{Id.} The Agreement was argued over for eight years, and tentative consensus was reached within COPUOS that this was an Agreement which would be acceptable.\footnote{David S. Myers, The Moon Treaty in Legal and Political Perspective, in 23RD PROCEEDINGS, supra note 57, at 49.} However, in reality, "[a]lthough sufficient consensus was achieved to finalize the treaty, the considerable ambiguity that remains will in all probability produce tensions in the future."\footnote{Id. at art. 21.} Without further resolution of these ambiguities (i.e. the meaning of "in place" in Article 11), there is likely to be no further development or acceptance of the Moon Agreement beyond its current limited scope.

II. Why might the existing provisions in the Outer Space Treaty and the Moon Agreement prove problematic?

The existing agreements regarding the exploration and use of outer space are all based on a theory of international co-operation and benefit to all mankind.\footnote{The exceptions are France and India, who are signatories, but have not yet ratified the instrument. Id.} The original Outer Space Treaty laid down the broad principals to be applied in the exploration of outer space, and has not been amended since. The treaty though, as with all of the agreements regarding outer space, has not been without its criticism. Harry Almond, Professor of International Law at the National Defense University in Washington D.C. criticizes the Treaty language by claiming that "these principles though helpful as markers aimed at future policy, are insufficient in scope, ineffective for control, and un-
availing for implementation and enforcement for the purposes of regulation." Almond is not alone in his criticism of the Outer Space Treaty. In each volume of the International Institute of Space Law of the International Astronautical Federation’s Colloquium on the Law of Outer Space Series, there is at least one article discussing problems, be they definitional, theoretical, or practical with the Treaty. However, the Treaty has survived all criticism and has not been amended.

A. The preclusion of sovereignty or ownership in outer space presents problems to the future of space development

The Outer Space Treaty, serving as the cornerstone of the existing corpus juris spatialis is the first and principle instrument to eliminate all possibilities of national sovereignty in outer space with the broad language of Article 2: “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.” The language of the article clearly precludes any possibility of the colonialism that dictated the history of planetary exploration and expansion beginning in the fifteenth century. However, the Article is conspicuously limited to states, referring only to “national appropriation” Upon first glance one might assert that the Article may be circumvented by simply owning the outer space territory as an individual, not as a nation. Thus, John Smith could own a piece of the Moon while the United States would be precluded from calling the same piece an extension of the United States. Unfortunately, this ambiguity has never been clarified.

Taken literally, individuals, by not being specifically mentioned in the treaty, are free to act on their own behalf. Professor S. Gorove, Vice-President of the International Institute of Space Law, interpreting the treaty once wrote “at present, an individual acting on his own behalf or on behalf of another individual or a private association or an international organization could lawfully appropriate any part of outer space” 104

101. See, e.g., 34TH PROCEEDINGS, supra note 6; 35TH PROCEEDINGS, supra note 8.
102. See e.g., Vladimir Kopal, Issues Involved in Defining Outer Space, Space Object, and Space Debris, in 34TH PROCEEDINGS, supra note 6, at 38; José Monserrat Filho, About the Legal Definition of International Cooperation in the Exploration and Use of Outer Space, in 35TH PROCEEDINGS, supra note 8, at 355.
103. To which all current space powers are bound as State Parties. SPACE LAW, supra note 32 and accompanying text.
104. Outer Space Treaty, supra note 1, at art. 2.
105. Id.
space..." Literalists have also argued that precluding sovereignty and forbidding individuals from owning portions of outer space violates the fundamental human rights of those who would choose to settle on the moon or other celestial body. Specifically cited are Articles 15 and 17 of the Universal Declaration of Human Rights, which provide respectively, that "everyone has the right to a nationality; [and] everyone has the right to own property alone as well as in association with others." The literalist approach is not popular because it is not always compatible with the intent behind the words found in the treaty at the time of drafting. In order to determine whether or not the words of Article 2 meant to exclude individual appropriation as well, it is helpful to look to the negotiating history behind the treaty itself.

