

Exclusion or Sharing? An Article 11 Resource Agreement for the Moon Treaty

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Abstract

As accessing and developing outer space resources becomes more feasible, determining the status of those resources under international law and norms becomes more important. The oldest and most widely accepted binding international treaty is the Outer Space Treaty of 1967 (OST). The most recent proposed norms are in the Artemis Accords (Accords), an inter-agency agreement adopted by the United States' National Aeronautics and Space Administration (NASA) and its partners as part of the Artemis Moon program. This paper concludes that Article II of the OST creates a *de jure* common-pool resource of outer space and that all subsequent agreements and activities are subject to it. It further concludes that any act of exclusion, even for "safety zones", violates Article II and defeats the common-pool resource. It further concludes that sharing access to resources will mitigate the exclusion, maintain the common-pool resource of outer space, and allow resource development activities, including the removal of materials in place (in situ). Finally, it will consider whether the Moon Treaty, with a possible implementation agreement, can enhance the development of outer space resources, including the building of permanent settlements.

1. Introduction – The Four Categories of Goods/Resources

Economist Elinor Ostrom received the Nobel Prize in 2009 for her work describing categories of goods/resources. She divided them into four categories depending upon two factors: are they excludable and are they subtractable (a.k.a. rivalrous)?¹ The results of this analysis can be shown as a grid:

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1 E. Ostrom. *Beyond Markets and States: Polycentric Governance of Complex Economic Systems*. Nobel Prize Lecture, Dec. 8, 2009, 412-13. <https://www.nobelprize.org/prizes/economic-sciences/2009/ostrom/lecture/>. Full paper at *American Economic Review*, vol. 100, no. 3, 641-72 (June 2010). <https://www.aeaweb.org/articles?id=10.1257/aer.100.3.641>.

Table 1

	Excludable	Non-Excludable
Subtractable	Private Resources	Common-Pool Resources
Non-Subtractable	Toll Resources	Public Resources

A Private Resource is one that is both 1) excludable, i.e. an entity/group can exercise private property rights, preventing others from accessing/using the resource; and 2. subtractable/rivalrous, i.e. use/consumption by one entity/group necessarily reduces the amount available for use/consumption by others. Examples include food, clothing, and automobiles. A more relevant example is an exclusive claim to the mining, recovery, or utilization of a resource.

At the other end of the spectrum are Public Resources, sometimes called a Commons. They are both non-excludable, (anyone can access/use them) and non-subtractable (use by anyone does not subtract from the availability of the resource for use by others). Examples include free-to-air television, open-source software, and, in outer space, solar energy.

In between Private and Public Resources are Toll (or Club) Resources and Common-Pool Resources. A Toll/Club Resource is like a Private Resource in that it is excludable to those who are not members of the club, but it is not subtractable to those entities who are members of the club, i.e., use will not deplete the resource or make it less accessible to other club members. A prime example is paid satellite communication services (video, sound, data, GPS). No matter how many entities use them, they are still available to those who pay the toll.

A Common-Pool Resource, by contrast, is not excludable; it can be accessed/used by any person, entity, nation, or group of nations. But it is also subtractable: use by anyone means less to use by anyone else unless there is some way to replenish the resource. On Earth these include resources that are beyond the exclusive claim of any national jurisdiction, such as ocean fishing stocks and undersea mineral deposits. In outer space, they include water ice in eternally dark craters, peaks of eternal sunlight that can harvest solar energy (the peaks themselves, not the sunlight), favorable locations for habitats (e.g., proximity to the poles or lava tubes), and mineral-rich asteroids.

2. The Non-Excludability of Space Resources

But why are such outer space resources non-excludable? Throughout history, nations have claimed such resources for their exclusive use, usually on a first come, first served basis. This process was accelerated during the Ages of Exploration, Colonialism, and Imperialism of the past five centuries. It

continues today in the Arctic as more resources become accessible. Within nations, under national laws, individuals and corporations have established exclusive claims to resources through discovery, access, and use. Why can't sovereign states and their nationals do the same concerning outer space resources?

The answer is the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, also known as the Outer Space Treaty (OST). It entered into force on October 10, 1967. As of September 2021, it has 111 States Parties, including almost all space-faring nations. It has been called the "Constitution of Space Law" and is the basis of all discussions for the governance of humanity's future in outer space.

