

# CURRENT AND FUTURE ISSUES IN INTERNATIONAL SPACE LAW

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## I. ABSTRACT

Space law is a relatively new area of law and is based mainly on a set of United Nations (U.N.) Treaties negotiated during the 1960s and 1970s. To date, most space issues have been solved through diplomatic channels rather than through decisions of national or international courts. There is little case law that directly applies to space, but there are many analogies that can be drawn through case law and customary international law that provide precedents applicable to space situations. There still remain many issues concerning space law that are unresolved. One reason is the lack of issues ripe for a court or legislative determination. Another reason is the built-in flexibility of the system of space laws that allow for changing interpretations and definitions. Neither of these issues is inherently bad, but the lack of easy resolution to potential problems does add risk to business and government decisions. In particular, as some space programs slowly migrate from government owned and controlled projects to profitable commercial ventures, new challenges for space law will be ever present. These remarks reflect on a few of those areas where the current laws and regulations will likely need to be modified as space activities evolve in the 21st Century.

## II. INTRODUCTION

The term “space” is used in many different ways. Each use of the term can have very different legal implications. Therefore, it is very important to use precise language when analyzing issues of space law. Sometimes just the lack of precision alone can create vast literature and discussion on space law issues.

For example, neither treaties nor most laws define exactly where the atmosphere ends and space begins. For commercial purposes, there are three areas in space: the Earth’s atmosphere, the edge of outer space, and achieving orbit. The law regarding the atmosphere is clearly defined—nations have sovereignty over the air above their country. Through treaty agreements, no nation can claim sovereignty in outer space. The area in between remains

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undefined in law. Private companies developing flights to the edge of space for paying customers will fly to altitudes that are in this undefined region of approximately 100 km above the Earth. In the United States, the government through the Federal Aviation Administration (FAA) has established a licensing regime for these flights under the office that issues licenses for space activities. If an accident occurs in this zone that involves international issues, it is unclear whether the rules of international aviation would apply or the provisions of the space treaty agreements would apply. Very different outcomes with regard to liability could result.

Therefore, the question of what is space and how it is defined is extremely important. "Space" can be viewed in a number of ways.<sup>1</sup> Among them are:

- 1) A geographic location without sovereignty or governments;
- 2) A place to perform research;
- 3) A place to conduct business (i.e. using platforms to transmit information or to extract valuable resources);
- 4) A hostile environment for human beings that requires multiple life-support operations to permit humans to live there;
- 5) An empty vacuum filled with debris;
- 6) A place of importance for defense, security, and military operations.

Each different perspective of what space is can have very different legal implications. If, for instance, space is viewed as a vast area with a lot of junk (debris) floating aimlessly around, one would not put much value into a location in space. The reasoning would be two-fold: that with so much empty area, almost any position is open for anyone to use, and that the debris would create a high level of risk in using the space. That line of reasoning would place a very low value on an orbital position.

But, if one views space as a place to conduct business with potentially large revenues from terrestrial customers, the value of an orbital position might be quite high and the risks of failure from debris might create either a movement to manage those risks more efficiently than we now do and/or a stronger legal commitment among nations to make those who created the man-made debris pay high damage claims.

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1. Note that the term, space, can also be used to define an industrial sector that produces space hardware, a government agency, and a number of other activities terrestrially. This article focuses on activities that may occur in space or involve objects actually in the space environment and the law(s) that can be applied to those activities.

The major legal implications of differing views of space also include the rights to access and use space, the right to conduct commercial transactions in space and use space for commercial purposes, the role of governmental use of space in relation to other uses, the responsibility for environmental damage, and the liability for any damages created by human use of space. As commercial and security uses of space grow during the 21st Century, it will be of primary importance that the legal regime for space be consistent and predictable for each different use of space and across different uses of space. In addition, consistency of at least legal principles of space law, if not the laws themselves, will be very important across the different nations that use space.

International space law is built on a number of different legal precedents. There are a number of multinational treaties and agreements that include the U.N. Charter, the Antarctica Treaty System, maritime law including the Law of the Sea Treaty, aviation law and the various Conventions (Warsaw, Chicago, Montreal, etc.) that govern international air transport, the International Geophysical Year agreement, and the International Telecommunications Union. Other related agreements include those pertaining to nuclear arms and defense, commercial transactions, intellectual property, meteorology, and other inter-governmental issues. Finally, customary international law is also applied to space situations where appropriate.