Professor Carl Christol boldly states, "[t]he negotiating history of Article 2 ... offers a sound basis for the view that [it] ... was designed to impose the same limitations on juridical and natural persons." Christol goes on to explain that it is actually the words "by any other means" at the end of Article 2 which extend the limitations imposed by the Article to individuals as well as international or intergovernmental organizations. The first, and perhaps most persuasive argument is that all persons of the earth, whether juridical (corporations, organizations) or natural, are subject to some national jurisdiction and control. Consequently, they are extensions of the States Parties to the treaty, and can not accomplish independently that which the States are prevented from doing.

Being prevented from claiming sovereignty and exclusive property rights located in the space environment for themselves, it will be argued that States are also prohibited from granting quasi-sovereign and exclusive property rights over such areas and resources to those natural and juridical persons which are subject to national jurisdiction and control which are created through international agreements.

Thus, states are prohibited from asserting sovereignty "by the means" of utilizing non-state entities to accomplish their goals.

110. Id. at 263.
111. Id. at 221.
The second argument rests on the theory that the world leaders who had convened for the formation of the Outer Space Treaty all supported the view that the space environment was to be governed by the *res communitis* principle, allowing no sovereignty, regardless the method utilized.112 This principle would allow for the widest access to outer space available to promote exploration, use and exploitation under the umbrella of international co-operation and mutual assistance. This theory is supported by documents submitted by the various participants in the negotiations as well as articles written by contemporary legal scholars.113 The British representative to the conference was quite specific: "While no reference was made to . . . international organizations, that was not intended to mean that the principles which would govern the conduct of States would not also apply to such organizations."114 No contradiction was made to the British representative’s comments, and his draft proposal was followed by similar drafts by the United States and the Soviets.115

The first Article of the Outer Space Treaty also bolsters the theory that Article 2 was intended to apply to entities other than states.116 Article 1 mandates that all outer space shall be free for use and exploration by all.117 Allowing certain persons or organizations to exercise sovereignty or ownership over outer space would undermine the rule imposed in Article 1. It then seems quite clear that the words in Article 2 were intended to apply to all states and persons, juridical or natural, precluding the possibility of sovereignty in outer space.

If any doubts remained concerning ownership, as opposed to sovereignty, they were dismissed with the drafting of the Moon Agreement of 1979. The wording of the Agreement, this time, is very clear. Article 11 first states that "[t]he moon is not subject to national appropriation."118 It goes on to provide "[n]either the surface, nor the sub-surface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization, or non-governmental entity or any natural person."119 While the Moon Agreement is not yet applicable to the major space powers, it is nonetheless an

---

112. Id. at 224-239.
113. Id.
115. The United Arab Republic also filed a similar draft. Christol, supra note 109, at 228.
116. See generally Id.
117. Outer Space Treaty, supra note 1, at art. 1.
118. Moon Agreement, supra note 5, at art. 11, ¶ 2.
119. Id. at ¶ 3.
important part of the *corpus juris spatialis*, and the intent to preclude ownership of outer space property is clear. We are left then with one rule regarding outer space property, “to share and not to monopolize no matter by whom or by what means such claims may be asserted.”

Having determined that the treaty and subsequent agreements intended to preclude all sovereignty and ownership in outer space, by states, natural or juridical persons, we are still left with a major problem. The problem is how to maintain the interest and investment of the individuals and states on the earth who have the power and resources to explore space without being able to guarantee them a stable environment in which to establish settlements on the moon or other celestial body. Ownership and sovereignty accomplish similar purposes in the modern world. They both provide a sense of security. The security lies in the knowledge that the land under the home, factory, or school that is built will not be yanked out from under the establishment in favor of someone else’s idea of what should be done with the area involved. Settlers on the moon or other celestial bodies are then left with the question posed by Professor Esquivel de Cocca in his 1992 article: “In the absence of sovereignty and of jurisdiction and a control authority, who leads and maintains order within the settlement?” Without order, chaos reigns, and where chaos reigns, investors and new settlers are not likely to follow. Thus, the future of space exploration and settlement depend on forming provisions to be added to the *corpus juris spatialis* that will provide a measure of security to the investors and settlers who embark on journeys of exploration beyond current earth borders.