The section of the OST that is most relevant to the current discussion is Article II, which states in its entirety:

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.²

Article II's prohibition against appropriation means that no State Party can claim exclusive ownership or right of use of any location or resource in outer space. Exclusion equals appropriation; the ban on appropriation thus creates a *de jure* (by law) common-pool resource of outer space.

This prohibition against exclusion also applies to any national of a State Party, e.g., any individual, corporation, or any other private or public entity:

Article VI

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 non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty.²

2 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, United Nations Office of Outer Space Affairs (1967).
http://www.unoosa.org/res/oosadoc/data/documents/2017/stspace/stspace61rev_2_0_html/V1605998-ENGLISH.pdf.

The Artemis Accords seek to facilitate the use of outer space by allowing entities to remove materials from “in place”, thereby acquiring private property rights in the materials:

SECTION 10 – SPACE RESOURCES

2. The Signatories emphasize that the extraction and utilization of space resources, including any recovery from the surface or subsurface of the Moon, Mars, comets, or asteroids, should be executed in a manner that complies with the Outer Space Treaty and in support of safe and sustainable space activities. The Signatories affirm that the extraction of space resources does not inherently constitute national appropriation under Article II of the Outer Space Treaty, and that contracts and other legal instruments relating to space resources should be consistent with that Treaty.³

Countries including the United States, Japan, and Luxembourg have passed national laws that grant private property rights to their nationals who extract and utilize space resources.⁴ There is growing consensus that such extraction and utilization of materials is indeed consistent with the Outer Space Treaty.⁵

3 The Artemis Accords, NASA (2020). <https://www.nasa.gov/specials/artemis-accords/index.html>.

4 National Space Laws, United Nations Office of Outer Space Affairs (2021). <https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/index.html>.

5 “3. 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 non- governmental organization, national organization or non-governmental entity or of any natural person.” Agreement Governing The Activities Of States On The Moon And Other Celestial Bodies (a.k.a. the Moon Treaty) (July 11, 1984) (emphasis added). <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html>.

Note that once a resource is no longer “in place” (a.k.a. *in situ*), it can be claimed as personal property.

See also The Hague International Space Resources Governance Working Group, Building Blocks for the Development of an International Framework on Space Resource Activities (2019).

(“8. Resource rights 8.1 The international framework should ensure that resource rights over raw mineral and volatile materials extracted from space resources, as well as products derived therefrom, can lawfully be acquired through domestic legislation, bilateral agreements and/or multilateral agreements. 8.2 The international framework should enable the mutual recognition between States of such resource rights. 8.3 The international framework should ensure that the utilization of space resources is carried out in accordance with the principle of non-appropriation under Article II OST.”). <https://www.universiteitleiden.nl/binaries/content/assets/rechtsgeleerdheid/instituut-voor-publiekrecht/lucht--en-ruimterecht/space-resources/bb-thissrwg--cover.pdf>.

But the Artemis Accords go further, establishing exclusive zones for such activity, an action that is not widely accepted.⁶ Though they are given the innocuous title of “safety zones”, they nevertheless rely upon exclusion. They do so in Section 11, “Deconfliction of Space Activities”³, in the following manner:

1. They **establish a unilaterally declared size for the zone** that depends on the nature of the activity, but without any other limitations (Paragraph 7(a)). An entire eternally dark crater could be designated a zone of activity for removing all the water ice there.
2. They are **unlimited in duration**, ending only when the resource activity is completed (7(c)). This would exclude any other party from accessing the resource until it was totally depleted.
3. Any effort by another party to access resources in the unilaterally declared zone is deemed to be “harmful interference” and a violation of Article IX of the OST.

Exclusion by any other name, including safety, is still exclusion, and exclusion is appropriation, which is specifically prohibited by Article II of the OST. Therefore, Section 11 of the Artemis Accords, as currently written, violates the Outer Space Treaty. The pronouncements in Section 11, and throughout the Accords, that they are intended to comply with the Outer Space Treaty are not enough to negate the exclusionary nature of the “safety” zones.

It is important to distinguish that Section 10 of the Accords, authorizing the extraction, recovery, and utilization of materials, does NOT violate the OST Article II ban on appropriation, no more than does fishing in the open seas. It is the establishment of exclusion zones under Section 11 of the Accords that violates the ban on appropriation.

Fortunately, the solution is simple. The parties to the Artemis Accords need only add the following sentence to the Accords, perhaps as a new subparagraph between Section 11 paragraph 7(c) and 7(d): “Access to resources shall be shared; any activity within the zones shall be conducted in such a manner that other parties can safely access any resource located there.”