Specifically, international space law is governed by the U.N. Treaties dealing with space issues. There are five of these treaties that were negotiated and came into force during the 1960s and 1970s. Reflecting that era, these treaties mainly were agreements and compromises between the United States and the Soviet Union, the two major space powers of that era. It is a testimony to the strength of the general principles guiding these Treaties that they have survived and continue (with some definitional modifications) to define space law in today's vastly different geopolitical and economic environment.

The basic principles driving the Treaties are:

- 1) Space is the "province of mankind." It is a place that can be accessed by all nations and peoples and used for their mutual benefit. No nation can declare sovereignty on the Moon and other celestial bodies, and international cooperation in space pursuits is encouraged;
- 2) There is the freedom of scientific investigation, exploration, and use of space by all nations and peoples. Nations are encouraged to share with others the results of scientific findings;
- 3) States are responsible for their actions and the actions of their citizens in space. This principle establishes the foundation for nations to develop their domestic laws and practices to develop a legal regime that insures they will assume financial liability

for damage caused by their space equipment and that they will protect the fragile environment of space;

- 4) Space shall be used for peaceful purposes and no weapons of mass destruction shall be put in place in space. This principle aims to keep space free from military actions and to absolutely prohibit the placement of nuclear weapons in space.

The treaties and a summary of the number of ratifications are:

- 1) The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies<sup>2</sup> (General Assembly resolution 2222 (XXI), annex)—adopted on 19 December 1966, *opened for signature* on 27 January 1967, entered into force on 10 October 1967; 1/2008: 98 ratifications; 27 signatures;<sup>3</sup>
- 2) The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space<sup>4</sup> (resolution 2345 (XXII), annex)—adopted on 19 December 1967, *opened for signature* on 22 April 1968, entered into force on 3 December 1968; 1/2008: 90 ratifications; 24 signatures;<sup>5</sup>
- 3) The Convention on International Liability for Damage Caused by Space Objects<sup>6</sup> (resolution 2777 (XXVI), annex)—adopted on 29 November 1971, *opened for signature* on 29 March 1972, entered into force on 1 September 1972; 1/2008: 86 ratifications; 24 signatures;<sup>7</sup>
- 4) The Convention on Registration of Objects Launched into Outer Space<sup>8</sup> (resolution 3235 (XXIX) annex)—adopted on 12 November 1974, *opened for signature* on 14 January 1975, entered into force on 15 September 1976; 1/2008: 51 ratifications; 4 signatures;<sup>9</sup>

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2. Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 215.

3. G.A. Res. 2222 (XXI), U.N. Doc. A/6431 (Dec. 19, 1966), *available at* [http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares\\_21\\_2222.html](http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares_21_2222.html) (last visited Feb. 26, 2009).

4. Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119.

5. G.A. Res. 2345 (XXII), U.N. Doc. A/6804 (Dec. 19, 1967), *available at* [http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares\\_22\\_2345.html](http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares_22_2345.html) (last visited Feb. 26, 2009).

6. Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187.

7. G.A. Res. 2777 (XXVI), U.N. Doc. A/8420 (Nov. 29, 1971), *available at* [http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares\\_26\\_2777.html](http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares_26_2777.html) (last visited Feb. 27, 2009).

8. Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 187.

9. G.A. Res. 3235 (XXIX), U.N. Doc. A/9620 (Nov. 12, 1974), *available at* [http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares\\_29\\_3235.html](http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares_29_3235.html) (last visited Feb. 26, 2009).

- 5) The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies<sup>10</sup> (resolution 34/68, annex)—adopted on 5 December 1979, *opened for signature* on 18 December 1979, entered into force on 11 July 1984; 1/2008: 13 ratifications; 4 signatures.<sup>11</sup>

The first treaty is commonly referred to as the Outer Space Treaty (OST) and is the master document, with the others elaborating on the principles and specifics. It is interesting to note that the last treaty, the Moon Treaty, has been ratified or signed by only a few nations and has yet to be considered a definitive document for space law. As the United States, Europe, China, and India develop plans and equipment to return to the Moon during the next decade or two, the various elements of the Moon Treaty will attract more attention from the legal community, and certain difficult issues will need to be resolved, whether or not this Treaty is ratified by many additional nations.