### B. The lack of an established, profitable regime for controlling the exploitation of resources on celestial bodies poses a substantial barrier to the furtherance of outer space development

In the modern world, in order for States or private organizations/persons to invest time and resources in a venture, there must be some

---

120. Christol, *supra* note 109, at 263.

121. “[S]overeign states have monopolized activities in space exploration since the beginning of space age. The reason for such states’ monopoly of space exploration is attributed to high costs of the endeavors and military interest in space technology.” Charles Chukwuma Okolie, *International Law Principle of Jurisdiction in Regard to Settlements of Humankind on the Moon and Mars*, in *34th Proceedings, supra* note 6, at 64-65.


guarantee of a future return on the initial investment. As far as outer
space is concerned, one of the largest potential areas of development
involves the exploitation of natural resources occurring in or on the
moon, and other planets and asteroids. It has so far been determined
that there exists in outer space, at the very minimum: aluminum, cal-
cium, carbon, chromium, gold, hydrogen, iridium, iron, magnesium,
manganese, nickel, nitrogen, oxygen, platinum, silicon, titanium, and
water. Most of the rarer metals have been identified with asteroids
which orbit the sun in a plane between Mars and Jupiter. The aster-
oid field contains anywhere from $10^4$ to $10^6$ asteroids. Clearly then,
the mining of asteroids, or the moon or Mars would yield elements
currently needed and used here on earth. Such a venture would there-
fore be beneficial to mankind, and should be undertaken if feasible.
However, feasibility is where the problem emerges concerning the ex-
ploration of outer space resources.

In order for ventures to be feasible in today’s society, they must
also be profitable. The technology and resources necessary to realize
potential outer space exploitation, while not insurmountable are cer-
tainly prohibitive. No exact figures are available at this time for the
cost of mounting an expedition to mine an asteroid, but an analogy can
be drawn to the mining of the deep-sea bed.

---

124. See Masson-Zwaan, supra note 94; William J. Kaufmann, Universe 322-330
(1988); Frank H. Shu, The Physical Universe: An Introduction to Astronomy 420
(1982).
125. Kaufmann, supra note 124.
126. Shu, supra note 124.
127. Costs of a similar venture undertaken at the bottom of the ocean to recover manganese
nodules have been reported by J.R.V. Prescott as follows (in millions):

Research and development of a mining, transport and processing system + Search for
appropriate site: $172
Ships equipped to properly mine the nodules: $294
Operating cost of ships (per year): $68
Support equipment to transport nodules to the shore after mining (i.e., helicopters): $174
Operating costs of support equipment (per year): $21
Port facilities for discharge and storage of cargo: $30
Annual port fees: $3
Land transport system to carry nodules to the processing plant: $40
Recurring annual fees for land transport $7
Plant to extract minerals from nodules: $458
Annual plant operating costs: $100
Waste disposition from extraction process: $22
Annual costs of waste disposal: $7
Additional support charges: $1
Recurring support fees: $16

Grand Totals: Initial investment= $1.191 Billion
Annual Recurring Costs= $222 Million

It has been proposed that the extraction of minerals on the moon or other celestial body may be easier and less costly than the mining of the deep-sea bed, thus lowering some of the annual recurring costs. However, this number can be offset by the higher cost of developing technology and ships capable of traveling to outer space to mine the elements, and those capable of returning with the marketable product. For example, the Space Shuttle Endeavor, which replaced Challenger in 1991, was estimated to have cost in the neighborhood of $2 billion. The cost of a new toilet alone has been reported at $23 million. Some sources have estimated that the cost of putting a pound of material into orbit is nearly $3,500. Clearly then, one can see that the costs of establishing and maintaining a program which exploits the resources in outer space will be prohibitively expensive. The capital required will be difficult to raise even with assurances of returns on investments. Without such assurances, the funding will be nearly impossible to obtain, and outer space resources will remain unexploited and unexploitable.

