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PROVIDING FOR SUSTAINABLE EXPLORATION AND USE OF OUTER SPACE ENVIRONMENTS

John D. Rummel
East Carolina University, USA, rummelj@ecu.edu

Pascale Ehrenfreund
George Washington University, USA, pehren@gwu.edu

The challenges of human presence and long-term activities in space are growing more and more concrete—an encouraging trend. One of the hopeful threads in current space flight and exploration planning is the emergence of capable non-State Parties with goals that may have both eclectic and commercial relevance. Because this emergence is essential to the development of a true space economy, it has long been a feature in science fiction, but now with the rise of private actors an elaboration of the legal and regulatory regimes associated with the use of extraterrestrial planetary environments appears necessary. For example, non-State Parties launching from a State signatory to the 1967 Outer Space Treaty (OST) [1] are subject to the Treaty's articles, but different launching venues differ greatly in the specifics of their implementation and enforcement of the Treaty. Too, there is no general provision under the OST to provide for Treaty-sanctioned use of specific outer space environments, nor for the practical prevention of "harmful contamination" of celestial bodies. Thus, OST implementation provisions in national laws differ, or may be nonexistent. For the future expansion of planetary exploration, including the diversity of proposed commercial private uses of outer space environments, it is time to consider steps to be taken to clarify and complement the current legal regime. A new framework is needed to enable both greater legal protection for outer space environments and a consistent and predictable legal landscape for commercial space endeavors, Based in part on several workshops held under the auspices of COSPAR during the last three years [cf., 2] and a 2010 report from the IAA on "Protecting the Environment of Celestial Bodies" [3] we will discuss an approach to the development, adoption, and implementation of a convention subordinate to the OST that can provide for the administration and enforcement of these contrary (to some) principles.

PRÉCIS OF THE FULL TEXT

With considerable fanfare a number of firms have announced their intention to participate in the commercialization of one or another aspect of outer space. Whether it is Planetary Resources going after asteroid materials, Golden Spike pursuing "affordable, reliable, and frequent human expeditions to the Moon," or Mars One looking to "establish a permanent human settlement on Mars," and field some good reality TV, as well, the concepts are visionary and the means appear to be technically approachable, if not in-hand. And those impressions are supported by commercial endeavors such as SpaceX and others that are achieving regular success in the development and use of launch systems and human-rated spacecraft in Earth orbit.

That being said, there are regulatory and financial issues associated with the ability of any of these entities to achieve their goals (or anybody's goals) beyond Earth orbit. On the financial side, the lack of a regulatory framework expansive enough to cover the commercial aspirations of these enterprises means that investments may be put at risk by governmental inaction or adverse decisions made later. On the regulatory front, the lack of a structure under which to operate is incompatible with the need to operate in full view of both the public and the various spacefaring nations and agencies that monitor activities in outer space, especially the comings and goings of spacecraft in the vicinity of the Earth. Most, if not all, of the "States Parties" which have signed the Outer Space Treaty (OST) of 1967 have not established any regulatory framework, compatible with the OST or otherwise, that provides for commercial activities that may involve the protracted use of outer space locations or environments, or the transfer of outer space materials for the purpose of profit.

Balancing Cost vs. Benefit for "All Mankind"

In their statement of 22 March 2009, the Board of Directors of the International Institute of Space Law went on record as saying that "Since there is no territorial jurisdiction in outer space or on celestial bodies, there can be no private ownership of parts thereof, as this would presuppose the existence of a territorial sovereign competent to confer such titles of ownership" [5]. They motivate that statement, and the IISL position, with the concept that "The clear goal of such a regime is to preserve outer space, including the Moon and other celestial bodies, for the exploration and use of all mankind, not only for those States and private enterprises that are capable of doing so at any particular time." They are mute on the logistical side of the argument, wherein one would ensure that "all mankind"

could be made capable of simultaneously exploring and using outer space. Likewise, they fail to note that the word "preserve" does not appear in the OST at all. "Use," "exploration," and "harmful contamination" do, and the first two are to be encouraged and the third is to be prevented, but the OST nowhere spells out a means by which this can be done—which was a comfortable position during the height of the Cold War, when the OST was born, but at this juncture represents a clear hole, into which something (and someone) must move or the potential benefits to "all mankind" envisioned by the Treaty framers will not be realized in whole or in part. As a place in which humanity might find an alternative home, outer space has long been peopled in our fiction, but we are not too far from it happening in fact. As a place in which there are profits to be made, now or in the future, outer space may yet provide an opportunity for benefits to be returned to Earth, and to become available to "all mankind" if their governments take the initiative to make that happen. For regulatory, fiscal, and commonwealth reasons, a licensing and enforcement regime (akin to the International Seabed Authority under the UNCLOS [5], but without its faults) is needed.