There are also a number of non-binding U.N. resolutions that have been passed by the General Assembly that apply to space. They include:

- 1) The Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, adopted on 13 December 1963 (resolution 1962 (XVIII));<sup>12</sup>
- 2) The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, adopted on 10 December 1982 (resolution 37/92);<sup>13</sup>
- 3) The Principles Relating to Remote Sensing of the Earth from Outer Space, adopted on 3 December 1986 (resolution 41/65); The Principles Relevant to the Use of Nuclear Power Sources in Outer Space, adopted on 14 December 1992 (resolution 47/68);<sup>14</sup>
- 4) The Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All

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10. Dec. 18, 1979, 1363 U.N.T.S. 3.

11. G.A. Res. 34/68, U.N. Doc. A/34/68 (Dec. 5, 1979), *available at* [http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares\\_34\\_0068.html](http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares_34_0068.html) (last visited Feb. 27, 2009).

12. G.A. Res. 1962 (XVIII), U.N. Doc. A/RES/1962 (Dec. 13, 1963), *available at* [http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares\\_18\\_1962.html](http://www.oosa.unvienna.org/oosa/SpaceLaw/gares/html/gares_18_1962.html) (last visited Feb. 26, 2009).

13. G.A. Res. 37/92, U.N. Doc. A/RES/37/92 (Dec. 10, 1982), *available at* <http://www.un.org/documents/ga/res/37/a37r092.htm> (last visited Feb. 26, 2009).

14. G.A. Res. 41/65, U.N. Doc. A/RES/41/65 (Dec. 3, 1986), *available at* [http://www.oosa.unvienna.org/oosa/en/SpaceLaw/gares/html/gares\\_41\\_0065.html](http://www.oosa.unvienna.org/oosa/en/SpaceLaw/gares/html/gares_41_0065.html) (last visited Feb. 26, 2009); G.A. Res. 47/68, U.N. Doc. A/RES/47/68 (Dec. 14, 1992), *available at* <http://www.un.org/documents/ga/res/47/a47r068.htm> (last visited Feb. 26, 2009).

- States, Taking into Particular Account the Needs of Developing Countries, adopted on 13 December 1996 (resolution 51/122);<sup>15</sup>
- 5) Application of the concept of the “launching State,” adopted 10 December 2004, (resolution no. 59/115);<sup>16</sup>
  - 6) Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects, adopted 17 December 2007, (resolution no. 62/101).<sup>17</sup>

These treaties and resolutions can only go part of the way to developing national and international space legal regimes that will well serve future years. Commercial interests are not directly addressed in these treaties. It is up to each nation to interpret the principles of the treaties and to apply them in domestic laws. Many nations, including space-faring nations, have not developed a full set of comprehensive space laws and regulations. Coordination among nations does occur, but domestic laws are designed to implement rules consistent with the legal system of each nation that does not always integrate well with those of other nations. And, each nation will always act to preserve its own territory and borders through defense and security policies and programs.

Virtually all space activity has both civilian and defense (dual-use) purposes. Keeping the political, economic, and security aspects of space in balance internationally is not an easily achievable goal. The current legal regime has been remarkably good over the past forty years in helping to maintain a peaceful and productive international space environment. But, the challenges facing nations in the 21st Century will be formidable in this area as commercial uses of space grow and many additional nations develop independent space programs that enable them to access and use space.

On the optimistic side, multilateral international agreements such as the one that governs the International Space Station (ISS) are noteworthy. The ISS Agreement creates rules that permit national laws to apply to each module but also recognize the cooperative efforts needed for servicing and operating the Station. It deals with many aspects ranging from intellectual property rights in inventions made in space, the sharing of common facilities, and even to any criminal activity that, however unlikely, might occur on the ISS. A key element

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15. G.A. Res. 51/122, U.N. Doc. A/RES/51/122 (Dec. 13, 1996), available at <http://www.un.org/documents/ga/res/51/a51r122.htm> (last visited Feb. 26, 2009).