The current regime of outer space law concerning the exploitation of resources is dictated principally by Article 2 of the Outer Space Treaty, and Article 11 of the Moon Agreement. Article 2, as discussed above, precludes sovereignty over outer space, while Article 11, paragraph 3 forbids the ownership of the “surface [or] the subsurface of the moon...or natural resources in place.” The issue of sovereignty and ownership becomes important to developers of resource extraction schemes concerning the amount of control they are given to exclude others from usurping their claims or capitalizing on areas already selected for exploitation but not yet processed. Without the possibility of ownership or sovereignty rights, persons, groups or states who might have once been interested in developing schemes to mine the moon will become wary of undertaking the extremely expensive venture due to the lack of security in their mining areas.

132. It is also estimated that the cost of an average shuttle flight is between $300-400 million, certainly prohibitive. *Science: The Hubble Mission-The Fourth Day-Part 3* (CNN television broadcast, 1:56 a.m. ET, Dec. 8, 1993).
133. See discussion *supra* part II.A.
135. See discussion *supra* part II.A. and discussion *infra* part III.A. relative to the fears implanted due to the instability flowing from a lack of sovereignty or ownership.
Assuming the problem of land security can be solved, there is still one major problem to be overcome concerning resource extraction in outer space. Arguably, under the current *corpus juris spatialis*, there is simply not enough incentive or structure provided to developers concerning the extraction process to make it a profitable, and therefore attractive one. As discussed above, the current *corpus* discusses the extraction of resources in Article 11, paragraph 5 of the Moon Treaty. The section explicitly reads: “States parties to this Agreement hereby undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible. This provision shall be implemented in accordance with Article 18 of this Agreement.”

Article 18 goes on to state:

Ten years after the entry into force of this Agreement, the question of the review of the Agreement shall be included in the provisional agenda of the United Nations General Assembly in order to consider, in the light of past application of the Agreement, whether it requires revision... A review conference shall also consider the question of the implementation of the provisions of article 11, paragraph 5.

On July 11, 1994, that date came and went. Considering that only seven states have as yet become parties to that Agreement, and considering also the recent acceptance of a similar regime governing the Deep-Seabed in Part X of the Law of the Sea Convention, it is perhaps indeed time to have that review, in order to formulate proposals for a more successful future for the Moon Agreement, paying special attention to the interests of future investors in outer space resources.

As mentioned above, one of the principle problems with the existing treaty is that it does not establish an international regime, but rather calls for one to be set up by the States Parties to the Agreement. Consequently, investors are left with little or no direction to follow in planning their outer space ventures. Paragraph 7 of Article 11, sets forth some of the purposes of the regime that will be set up by the States Parties as: “The orderly and safe development of the natural resources...; The rational management of those resources; The ex-

---

136. Moon Agreement, *supra* note 4, at art.11.
137. *Id.* at art. 18.
pansion of opportunities in the use of those resources." These all seem to be reasonable goals for an international regime governing the exploitation of resources. The last portion of the Article is where investors begin to question the workability of the Moon Agreement. Part (d) proclaims that there will be: "[a]n equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries which have contributed either directly or indirectly to the exploration of the moon, shall be given special consideration." The provisions in the preceding section are vague, at best, not only in the manner in which the regime will regulate that which is found on the moon, but in what exactly will be distributed, and how. The Agreement calls for distribution only of the benefits, not of the resources themselves. Does "benefits" mean profits, energy obtained, and/or knowledge? As to distribution, the call is for equitable dispersal, not equal. Who is to determine the equity, and is there an appeal process if the decision is not favored by all States Parties involved?

