

Max Planck Encyclopedias of International Law



Spacecraft, Satellites and Space Objects

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Content type: Encyclopedia entries

Product: Max Planck Encyclopedias of International Law [MPIL]

Module: Max Planck Encyclopedia of Public International Law [MPEPIL]

Article last updated: June 2007

Subject(s):

Spacecraft, satellites, and space objects

Published under the auspices of the Max Planck Foundation for International Peace and the Rule of Law under the direction of Rüdiger Wolfrum.

A. Definition

1. Space Objects

1 'Space object' remains an undefined term of key importance in the → *United Nations (UN)* conventions relating to → *outer space*. In practice, 'space object' refers to any object that is launched or attempted to be launched into outer space, including the components, launch vehicles, and parts thereof. 'Space object' thus includes spacecraft, space vehicles, satellites, space stations, installations, equipment, and facilities.

2 Arts VII and VIII 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') refer to a space object as 'an object launched into outer space', including 'objects landed or constructed on a celestial body'. The formulation of Art. VIII Outer Space Treaty is echoed in the reference in Art. 12 (1) Agreement Governing the Activities of States on the Moon and Other Celestial Bodies ('Moon Agreement') to 'vehicles, equipment, facilities, stations and installations', all of which are subsumed under the term 'man-made space objects' in Art. 3 (2) Moon Agreement.

3 Efforts to define the term space object in the negotiations leading up to the Convention on International Liability for Damage Caused by Space Objects ('Liability Convention') and the Convention on Registration of Objects Launched into Outer Space ('Registration Convention') met with little success. However, Art. 1 (b) Registration Convention provides that 'the term "space object" includes component parts of a space object as well as its launch vehicle and parts thereof', a formulation repeated in Art. 1 (d) Liability Convention. It may be significant to note that the rules of jurisdiction (→ *Jurisdiction of States*), registration, and liability (→ *Outer Space, Liability for Damage*) refer generally to 'space objects'.

2. Spacecraft

4 References to 'spacecraft' and 'space vehicles' have been used synonymously in the UN treaties relating to outer space to denote any crewed or uncrewed device that is to be used, moved, or stationed in outer space or on celestial bodies. Art. V Outer Space Treaty refers to 'space vehicle', while Arts 1 to 4 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space ('Astronauts Agreement') refers instead to 'personnel of a spacecraft'. The terminology spacecraft is also used in Art. 3 (2) Moon Agreement. Significantly, both the Outer Space Treaty and the Moon Agreement distinguish space vehicles from space stations, installations, equipment, and facilities.

3. Satellites

5 The term 'satellite' is also not defined in any of the UN treaties relating to outer space. However, the Moon is described as a 'natural satellite of the earth' in the preamble of the Moon Agreement. Art. IV Outer Space Treaty refers to objects being placed 'in orbit around the earth', while Art. V Registration Convention makes mention of objects 'launched into earth orbit'. The term satellite is also undefined in the treaties establishing the International Telecommunications Satellite Organization ('INTELSAT') and the International Maritime Satellite Organization ('INMARSAT'). In the latter two treaties however, the term satellite refers to an artificial earth satellite. However, artificial satellites may of course be placed in orbit around other celestial bodies. For example, Art. 3 Moon Agreement prohibits the placement of nuclear weapons or weapons of mass destruction 'in orbit around' the Moon.

B. Use, Jurisdiction, and Ownership

6 Freedom in the exploration and use of outer space, as well as 'free access to all areas of celestial bodies' by space objects is provided for in Arts 1 and 2 Outer Space Treaty. Art. 8 Moon Agreement provides for the freedom of landing, launch, placement, or movement on, above and below the surface of the Moon and 'other celestial bodies within the solar system, other than the earth'. However, Art. IV Outer Space Treaty prohibits the placement in earth orbit of space objects 'carrying nuclear weapons or any other kinds of weapons of mass destruction' (→ *Weapons of Mass Destruction*), the installation of such weapons on celestial bodies, or the stationing of such weapons in outer space in any other manner (→ *Weapons, Prohibited*). Art. 3 Moon Agreement repeats this prohibition in relation to the Moon and other celestial bodies within the solar system.

7 Art. VIII Outer Space Treaty provides that '[o]wnership of objects launched into outer space...is not affected by their presence in outer space or on a celestial body or by their return to the Earth'. Art. VIII further provides that a 'State Party...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'. Art. VIII is repeated by Art. 12 (1) Moon Agreement. Both treaties do not however, prohibit the abandonment of space objects by States.