IMPLEMENTING THE OST: A POSSIBLE FUTURE

As a statement of principles and an outline of the general concepts under which activities associated with the exploration and use of outer space should be undertaken, the OST has served ably, despite its lack of enforcement mechanisms or regular revision and reinforcement among the States Parties. Nonetheless, now is the time to envision providing for the principles of the Treaty to be applied in an operating framework that can extend them and re-interpret them, as necessary, for the future of commercial and private activity in outer space.

The OST as a Foundation for Future Regulations: Implementing a Complementary/Supplementary Regime

The IISL Board of Directors noted the lack of a "territorial sovereign competent to confer...titles of ownership" as a salient fact about the OST, but they did not address the existence of the one group who could (under the Treaty) decide to change that—namely the States Parties to the Treaty, themselves. In order to make the OST a living document, motivating a regulatory regime for the exploration and use of outer space environments (locations in, on, or around solar system bodies), then the existence of a territorial sovereign must be established as a source of territorial jurisdiction going forward by a convention of the parties. This sovereign entity (for convenience referred to here as the "Interplanetary Licensing Authority" (ILA)) can be charged with the prevention of "harmful contamination" of those outer space environments as well as with the regulation of their exploration and use, and would form the basis for a stable, uniform regulatory regime that would enable investments into profit-making (hopefully) enterprises that could then pay a share of that profit into activities that would benefit "all mankind" both in the support of the ILA itself and in direct spending to support the participation of any State that wishes to participate in the grand adventure. One concept of how to do that has been espoused by COSPAR's PEX in the past [6], although it will be important to stay away from the built-in conflicts of interest that were manifested by the charter of the International Seabed Authority under the UNCLOS [5]. An informed and active licensing regime can both engender outer space commerce and participate in its successes by an appropriate mix of incentives and royalties.

REGULATORY CHOICES UNDER AN INTERPLANETARY LICENSING AUTHORITY

If a convention of the parties under the OST decides to establish itself as a territorial sovereign capable providing appropriate jurisdiction over solar system environments, an ILA or something like it can be formed both for the near-term and with an appropriate eye to the evolution of human governance and commerce beyond Earth orbit. Any such entity should be composed for the long-term, recognizing that human interests and the perspectives associated with central versus self-regulation will change in an expanding human population. It would be appropriate if one of the goals of an ILA would be to divest itself of authority over some solar system environments over the course of time, as human movement into the rest of the solar system eventually changes the very perception of what can be meant by "all mankind."

Elements of an ILA

Initially, however, an ILA would need a variety of capabilities to function under an agreement by States Parties to the UN Outer Space Treaty (note that this does not automatically imply that the required regime is an arm of the United Nations, cf., the Antarctic Treaty System). These include:

- A framework for the protection of extraterrestrial environments within an international strategy for the exploration, commercialization, and human habitation of space
- The capability to identify important extraterrestrial environments and monitoring their preservation and/or development
- Independent scientific advice
  - Provide credibility, relevance, legitimacy
  - Knowledge generation
  - Knowledge assessment

  - Regular, timely, policy relevant
  - Research on extraterrestrial environments
- Economic assessments and investment expertise
- A licensure (with related fees) for different environments/concessions granted by the ILA
- Legal expertise and an enforcement arm (including internal affairs checks and balances)
- An appropriate tribunal to adjudicate disputes among the parties
- Liaison with States Parties for field operations and on-site enforcement assistance, as needed
- Mechanisms for continuing technical and scientific cooperation among the States Parties
- Training of future experts (capacity building) in science, law, and economics
- Public education and awareness, including public participation in assessing the impacts of development projects and planetary surface exploration
- Transparency, with a full exchange of publicly available information prior to decision-making

It's a Big Solar System

In the foreseeable future, the effort needed to move either humans or robots into the far reaches of the solar system will continue to be immense. Even if rocketry were to become inexpensive, the vast expanses of the solar system will continue to face human explorers whether on Earth or enroute to some solar system environment or the other. These travelers, whether explorers, extractors of wealth, scientists, or even colonists will be putting their life on the line to arrive at their eventual destinations, and to stay there—most likely for the rest of their lives, although not necessarily so. It is impossible to believe that anyone surviving under those conditions, and becoming successful at it, won't feel entitled to a personal share of the solar system environment in which they live and work.

Accordingly, one eventual goal of the ILA should be to structure a system wherein private ownership of solar system locations can be attained, and in particular attained by individuals who can contract with the ILA to earn that private ownership under fair conditions and without requiring the sponsorship of a large corporation or other semi-governmental owner of large tracts of the solar system. That is not to say that large tracts should never be developed, but that a route to private ownership by individuals is one key area of solar system governance that should not have to be forced on the ILA, but should be the subject of some serious forethought instead

After all, there is quite a bit of solar system to go around.

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