The net result is that the current corpus of space law provides neither guidance nor incentive for those interested in investing in outer space exploration and exploitation. At the heart of the problem is the Moon Agreement of 1979, which effectively skirts the very issues that the treaty was established to solve. No provisions are made to solidify the procedure that will be followed when moon mining begins. "The negative experience of the Article XI of the Moon Agreement shows how difficult it is to find legal formulae taking these opposing considerations into account. Basically, political decisions concerning international economic relations are at stake here." Yet, while difficult to draft regime provisions acceptable to all, it should not be impossible, and is in fact necessary to the future development of outer space exploration and the exploitation of resources on the moon and other celestial bodies.

139. Moon Agreement, supra note 4, at art. 11, ¶ 7, §§ a-c.
140. Id. § d.
III. SOLUTIONS TO TWO OF THE PROBLEMS EXISTING IN THE CURRENT CORPUS JURIS SPATIALIS

A. Investment security in settlements and resource exploitation sites can be accomplished through leases

Under current space law, there is no possibility of national sovereignty in outer space. Rather, all lands found outside of the planet earth, within our solar system, are deemed to be the "common heritage of all mankind." If the Moon Agreement is followed, then there is also no possibility for ownership of any land on the moon or other celestial body. The applicable provisions have the desired effect of negating the possibility of colonialism in outer space. However, the deleterious effect of instability is also accomplished.

As discussed above, settlers who move to the moon or other celestial body will be subject to the requirements of the existing corpus juris spatialis. If interpreted literally, the current corpus disallows ownership of the moon or other celestial body. Settlers, then, will spend arduous hours transforming a foreign environment into home, with no security that they will be allowed to remain there for any period of time. Rather, it could be determined at any point that the land upon which the settlement is established would best "benefit all mankind" through some other use. The settlers could be uprooted in favor of the new venture because they had no legal control over the land upon which their settlement was built. Thus it is clear that settlement would not be encouraged. In order to encourage persons to build, it is more logical to establish some form of security giving settlers some measure of control over the land under their home. Such control would add the requisite element of security necessary to attract investors to settle in outer space.

Ownership is, of course, the ultimate form of control and security. However, the goal of providing security of investment and incentive to settle can be accomplished short of allowing ownership of outer space. Since outer space has been deemed to be the "common heritage of mankind," it is not an extraordinary leap to assert that the people of the Earth collectively "own" outer space within our solar

142. See discussion supra part II.A.
143. Moon Agreement, supra note 5, at art. 11, ¶ 1.
144. It is important to recall, though, that the Moon Agreement is not currently applicable to any State with space-faring capabilities, save France and India, as none have ratified the Agreement. See supra notes 94-96 and accompanying text. For purposes of this comment though, it will be assumed that the provisions in the Moon Agreement regarding sovereignty and ownership of outer space surfaces are effective since these provisions have never been challenged (Article 11 is the object of most challenges).
145. See discussion supra part II.
We have already determined that no individual state, or person or organization may buy any portion of outer space, but owners of property have many options other than selling their land. What the author proposes is a system of leases which will benefit those persons occupying outer space as well as those remaining on earth.

First, a global organization, representing all the peoples of the earth could be formed to assume “control” over the areas that the earth “owned” in outer space. Second, a system for processing applications for leases would be established. The requirements made of the settlers to apply for a lease would be very straightforward and simple: anyone who inhabits, mines or otherwise improves a piece of extraterrestrial land for a continuous period of six earth months would be eligible to submit an application for a land lease to the global organization. The organization would then review the lease and determine whether or not to grant the exclusive rights to the applicant.

The lease issued to the applicant would convey the desired security to the settler without compromising the over-riding theory precluding ownership in outer space. The added security of the lease option would provide the necessary incentive to encourage those interested in investing their time and resources in settling in outer space.