Sharing access to resources mitigates the exclusive nature of the zones; there would be no violation of the Article II prohibition against appropriation. Indeed, if the above provision is adopted, then much of the language of Section 7 that creates the exclusionary zones becomes superfluous.

6 European Space Policy Institute, Artemis Accords: What Implications for Europe? ESPI BRIEFS No. 46, (Nov. 2020). <https://espi.or.at/downloads/send/5-espi-executive-briefs/554-artemis-accords-what-implications-for-europe>.

3. “Due Regard” Does Not Create a Substantive Right of Exclusion

The Artemis Accords rely on the concept of “Due Regard” and its companion, “Harmful Interference”, as the basis for Section 11 – Deconfliction of Space Activities. These concepts are found in the Outer Space Treaty:

Article IX

In the exploration and use of outer space, including the moon and other celestial bodies, States Parties to the Treaty *shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space, including the moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty. . . .* If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the moon and other celestial bodies, would cause potentially *harmful interference with activities of other States Parties in the peaceful exploration and use of outer space*, including the moon and other celestial bodies, 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 in outer space, including the moon and other celestial bodies, would cause potentially *harmful interference with activities in the peaceful exploration and use of outer space*, including the moon and other celestial bodies, may request consultation concerning the activity or experiment.² (emphasis added)

The Accords suggest that the “interests” protected by due regard are primarily economic interests, in particular the self-declared exclusive zones of space resource activity in Section 11. The Accords further assert that any infringement upon the exclusive zones would constitute harmful interference under the OST. Both interpretations are flawed.

The interests of the States Parties, as defined by Article I of the Outer Space Treaty, include “free[dom] for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and ... free access to all areas of celestial bodies.”² Rather than give due regard to these primary interests, the Accords restrict them. This is not the cooperation and mutual assistance mandated by Article I.

In addition, the prohibition against harmful interference does not protect all activity, but only “activities in the peaceful exploration and use of outer space.” (Article IX, above) Since the unilateral declaration of exclusive zones of activity violates Article II’s prohibition against appropriation, such zones

cannot be considered “activities in the peaceful exploration and use of outer space”, and therefore are not protected.

The principle of Due Regard under the Outer Space Treaty does not create a substantive right of exclusion for space resource activity. There is no “first come, first served” in the OST, only the call for international cooperation and a prohibition against appropriation. A State Party cannot claim harmful interference of a right that does not exist. Any reliance by the Artemis Accords on Due Regard and Harmful Interference for creating exclusive zones of activity is misplaced.

To summarize, it is not the extraction of resources under Section 10 of the Artemis Accords that violates Articles I and II of the OST. It is the exclusion of others from self-declared zones of resource activity under Section 11 that does so. Access to space resources must be shared.

4. The Subtractable/Rivalrous Nature of Outer Space Resources

Sharing access to resources addresses one of the issues presented by the *de jure* common-pool resource of outer space that is created by Article II of the Outer Space Treaty. But there is another issue that must be addressed, one that applies to any common-pool resource: the finite/limited nature of space resources.

Although the OST prohibits exclusion, it does not prohibit the acquisition and/or use of outer space resources. If outer space resources were infinite, this would not be a problem. Outer space would be considered a non-exclusive, non-subtractable public resource, a true public commons. But there are practical limits to the amount of space resources that can be accessed, primarily due to limits in current Earth technology. Although outer space is *de jure* non-excludable, it is nevertheless *de facto* subtractable, and thus a common-pool resource with the potential for conflict.

Examples of subtractable resources on the Moon include water ice in the craters of eternal darkness at the poles, along with the peaks of eternal sunlight where solar energy can be harvested. Note that the sunlight is not the subtractable resource; it is the land itself that is. Land has been considered a resource ever since the development of classical economic theory: it is tangible, its boundaries can be determined, and its value can be defined by its usefulness (i.e., the more useful the land at a given location, the more valuable it is as a resource).

There are different models for managing subtractable resources. The Artemis Accords rely on an exclusionary first-come, first served private property model. But as explained above, that model is prohibited by the Outer Space Treaty. It thus becomes necessary to create a new model, a new set of norms/agreements, that will provide the minimum legal structure necessary to support outer space activity.

