

Mars: A Case Study in Space Law

Mars, a television series on the National Geographic channel, began its second season on November 12 (available at <https://www.nationalgeographic.com/tv/mars/>). If the first episode is any indication, it will provide an in-depth look at the legal issues presented when private enterprise begins to operate on other celestial bodies.

In the opening scene, a private spaceship that looks about the size of SpaceX's BFR lands close to a science base without warning, with pieces of its heat shield almost hitting some of the people and structures there. This immediately raises two issues: 1) non-interference with other human activities on celestial bodies, and 2) proper notification of time, place, and nature of such activities. Both issues are addressed by the Moon Treaty:

Article 5

1. States Parties shall inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of their activities concerned with the exploration and use of the moon. Information on the time, purposes, locations, orbital parameters and duration shall be given in respect of each mission to the moon as soon as possible after launching.

Article 8

3. Activities of States Parties in accordance with paragraphs 1 and 2 of this article shall not interfere with the activities of other States Parties on the moon. Where such interference may occur, the States Parties concerned shall undertake consultations in accordance with article 15, paragraphs 2 and 3, of this Agreement.

The Moon Treaty, proposed by the United Nations but not yet adopted by the U.S. and other space-faring nations, applies to all celestial bodies in the solar system except the Earth. (For text of all U.N. recognized space treaties, go to http://www.unoosa.org/res/oosadoc/data/documents/2017/stspace/stspace61rev_2_0_html/V1605998-ENGLISH.pdf). Its application to private parties is discussed below.

The enterprise that lands on Mars is a mining and construction company. Issue: what right do they have to mine and sell resources there? The Outer Space Treaty (OST) states that no nation can claim sovereignty over any territory on any celestial body:

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.

But the Moon Treaty provides that commercial rights can be granted by an international framework of laws and its implementing agency:

Article 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 foregoing provisions are without prejudice to the international regime referred to in paragraph 5 of this article.

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.

As suggested by the Hague Space Governance Resources Working Group, those rights can be defined as “priority rights” of access and usage, rather than permanent property rights.

6. Access to space resources

6.1 The international framework should enable the unrestricted search for space resources.

6.2 The international framework should enable the attribution of priority rights to an operator to search and/or recover space resources *in situ* for a maximum period of time and a maximum area upon registration in an international registry, and provide for the international recognition of such priority rights. The attribution, duration and the area of the priority right should be determined on the basis of the specific circumstances of a proposed space resource activity.

- *Draft Building Blocks for the Development of an International Framework on Space Resource Activities*. For full text of building blocks, go to <https://www.universiteitleiden.nl/binaries/content/assets/rechtsgeleerdheid/instituut-voor-publiekrecht/lucht--en-ruimterecht/space-resources/draft-building-blocks.pdf>

The Hague Group thus follows the general guidance of the Moon Treaty to create only such laws and rights “as such exploitation is about to become feasible” rather than trying to control the distant future. This is good advice for all interested parties.

In *Mars*, shortly after landing, the private company demands water and power from the scientific base, claiming that it must be provided under the Outer Space Treaty:

Article V

States Parties to the Treaty shall regard astronauts as envoys of mankind in outer space and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of another State Party or on the high seas. When astronauts make such a landing, they shall be safely and promptly returned to the State of registry of their space vehicle.

In carrying on activities in outer space and on celestial bodies, the astronauts of one State Party shall render all possible assistance to the astronauts of other States Parties.

The commander of the science base replies that the private company should not have started its mission without assuring that they had adequate supplies for self-sufficiency. The issue thus presented is an interesting one: is providing help mandated when the party seeking help deliberately puts itself in a position of needing it? Requiring sustainability up front will avoid such issues in the future. The agency that licenses such activities under the Moon Treaty should have as a requirement for licensing that an enterprise must be ready, willing, and able to sustain itself, thus avoiding such self-created “emergencies”.

At one point the private company starts to lay their water pipeline through an area being examined by the scientists for extra-terrestrial life. That would be a violation of both the non-interference clause of the Moon Treaty (above) and the special protections given to areas of scientific inquiry:

Article 7

3. 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.

Similarly, the “priority rights” for resource extraction proposed by the Hague Group are limited to “abiotic” resources, an additional protection for extra-terrestrial life:

2. Definition of key terms

2.1 Space resource: an extractable abiotic resource *in situ* in outer space.
(see *Draft Building Blocks*, above)

That limitation should be made explicit in an Implementation Agreement for the Moon Treaty.

Later, one of the engineers from the science base is injured while helping at the private base. Who is liable for his injury and damages? What law controls? The OST and the Moon Treaty both state that the laws of the country of origin apply not only at their bases, but also over their personnel, wherever they are:

Article VIII (OST)

A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body.