B. Allowing investors to receive some profit from their efforts exploiting resources on celestial bodies can actually further the goals concerning the requirement that outer space benefits all mankind

We have already established that exploration and exploitation of outer space is now, and will be in the future, a very costly venture. “It is also clear that without adequate legal regulation, no government or commercial entity will undertake the risks and costs involved. Commercial enterprises will want to know how the benefits will be divided.” Therefore, if the Moon Agreement ever hopes to be ratified by the space powers, or exploitation of moon resources is ever to be...

146. To assume rights beyond our solar system would be nothing short of unabashed, arrogant presumption, and will raise incredible difficulties when extraterrestrial life is discovered.

147. See discussion infra part III.B.

148. Six months is an arbitrary time period chosen by the Author as a compromise figure between the interests of maintaining a lack of sovereignty in space, and the need to allow for greater security in investments. Clearly, the time frame could be easily adjusted.

149. Author’s note: Determinations made by the organization would clearly have to follow guidelines established before the lease process began so as to avoid subjectivity. Available lease types (i.e., residential, exclusive use rights, mineral rights, etc.) would also be determined by the global organization.

150. Mason-Zwaan, supra note 94, at 258.
come a reality, a plan needs to be drawn up now to define the regime
to be established under the Moon Agreement's Article 11.

In determining an appropriate scheme for the regime which will
regulate resource exploitation in outer space, it is helpful to study the
success and failures of similar ventures or propositions currently ex-
isting. The most natural parallel is to the Law of the Sea Convention
of 1982. In that convention, the 58 articles of Chapter 11, and two
Annexes (III and IV) are dedicated to the establishment of the Interna-
tional Seabed Authority. The "Authority" is responsible for licensing
and regulating all of the mineral extraction that takes place in the
"Area" (the Convention's term for the deep-sea bed), as well as com-
peting via its own company (creatively named the Enterprise) directly
with private organizations which it had licensed. Basically, private
organizations will submit proposals for leases. Each proposal must
contain two plots which the organization would be interested in devel-
oping, and the $500,000 processing fee. The Authority will then
choose to license one plot to the organization, for a fee of $1 million
per year, while the remaining plot will be withheld for the Authority's
own company, the Enterprise. The private organization would then
be required to still share a portion of its proceeds with the Authority,
to be distributed between the rest of the states parties to the treaty,
as well as to provide the Enterprise with the technology used by the
private organization in its mining efforts. Essentially, private inves-
tors are required to not only sustain, but aid the Enterprise in compet-
ing with them for the extraction and sale of deep-sea bed resources.

These provisions so distressed many of the developed nations of the
world (U.S. and U.K. included), that they originally hesitated in be-
coming parties to the Convention, giving up other important provi-

153. The very existence of the Authority was a bone of contention among the many States
that hesitated in signing UNCLOS (including the United States and United Kingdom-two of the
greater sea powers). The Authority, now established and headquartered in Jamaica, is funded
by all States Parties to the Convention, in proportion to their United Nations budget contribu-
tions. UNCLOS, supra note 151, at art. 171.
154. Id. at art. 170.
155. The higher the proceeds, the higher the percentage to be given to the Authority. All
percentages are calculated in Article 13 of Annex 3. Id., Annex 3, art. 13.
156. U.S. criticism here had been sharp, including complaints that "the Enterprise . . . would
compete with American mining interests and . . . 'could eventually monopolize production of
sea-bed materials,' and that the exchange of technology with the Enterprise would pose threats
to security." Harris, supra note 41 at 446.
157. Nations not signing before the summer of 1994 included the USA, UK, FRG, France,
Japan, Belgium, Italy and the Netherlands. See Masson-Zwaan, supra note 94, at 263, n. 27.
sions so as not to be bound by the Deep-Sea bed mining provisions. Clearly, then the regime enacted under the Moon Agreement, which has not yet been signed by most of the same states who initially resisted the Convention on the Law of the Sea, should learn from the past and attempt to better accommodate the interests of those states.