The Space Treaty Institute (www.spacetreaty.org) has been working on such a legal framework since 2016. After much drafting, consultation, and revision, it has produced a resource utilization/management agreement that satisfies the requirements of Article II of the OST and Article 11 of the Moon Treaty. It is based on three organizational principles:

- 1) The Agreement must support all public and private activity;
- 2) It must protect essential public policies;
- 3) It must integrate and build upon current institutions and processes.

5. A Model Implementation Agreement for Article 11 of the Moon Treaty

1. SCOPE OF AGREEMENT

The provisions of this Implementation Agreement (“Agreement”) and the underlying Agreement Governing The Activities Of States On The Moon And Other Celestial Bodies (“Moon Treaty” or “Treaty”) shall be interpreted and applied together as a single instrument. In the event of any inconsistency between the Treaty and the Agreement, the provisions of the Agreement shall prevail. After the adoption of the Agreement, any instrument of ratification or formal confirmation of or accession to the Treaty shall also represent consent to be bound by the Agreement. No State or entity may establish its consent to be bound by the Agreement unless it has previously established or establishes at the same time its consent to be bound by the Treaty.

2. ADOPTION OF TREATIES

The States Parties agree to adopt and be bound by this Agreement, the underlying Treaty, the Treaty On Principles Governing The Activities Of States In The Exploration And Use Of Outer Space, Including The Moon And Other Celestial Bodies (“Outer Space Treaty”), the Convention On Registration Of Objects Launched Into Outer Space (“Registration Convention”), the Convention On International Liability For Damage Caused By Space Objects (“Liability Convention”), and the Agreement On The Rescue Of Astronauts, The Return Of Astronauts And The Return Of Objects Launched Into Outer Space (“Rescue/Return Agreement”), and to require their nationals also to be bound by them.

3. EXPLOITATION OF RESOURCES

The States Parties agree that any entity whose activity is authorized and supervised by a State Party shall have the right to exploit resources at the location of the activity. Exploitation of resources shall include but is not limited to: (a) the collection/extraction of materials, and (b) the use of land, including surface and subsurface locations, for any public or private activity. Access to resources shall be shared; any space resource activity shall be

EXCLUSION OR SHARING? AN ARTICLE 11 RESOURCE AGREEMENT FOR THE MOON TREATY

conducted in such a manner so that other parties can safely access any resources located at the site of the activity. The right to exploit resources shall terminate if the authorized entity fails to comply with the obligations in the above-listed treaties and this Agreement.

4. PUBLIC POLICY OBLIGATIONS

The States Parties agree that the obligations of the Treaty and this Agreement include the following:

1. Use outer space exclusively for peaceful purposes (Treaty Article 3.1);
2. Provide co-operation and mutual assistance (4.2);
3. Inform the public of:
 - Activities (5.1)
 - Scientific discoveries (5.1)
 - Any phenomena which could endanger human life or health (5.3)
 - Any indication of organic life (5.3)
 - The use of radioactive materials (7.2)
 - The discovery of resources (11.6)
4. Protect the environment and preserve areas of “special scientific interest” such as historic landing sites (7.1-7.3);
5. Allow free access to all areas by other parties (9.2).

5. REGISTRATION OF ACTIVITIES

The States Parties agree to register their activities on and near the Moon in accordance with the Registration Convention* when applicable, and to create and/or designate another process when not applicable. The States Parties agree to be guided by the principles of open access and due regard as established by the Outer Space Treaty when engaging in lunar activity.

6. STANDARDS AND RECOMMENDED PRACTICES

The States Parties agree to develop, in consultation with non-governmental entities, standards and recommended practices for the safe utilization of outer space resources by all interested countries, irrespective of their degree of economic or scientific development. Such standards or practices shall not require technology that is subject to export controls. The States Parties shall create or designate an official registry for such standards and recommended practices.

* The Registration Convention may be updated per recommendations in UNOOSA’s 2019 Guidelines for the Long-term Sustainability of Outer Space Activities.

7. PROTECTION OF NATURAL ENVIRONMENT; CULTURAL HERITAGE SITES

The States Parties, in accordance with Treaty Article 7, agree to develop standards and recommended practices to prevent the disruption of the existing balance of a celestial body's environment. The States Parties further agree to protect natural and cultural heritage sites, and/or to designate another entity/process for making such determinations that will be binding on the States Parties. Until such process is established, the States Parties agree to prohibit the use or disturbance of any location on the Moon or other celestial body that is the site of a mission that occurred prior to the year 2000 CE. This prohibition applies to the location of any equipment and any evidence of presence [e.g., footprints, tracks].