16. G.A. Res. 59/115, U.N. Doc. A/RES/59/115 (Dec. 10, 2004), available at [http://www.oosa.unvienna.org/pdf/gares/ARES\\_59\\_115E.pdf](http://www.oosa.unvienna.org/pdf/gares/ARES_59_115E.pdf) (last visited Feb. 26, 2009).

17. G.A. Res. 62/101, U.N. Doc. A/RES/62/101 (Dec. 17, 2007), available at <http://www.undemocracy.com/A-RES-62-101.pdf> (last visited Feb. 26, 2009).

is the flexibility of the Agreement and the ability to adapt it to changing conditions. Although this may not be an exact model for future international cooperative space programs, it does set some legal precedents and illustrates the potential for productive cooperation in space.

In summary, the existing overall space law regime works. It has created “soft law,” which still has to develop as conditions warrant. There are few actual cases that have been adjudicated concerning activities actually occurring in space. Most space law today focuses on more mundane problems such as negotiating government contracts, applying for domestic licenses for launch and operation of satellites, allocating spectrum rights, or complying with export control issues. In some cases, commercial companies have been sold or gone into bankruptcy. These issues are most often handled through national laws and regulations and sometimes through the interaction of national representation at organizations such as the International Telecommunications Union.

In the very few cases of space objects of one nation falling to Earth and causing harm to another nation, diplomatic solutions to liability for damages have been found, avoiding the need for formal adjudication.

The future could be very different and the following paragraphs outline a few of the areas where difficult international legal issues could emerge over the next couple of decades. Most of these issues center on the ambiguities and definitional problems in the set of Outer Space Treaties and involve private ownership and operation of space assets—a space scenario that was recognized but too far in the future for the drafters of the Treaties in the 1960s to be concerned about.

The two examples that are described below are the registration of space objects and the designation of a launching state. Both examples are related to the issue of national responsibility and liability for activities in space, and both are emerging as key issues in the risks of investing in commercial space and the relationship of national interests with private interests. And, both issues have been addressed in recent U.N. General Assembly Resolutions, but remain problematic in law.

The current regime for the registration of space objects is based on each nation that has ratified the Registration Convention is required keep a registry of all of its launches and equipment in space. Although “space objects” are defined to include all identifiable objects (those with a number and national identifier) no matter how small, in reality the registered objects are mainly launch vehicle stages that are in orbit and payloads in orbit. It is up to each nation to decide what to register, and there are differences in interpretation. It is up to the nation to send the information to the U.N., and there is no designated time frame for compliance in the Convention. Registration is permanent, and there is no provision to remove an object from the U.N. registry nor is there a formal way to transfer it to another nation.

Registration, therefore, has no commercial significance. It is not a statement of ownership. A satellite can be sold, and at least officially, the new owner may bear no ultimate responsibility for any harm it may cause. Yet, it would be helpful to the growing commercial satellite industry to have an internationally recognized system of secured rights in space systems. There is a proposed Convention on such rights that the International Institute for the Unification of Private Law (UNIDROIT) has drafted. It has not been ratified. And, since eight years have elapsed since it was drafted, the prospects for its adoption are not good.

Although 125 states have ratified or signed the OST, less than sixty have ratified the Registration Convention.<sup>18</sup> One problem facing the future of the use of space is the possibility that regulating commercial space payloads might change from today's relatively predictable registration and liability system governed by the few major space-faring nations to one that is closer to today's maritime system characterized by "flags of convenience." This situation should be avoided because it will lead to a much less organized and much more dangerous environment for all legitimate space endeavors. Today the nations using space, with minor exceptions, abide by a set of rules that are not perfect but work reasonably well to identify and regulate space activity. Registration is one of several systems to coordinate these efforts. If an orderly system is replaced by a free-for-all with companies looking for the cheapest and easiest regulatory authority, the already fragile space environment will become even more so, adding needless risk and cost to expensive systems.

Other than the UNIDROIT proposals, the only formal attempt to address the problems of the Registration Convention is the U.N. Resolution on Registration (62/101- December 17, 2007).<sup>19</sup> This document has no legal standing, but it does make suggestions for nations to act on which will recognize the commercial realities that now characterize the current situation in space and which were not present when the Treaties were drafted forty years ago.