8 Significantly, neither the Astronauts Agreement nor the Liability Convention refer to the State of registry as envisaged in Art. VIII Outer Space Treaty. Instead, these two treaties refer to the 'launching authority' (Astronauts Agreement) and the 'launching State' (Liability Convention). It was only three years after the Liability Convention that the Registration Convention resolved the issue of registration. Where there is no registration, jurisdiction would depend on ownership, as provided for in Art. 12 (1) Moon Agreement where States Parties retain jurisdiction over their space objects on the Moon.

9 Art. XII Outer Space Treaty places limitations on the State of registry's jurisdiction over its space objects by providing that 'stations, installations, equipment and space vehicles on the Moon and other celestial bodies' should be open to other States Parties on the basis of → *reciprocity* and with reasonable advance notice and consultations. A similar obligation exists in Art. 15 Moon Agreement, although for the purpose of verifying → *compliance* with the Moon Agreement.

C. Registration and Consequences

10 The registration of space objects was initially aimed at the identification of these objects and the responsible State Party should damage be caused. Further, it was hoped that this would allow the scientific community and public at large greater access to the benefits of space exploration, while providing States Parties with a mechanism by which to verify treaty compliance. Art. XI Outer Space Treaty therefore requires States Parties to inform the UN Secretary-General (→ *United Nations, Secretary-General*), the public, and the international scientific community of the nature, conduct, location, and results of their initiatives in space exploration, 'to the greatest extent feasible and practicable'. The Registration Convention went a step further in providing for a system of mandatory registration at the national and UN levels.

11 At the national and institutional level, Art. II Registration Convention requires the launching State to 'register the space object by means of an entry in an appropriate registry which it shall maintain' upon the launch of the space object into earth orbit or beyond. Art. II (3) Registration Convention gives the State of registry complete discretion in the operation and maintenance of the register. In the case of a joint launch, the launching States jointly determine which one of them should register the object. Art. VII Registration

Convention allows certain international intergovernmental organizations to accede to the Registration Convention by accepting the rights and obligations thereto. In this case, the organization may arrange with one of its Member States to exercise jurisdiction and control over the object the organization has registered.

12 At the UN level, Art. III Registration Convention provides that the UN Secretary-General should maintain a UN Register. Entities maintaining registers are under an obligation to provide information carried on their registers to the Secretary-General 'as soon as practicable'. Under Arts IV and V, such information includes the designators or registration numbers of the space objects; date and territory or location of launch; basic orbital parameters; and general function of the space objects.

Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return.

13 This is further extended by Art. 12 (2) Moon Treaty, which provides that this obligation pertains also to '[v]ehicles, installations and equipment or their component parts [on the Moon] found in places other than their intended location'. Art. 5 (1) Rescue Agreement requires States Parties to notify the launching State and the UN Secretary-General if a space object has returned to the earth on territories under their jurisdiction, on the high seas, or in any other place not under the jurisdiction of any State. A similar obligation exists under Art. 13 Moon Agreement in regard to forced landings of space objects on the Moon.

D. Liability for Damage Caused

14 Art. VII Outer Space Treaty, the Liability Convention and Art. 14 (2) Moon Agreement regulate the issue of liability where damage is caused by a space object. In such cases, States are liable for damage caused by their space objects, whether such damage is caused to another State or its nationals, and in some circumstances, also where damage is caused to the space objects of another State.

E. Evaluation

15 The novelty of the regime governing space objects is due to the unique legal environment they are intended for. The high risk, high stakes work involved in the exploration and use of outer space has led to a myriad of creative solutions to deal with possible legal issues that may arise. The increasing militarization of outer space (→ *Military Objectives*) on the one hand and the commercialization of outer space on the other, together with their attendant legal, technical, and economic consequences, will dictate the progressive evolution of international space law. A potentially significant issue is the negotiation at present of a registry on space assets, which may include space objects. The object of this registry is to keep track of space assets with a commercial value. Other issues pertaining to commercialization include the issue of private property rights and ownership over space objects, legal standards pertaining to safety in the use and deployment of space objects, and the dual-use aspects of space objects.

16 One aspect pertaining in particular to space objects is space traffic management and the problem of space debris. Several working groups have been established at the UN and intergovernmental levels to study this growing problem, as more and more space objects are launched, deployed, used, or abandoned in earth orbit.

17 The question of jurisdiction will also arise on a recurring basis from multiple perspectives. Issues in this regard include jurisdiction over space objects placed in international space stations and facilities, and liability for damage caused thereof, an example of which exists with the International Space Station and is documented in the Agreement Concerning Cooperation on the Civil International Space Station; joint commercial launches from the → *high seas* such as from SeaLaunch, questions of jurisdiction over hybrid space vehicles such as the space plane, especially those with a commercial purpose such as those built by SpaceShipOne and in production by various commercial space flight providers. With the economic potential and rapid technological advances relating to space objects, international space law must develop creatively to ensure that the rule of law is not left in the dust of the commercial exploitation of outer space.

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