8. AGENCY; FEES

The States Parties agree to create an Agency, as needed, to administer the provisions of this Agreement and the Treaty. The States Parties are financially responsible for the administration of the Agreement and the Treaty. The collection and use of fees for administration or any other purpose is a substantive decision to be made by the States Parties.

9. DISPUTE RESOLUTION

The States Parties agree that any dispute concerning this Agreement or the Treaty shall be addressed using the consultation process detailed in Treaty Article 15. As an alternative, the States Parties hereby authorize the voluntary use of binding arbitration in accordance with the 2011 Permanent Court of Arbitration Optional Rules for Arbitration of Disputes Relating to Outer Space Activities. The results of such arbitration shall be enforceable under The Convention on the Recognition and Enforcement of Foreign Arbitral Awards ("New York Convention").**

10. CONTROLLING LAW; RIGHTS OF INDIVIDUALS; SETTLEMENTS

In accordance with Treaty Article 12, the States Parties agree that the controlling law at any location shall be the law of the country that authorized/supervises the activity at that location, subject to the Treaty and this Agreement. Relations between locations of different States Parties will be governed by current international law until such time as new substantive rules are created by the States Parties. Nothing in this Agreement or in the Treaty shall be interpreted as limiting the rights of individuals under the

** The Liability Convention may be updated in accordance with UNOOSA recommendations.

Universal Declaration of Human Rights or the formation of sovereign states by settlements under customary international law.

6. The Need for an International Framework of Laws to Manage Space Resource Activity

Why is this proposal necessary? As of September 2021, there is no internationally recognized mechanism for managing the utilization of space resources, including the land used for public or private activity. The current controlling international law is the Outer Space Treaty of 1967, which prohibits any one country or its nationals from appropriating anything:

Article II: 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.²

Many countries agree that the prohibition against appropriation prevents any one country from granting exclusive property rights. Some disagree, enough to create the potential for conflict and uncertainty for businesses and investors. Since the function of law includes avoiding conflicts and reducing uncertainties, it is imperative to create an international legal framework for private activity in outer space.

The Moon Treaty provides the international authority to manage resource utilization. Article 11 does not prohibit resource utilization; it just prohibits any one country or group of countries from imposing their exclusive regime on others:

11.1. The moon and its natural resources are the common heritage of mankind, *which finds its expression in the provisions of this Agreement*, in particular in paragraph 5 of this article.

11.2. The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means.

11.3. 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 non-governmental organization, national organization or non-governmental entity or of any natural person. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the moon, including structures connected with its surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the moon or any areas thereof. *The foregoing provisions are without prejudice to the international regime referred to in paragraph 5 of this article ...*

11.5. 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.”⁵ (emphasis added)

Note that Article 11 begins by stating that the “common heritage of mankind” is defined by the Moon Treaty and its implementation agreement. The CHM has no legal meaning or force of law beyond the framework that the States Parties adopt.

The rest of Article 11 authorizes the States Parties to create an international framework of laws for managing resource utilization, so long as they do it together.

The proposed Model Implementation Agreement is not meant to address all conceivable issues, only those that are necessary at this time to protect essential public policies while providing the legal support necessary for sustainable public and private activity.

7. A Limited Central Authority

The polycentric governance of complex systems means that there is no need to establish a new governing body or agency; limited authority, with principles and processes, is vested in treaties, and the States Parties mutually enforce the requirements using dispute resolution mechanisms.

The above Model Implementation Agreement for the Moon Treaty includes seven basic principles and processes:

1. Share access to resources, including materials and land/locations;
2. Share information, including discovery of resources;
3. Register activities;
4. Develop standards, recommended practices, interoperability;
5. Protect natural environment, scientific/historical sites;
6. Dispute Resolution, including consultation, arbitration, and mediation
7. Honor rights of individuals, settlements

Some of these have been explained above. A few more merit further consideration.

8. Developing Standards and Practices

The Model Implementation Agreement requires the States Parties to develop standards and recommended practices (SARP’s) – sometimes called “best practices” – for the development of outer space resources. It does not create a super-agency that will override efforts that have been developing organically,

though it does mandate that “standards or practices shall not require technology that is subject to export controls.” Rather, it requires the States Parties work with NGE’s, providing them a seat at the table and legal support for their work. The International Organization for Standards (ISO)⁷, the Committee on Space Research (COSPAR)⁸, the Moon Village Association⁹, For All Moonkind¹⁰, and the Space Treaty Institute¹¹ are examples of such organizations.