Article 12 (MT)

1. States Parties shall retain jurisdiction and control over their personnel, vehicles, equipment, facilities, stations and installations on the moon. The ownership of space vehicles, equipment, facilities, stations and installations shall not be affected by their presence on the moon.

So what happens if the personnel of one country is at the base of another country? Such “choice of laws” issues would also need to be addressed in the Implementation Agreement for the Moon Treaty.

That Agreement would also need to create a structure for dispute resolution. The Hague Working Group has recommended the use of arbitration, specifically the 2011 Permanent Court of Arbitration Optional Rules for Arbitration of Disputes Relating to Outer Space Activities (see *Building Blocks*, Section 18). But that process can be too slow and cumbersome for dealing with the ever-changing situations presented by exploration and development. The agency created to administer the international framework of laws under the Moon Treaty would likely be much more efficient and timely in addressing such matters. It could even serve as the arbitrator if it came to that.

The plot for *Mars* includes an underlying assumption that the primary mission is to terraform the planet immediately to make it habitable for humans. They seem to believe it can be accomplished in decades, which runs counter to most scientific thinking and is the biggest technical flaw in the series. But the legal issue is still interesting: Who makes the decision to terraform Mars? What if some form of life is found, even if microbial? The Moon Treaty forbids altering the “balance” of the environment of any celestial body:

Article 7

1. In exploring and using the moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment, whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise.

The Implementation Agreement for the Treaty would need to address the process of how humanity decides if it wishes to terraform another celestial body. It is not enough to leave such a consequential decision to individual countries, private groups, or wealthy entrepreneurs, no matter how adventurous or good-willed.

At the end of the episode, when the commander of the science base raises some of these issues with the leader of the private operation, the leader states that “We don’t need to follow any treaty. We’re a private company. And our country hasn’t adopted the treaty, either.” The first issue he presents is the applicability of space law to private companies. Most scholars believe that the treaties do apply to private entities, as they must operate “under the control and supervision” of their countries of origin.

Article VI (OST)

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. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.

Article 14 (MT)

1. States Parties to this Agreement shall bear international responsibility for national activities on the moon, 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 this Agreement. States Parties shall ensure that non-governmental entities under their jurisdiction shall engage in activities on the moon only under the authority and continuing supervision of the appropriate State Party.

2. States Parties recognize that detailed arrangements concerning liability for damage caused on the moon . . . may become necessary as a result of more extensive activities on the moon. Any such arrangements shall be elaborated in accordance with the procedure provided for in article 18 of this Agreement.

But the United States House of Representatives has recently passed a bill that specifically excludes private enterprise from “national” regulations.

The Federal Government shall not presume all obligations of the United States under the Outer Space Treaty are obligations to be imputed upon United States nongovernmental entities.

- American Space Commerce Free Enterprise Act of 2017, § 80103(c)(2)(C)
(<https://docs.house.gov/billsthisweek/20180423/HR2809.pdf>)

The Implementation Agreement for the Moon Treaty would need to specify that such obligations do indeed apply to all non-governmental entities, including private enterprise. Since United States space laws defer to “international obligations”, that would be enough to establish such jurisdiction.

Finally, there is the issue of countries that will not sign the Moon Treaty and its Implementation Agreement. The solution here is not legal but practical: countries that do not sign the Treaty/Agreement, along with their non-governmental entities, would not be licensed for any celestial activities under the international framework of laws. If they pursued such activities anyway, their claims to resources would not be recognized, and none of the member countries (including their NGO’s) would be permitted to purchase any goods or services from such operators. The threat of such exclusion would most likely force all space-faring countries to sign the Treaty and Agreement, just as similar practical considerations have forced all countries to join the World Trade Organization, whatever their political philosophy.

National Geographic is doing humanity a great service with its *Mars* series. It is presenting the legal issues most likely to confront us in space before we get there. With this glimpse into the future, it becomes more apparent that we need to adopt the Moon Treaty, along with an Implementation Agreement that addresses the outstanding issues noted above. We still have time as a species to work together and cooperate as we leave the planet and establish humanity on other celestial bodies. Or we can rely on militant nationalism and unregulated industries, which history has shown leads to unending conflict and unnecessary suffering.

As Klaatu reminded us, the choice is ours.

(Dennis O'Brien is a lawyer and former member of the NASA/Hastings Research Project. He is currently director of The Space Treaty Project. This year he published his first novel, *Major Tom*, about the race back to the Moon. For more information about the Project, the book, and a petition in support of the Moon Treaty, please go to spacetreaty.org.)