Those suggestions include: a more uniform reporting of information to the U.N.; a determination before a launch on which state should register an object; each object (i.e. launch vehicle upper stage plus multiple satellites on the vehicle) for joint launches to be registered separately; and that it is the responsibility of the state of registry to notify the U.N. of any new owners of a space object. In addition, if there is no state of registry, an "appropriate" state can furnish the U.N. with information and not assume the responsibility for liability.

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18. See U.N. Treaties and Principles on Space Law, <http://www.unoosa.org/oosa/en/SpaceLaw/treaties.html> (last visited Feb. 26, 2009).

19. G.A. Res. 62/101, *supra* note 17.



This Resolution does not recommend any changes to the liability regime under The Convention on International Liability for Damage Caused by Space Objects.

The second related issue concerns a very unique component of the OST. Article II states that the “Launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the Earth or to aircraft flight.”<sup>20</sup> Article III establishes fault liability for damage elsewhere than on the surface of the Earth.<sup>21</sup> Article VI of the OST requires that a state be internationally responsible for activities of its citizens in space and must provide authorization and continuous supervision.<sup>22</sup>

Taken together, these provisions are unlike those applicable to any other industry or industrial sector. If there is an accident involving a space object that causes damage to a third party in a country that does not have any connection with that space object (i.e. is not a Launching State and whose citizens are not involved) the Launching State itself ultimately is financially liable for the damage. That state can, of course, require companies operating under its jurisdiction to have insurance, and the state can also require the companies to pay for damage, but if the companies are judgment proof or cannot pay, the state is still liable. In one sense, this puts virtually every private space activity into a “partnership” with a government entity.

The application of these Treaty provisions is dependent on the definition of a Launching State and the State of Registry. From the above remarks, it is clear that Registration has a number of issues that need clarification. The same is true of the definition of a launching state. In fact, even among the set of space Treaties, there are slightly different requirements for determining the launching state.

The U.N. Resolution: Application of the concept of the “launching State,” adopted 10 December 2004, (resolution no. 59/115) also address some of these issues with an overall recommendation for states to clarify these matters.<sup>23</sup> Some of the important and unanswered questions are:

- 1) What if a state only provided the payload and had no connection with the launch? Should it also be equally responsible for damages? And, what if the object, not the launch, was the cause of the damage?
- 2) Is a launching state always a launching state? Can there be a transfer of registry?

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20. G.A. Res. 2777 (XXVI), *supra* note 7, art. 2.

21. *Id.* art. 3.

22. *Id.* art. 6.

23. G.A. Res. 59/115, *supra* note 16.

- 3) Is a national license conclusive evidence of a state being a launching state?
- 4) What are the differences in government obligations between: "Launching State," "State of Registry," "appropriate State Party," and "launching authority?"
- 5) Does registration have a bearing on liability?

Although the Resolution does not provide conclusive answers to any of these questions, it does recommend that states reach conclusive agreements in accordance with the Liability Convention with respect to joint launches or cooperative programs. In other words, it requests states to think through these questions before a launch occurs and to reach a contract, accord, or some form of formal understanding with other involved states that would be specific to each launch that involves multiple states. The Resolution also recommends voluntary submission of information to the U.N. of any changes in the on-orbit ownership of assets. And, it also includes a recommendation that states enact national legislation that deals with liability and oversight of non-governmental entities under their supervision.

This, as with the other U.N. Resolutions, is not a legal directive. It is weak and has no enforcement components. However, it is a recommendation that concerns issues likely to emerge as even more important to the space industry in the 21st Century than it has been in the past.

I will conclude these remarks with a shopping list of other complicated issues facing the future of space, and particularly the growing area of commercial space. All of these issues, either by domestic government laws, international agreements, or private contractual arrangements will have to be resolved sometime in the relatively near future. They are:

- 1) How will nations resolve issues of property rights on the Moon and other celestial bodies given the Treaty provisions that prohibit states from declaring sovereignty in space?
- 2) How will nations balance the requirements not to harm the space environment with commercial interests that may necessitate disturbing pristine territory?
- 3) How will nations collectively approach safety regulations for human beings in space or on the Moon?
- 4) How can civil government and commercial cooperative international space programs develop in the most advantageous way and not be unduly hindered by unilateral restrictions on exports and by other security or defense restrictions?

The answers to these and other related issues will determine the speed and applicability of the immense advantages that working in space, with space assets, can be used for the benefits of all nations and peoples in the future.