The Treaty anticipates that there will be ongoing advances in technology that will require a constant updating of standards and practices. It is essential for the States Parties to integrate the work of NGE’s into this process. Otherwise, a vast pool of talent and innumerable hours of work will be wasted. The Treaty and Implementation Agreement will lack organizational support and will likely fail.

9. Protecting Historical/Scientific Sites

Article 7.3 of the Moon Treaty authorizes the preservation of sites of scientific interest:

States Parties shall report to other States Parties and to the Secretary-General concerning areas of the moon having special scientific interest in order that, without prejudice to the rights of other States Parties, consideration may be given to the designation of such areas as international scientific preserves for which special protective arrangements are to be agreed upon in consultation with the competent bodies of the United Nations.⁵

The Model Implementation Agreement clarifies that “special scientific interest” includes historical/cultural sites. It is unclear whether a new organization/process will need to be established to meet these goals or if the task will be given to an existing organization (“competent body”) such as UNESCO. Until such decisions are made and procedures in place, the Model Implementation Agreement protects sites that are more than 20 years old. (Par. 7)

7 International Organization for Standards (ISO). <https://www.iso.org/home.html>.

8 The Committee on Space Research (COSPAR). <https://cosparhq.cnes.fr>.

9 The Moon Village Association. <https://moonvillageassociation.org/>.

10 For All Moonkind. <https://www.forallmoonkind.org/>.

11 The Space Treaty Institute. <http://www.spacetreaty.org/>.

10. Resolution of Disputes

One of the best ways to provide minimal overall management of space resource activities is to let the interested parties sort out their differences themselves. Doing so requires establishing a process for resolving disputes.

Article 15 of the Moon Treaty describes levels of dispute resolution, beginning with consultations between the States Parties. Any other State Party can join in the consultations, and any State Party can request the assistance of the Secretary-General of the United Nations. If consultations fail to resolve the dispute, the States Parties are instructed to “take all measures to settle the dispute by other peaceful means of their choice appropriate to the circumstances and the nature of the dispute.” (Art. 15.3)

The Model Implementation Agreement also allows parties to voluntarily choose binding arbitration under the Permanent Court of Arbitration.¹² It also authorizes enforcement of any decision/award under a widely accepted convention.

Non-binding mediation is also available, now that there is a separate international convention for enforcing any resulting agreements.¹³ The decisions/agreements reached during any dispute resolution will help form the customary international law that will guide future activity.

11. Individual Rights

What if an inhabitant of a settlement seeks asylum in another country’s facility? The Moon Treaty and the Outer Space Treaty contain certain provisions that suggest that their country of origin retains jurisdiction and can have them returned.

Such control would conflict with the Universal Declaration of Human Rights (“UDHR”), which states in Article 14.1 that “Everyone has the right to seek and enjoy in other countries asylum from persecution.”¹⁴ The Model Implementation Agreement incorporates the protections of the UDHR. As explained above, this would override national laws and allow individuals to

12 Permanent Court Of Arbitration, *Optional Rules For Arbitration Of Disputes Relating To Outer Space Activities*. <https://pca-cpa.org/wp-content/uploads/sites/6/2015/12/Permanent-Court-of-Arbitration-Optional-Rules-for-Arbitration-of-Disputes-Relating-to-Outer-Space-Activities-1.pdf>.

13 United Nations Convention on International Settlement Agreements Resulting from Mediation (New York, 2018) (the “Singapore Convention on Mediation”). https://uncitral.un.org/en/texts/mediation/conventions/international_settlement_agreements.

14 Universal Declaration of Human Rights, United Nations (1948). <https://www.un.org/en/about-us/universal-declaration-of-human-rights>.

remove themselves from the legal authority of one country and enter the authority of another.

12. Settlements

Including the land used for settlements in the definition of “resources” is essential for creating an international framework of laws that is sufficiently comprehensive to support all private activity in space. It is the only way to override the prohibitions against appropriation in both the Outer Space Treaty and the Moon Treaty (see above). This is done by interpreting “the exploitation of the natural resources of the moon” in Article 11.5 to include the use of any land/location on the Moon for any purpose.