The regime the author proposes should work in tandem with the leasehold scheme proposed above, to facilitate an unified structure of outer space law. When an organization has completed its exploration, and determined where they would like to mine, they can set up a base camp, and inhabit the area for the requisite period of six earth months. The global organization will then extend the lease to the investors, and mining can begin. Mining shall proceed, with all sales and other benefits proceeding directly to the investors until such time as all costs have been recouped. When the investors have been reimbursed, and profits begin to be realized, there should be a reward period which will act as incentive to investors. Therefore, for the first six weeks of profit production, the investors shall receive all benefits and profits from production. After such time, the investor, in keeping with the international spirit of sharing attributed to space as “the common heritage of mankind,” shall begin to split the benefits of production, with the global organization. The investor shall retain 60% of the benefits, and shall transfer the remaining 40% to the global organization. The global organization shall then be responsible for the distribution of the benefits it receives from the outer space resource extractors. Special consideration shall be given by the organization to the developing nations of the world who have not had the opportunity to develop their own space programs when distributing the benefits.

With the above proposal, investors are given an adequate sense of stability in their developed sites via the leaseholds issued by the global organization. They are also provided incentive to extract the available resources through the provisions allowing for full recovery of costs and initial profit. Mankind is also benefited following the initial profit period by receiving a share of the advantages derived from outer space ventures. Many of the less developed nations may wish a larger share of the benefits, but a larger share may end up meaning less for those nations due to the smaller number of investors willing to mine the

158. See discussion supra part III.A.
159. Author’s note: If the organization is wary of investing time and resources in establishing the actual mining facilities, they could simply establish a base settlement to accomplish the same purpose of occupying the area for the required six earth months.
160. Moon Agreement, supra note 5, at art. 11, ¶ 1.
161. Author’s note: The global organization shall be responsible for determining whether “benefits” shall include profits or resources.
The more that investors and entrepreneurs can be encouraged to invest in outer space development, the more benefits there will be to divide, and the more mankind will benefit.

**Conclusions**

The current regime of outer space law is flawed because it fails to adequately accommodate the interests of those persons and groups who will be investing their time and resources in the exploration and development of outer space. Space exploration and the exploitation of the resources found on celestial bodies will be an exorbitant undertaking for those who first venture beyond earth’s atmosphere. In today’s economy, in order for an investment of that magnitude to occur, the end result must have an enormously lucrative potential with signs of stability and growth. The existing *corpus juris spatialis* prohibits sovereignty and ownership over outer space, limiting if not eliminating stability in outer space investments both for potential resource extractors and for settlers. Space Law currently also lacks a sufficiently well-defined regime to adequately inform investors of how resources extracted from celestial bodies will be regulated and divided.

In order to manage these problems, it is proposed that a global organization be set up to regulate and administer properties found beyond the earth’s atmosphere. The organization will have the duty of holding all the lands found in outer space as representatives of the people of earth, since all persons of earth “own” everything in the outer space found within our solar system in undivided, untransferable shares. Once a settler or investor can demonstrate to the organization that he/she has either occupied the outer space area, or improved it (including establishment of a resource extraction scheme) for a consecutive period of six earth months, he/she may submit an application for a lease to the organization. The organization shall consider the lease, and extend exclusive use rights in accordance with principles set out by it. Regarding the exploitation of resources, a more defined scheme is also enacted. When production begins, the investor shall be allowed to recover all costs incurred in the establishment of the extraction process. When costs have been recouped, the investor shall have six weeks of production wherein he/she shall retain control over 100% of the resources and profits. After that time, investor shall, in keeping with the theory that outer space shall benefit all mankind, split the benefits of production with the global organization at a rate of 60% for the investor, 40% for the organization. The organization will then determine how to disperse its 40% share, with special consideration being given to developing nations.
With a more defined base from which to plan, outer space will become a much more viable alternative for exploration and development. The above proposed alternatives attempt to assure incentive and reward for those who make the initial investment in outer space, while maintaining the underlying theory of Space Law. Herein, all will benefit, and the "final frontier" will finally be explored.