When the Moon Treaty was first proposed, some individuals and NGE’s, led by the L5 Society (now merged with the National Space Society), opposed it because there were no provisions for establishing private settlements with their own governance.¹⁵ They pointed again to Articles 11.2, which states that “the moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means” and 11.3’s prohibition against ownership. But as explained above, the international framework of laws authorized by Article 11.5 overrides those prohibitions. The proposed Model Implementation Agreement also confirms that a settlement can seek autonomy and/or independence through established international protocols. In doing so it promotes the principles of polycentrism and subsidiarity while discouraging tendencies such as colonialism and over-control by a centralized authority. Some governance is essential, but the government that governs least governs best.

The hopes and dreams of individuals and groups to create new societies in outer space are just as important as the entrepreneurship of those seeking to engage in space commerce. Both must be recognized, honored, and nurtured if humanity is to leave our home planet in a sustainable manner. The Model Implementation Agreement states that “Nothing in this Agreement or in the Treaty shall be interpreted as limiting the rights of individuals under the Universal Declaration of Human Rights or the formation of sovereign states by settlements under customary international law.” (Paragraph 10) Any international framework of laws must acknowledge and incorporate these protections, or it will fail.

15 Henson, H. Keith and Lucas, Arel, *Star Laws*, *Reason* Magazine, Aug. 1982. <https://groups.google.com/forum/#!msg/sci.space.policy/u8i2OEytsmA/8PTk7o3QVDYJ>. Mr. Henson was a founder and the first president of the L-5 Society; Ms. Lucas was the editor of L-5 News. The L-5 Society has since merged with the National Space Society (NSS).

13. The Historical Perspective

The early 21st century is an extraordinary time. Humanity has been presented with an historic opportunity as it prepares to leave its home planet. Like those who went forward during the Age of Exploration five centuries ago, the decisions we make today will affect humanity for centuries, perhaps millennia. If ever there has been a time to determine how to implement humanity's collective vision for the future, it is now.

In October 1957, people all over the world stood outside their homes as the sun set, looking to the sky as a blinking light passed overhead, the tumbling upper stage booster of the world's first satellite, Sputnik. Because of the Cold War there was some fear, but for most the overwhelming emotions were excitement, inspiration, and hope. Despite all its imperfections, all its follies, and all its deadly conflicts, humanity had managed to throw off the shackles of gravity and reach the stars. All the stuff of science fiction suddenly seemed possible. And not just the stuff about technological advances; the writers, the poets, those who dared to dream of a better future saw a day when humanity could resolve its differences by peaceful means and move forward together.

This dream was enhanced a decade later, in December 1968, when our view of the world literally changed. As Apollo 8 rounded the Moon, the astronauts on board were suddenly overwhelmed as humans saw the Earth rising above the lunar horizon for the first time. The picture taken at that moment showed our home planet, beautiful and fragile, hanging in the vastness of space. Humanity as a species began to realize that we are all one, living together on a small planet hurtling through the cosmos.¹⁶



But even though no borders were visible, war and suffering continue to wrack the home world. In the half-century since, people have begun to lose faith in their governments, their private institutions, even in humanity itself. Every day people wake up to news of the increasingly disastrous effects of climate change, racial/gender injustice, worsening economic inequality, and assaults on democracy. To that has now been added the threat of war in

¹⁶ Earthrise: The 45th Anniversary, NASA (video). <https://www.youtube.com/watch?v=dE-vOscpiNc&t=3s>.

outer space. The people of Earth are beginning to despair, wondering if there is anything they can really believe in. They are losing hope, and the resulting cynicism is poisoning our politics, our relationships, even our thinking.

The mission of space law must be nothing less than to restore that hope, to inspire humanity by giving the people of our planet a future they can believe in. To counter the despair of war and violence and neglect. To build that shining city on a hill that will light the way for all.

14. The Time to Act

It has been over 500 years since the world has had such an opportunity to start anew. At that time, European countries used their advanced technology to perpetuate military conquest and economic exploitation as they competed for resources, causing widespread misery and countless wars. And when the Industrial Revolution came along, governments placed profits ahead of people, resulting in economic and environmental catastrophe. By 2021, many people have stopped believing in their ability to control their own destiny, or humanity's.

We can change that. We can avoid making the same mistakes. But doing so requires immediate action. There will be only one time when humanity leaves our home world, only one chance to create a new pattern that will lead each person, and all nations, to their best destiny. That time is now.

Share the Moon!