Where does Outer Space begin?

Abstract
According to international law, there is not a defined point at where the atmosphere ends and outer space begins. However, some attempts have been made, such as Karman line (100 km above mean sea level). Hence, the problem arouses of whether certain activities, such as sub-orbital flights, should be covered by air law or space law. How can legal questions regarding these activities be answered, if the applicable legal regime is unclear? In answering the main question, it is essential to define 'outer space' and understand the differences between it and the airspace.

Outer Space
Outer Space can be defined as the environment that surrounds Earth and the denser parts of its atmosphere. The Atmosphere of Earth is layers of gas (mainly nitrogen, oxygen, argon) surrounding Earth and retained by the planet's gravitational force; does not end at a certain altitude but gets progressively thinner.[1]

The boundary between Airspace and Outer Space is not legally defined.
The boundary between Airspace and Outer Space is not clearly defined, neither from a physical, geographical or legal perspective. States have not defined a lower limit of outer space by means of a treaty norm. Since airspace is subject to full State sovereignty while outer space (including the Moon and other celestial bodies) is not subject to national appropriation, the question arises where the first ends and the latter begins. (F.e.: The OST uses key terms without defining them. It has led to a long-lasting debate around the definition and delimitation of outer space. Such discussions are a regular agenda item at the Legal Subcommittee of the COPUOS.)[2]

The Difference between the Outer Space and the Airspace
The exploration and use of outer space shall be carried out for the benefit of all peoples irrespective of the degree of their development and it calls for international cooperation to that end. Space is no State's property, but *res communis*. Space law is rooted in public international law.
In Article 1 of the Paris Convention on the Regulation of Aerial Navigation, States affirmed "complete and exclusive" sovereignty over the airspace above their territory. Important parts of international air law are codified in the Convention on International Civil Aviation of 1944.[3]

Karman line
The altitude where the speed necessary to aerodynamically support an airplane to fly equals orbital velocity; often arbitrarily used as boundary between the atmosphere and outer space. This altitude (100 km above the surface of the Earth) is where the gravity starts to weaken. The legally non-binding Karman line was named after T. von Kármán.[4]

Attempts to delimitate Outer Space
As for the scope of application of space law (versus air law), two schools of thought can be distinguished. The functional approach: the aim/type of the activity that should determine the applicable law. The spatial/conceptual approach: the place of the activity that should determine the applicable law. Despite decades of discussions, no consensus has yet been found on the definition of delimitation of outer space.[5]

United Nations Committee on the Peaceful Uses of Outer Space working groups
The COPUOS is an inter-governmental body of the UN General Assembly (UNGA) and the main discussion forum for UN Member States on matters relating to the exploration and peaceful uses of outer space.
The Committee has two standing subcommittees: the Scientific and Technical Subcommittee (STSC) and the Legal Subcommittee (LSC),[6] and it is served and supported by the United Nations Office for Outer Space Affairs (OOSA)[7]

Living without legal definition of space: Suborbital flights
Follows a parabolic (ballistic) trajectory; Suborbital activities include sounding rockets, ballistic missiles, high-altitude point-to-point passenger transport systems and suborbital space tourist flights.
Do sub-orbital flights belong to the regime of air law or space law, both or neither of them? Functional and spatial approaches have been suggested, but problems arise as there is no 'suborbital category' in either international air law or space law.[8]

Outcome
There is still not an accepted definition of outer space and of its limits, and relatively little consideration was even given to the problem of where outer space begins until the successful orbiting of the first artificial satellite in 1957; after this, international instruments have been established and used to regulate outer space activities. There have even been suggestions to postpone the problem of delimitating outer space until more experience and more clarifications have been gained.[9]

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[1] Soucek, Alexander: Space Law Essentials, Volume I: Textbook. Neue Praktikerskripten NPS, p. 9, 127.
[2] Soucek, Alexander: Space Law Essentials, Volume I: Textbook. Neue Praktikerskripten NPS, p. 9, 127.
[3] Soucek, Alexander: Space Law Essentials, Volume I: Textbook. Neue Praktikerskripten NPS, p. 9, 14, 88.
[4] Soucek, Alexander: Space Law Essentials, Volume I: Textbook. Neue Praktikerskripten NPS, p.77, 128; Soucek, Alexander: Space Law Essentials. Volume 2: Casebook, p. 33.
[5] Soucek, Alexander: Space Law Essentials, Volume I: Textbook. Neue Praktikerskripten NPS, p. 23.
[6] Soucek, Alexander: Space Law Essentials, Volume I: Textbook. Neue Praktikerskripten NPS. Page 16, 17.
[7] Brünner, Christian – Soucek, Alexander: Outer Space in Society, Politics and Law, p. 202.
[8] Soucek, Alexander: Space Law Essentials, Volume I: Textbook. Neue Praktikerskripten NPS. Pages 88–89.
[9] United Nations General Assembly, A/AC.105/C.2/7, 7.5.1970, p. 6, 8).

Where Does Outer Space Begin?

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Abstract

According to international law, there is not a defined point at where the atmosphere ends and outer space begins. However, some attempts have been made, such as Karman line (100 km above mean sea level). Hence, the problem arouses of whether certain activities, such as sub-orbital flights, should be covered by air law or space law. How can legal questions regarding these activities be answered, if the applicable legal regime is unclear? In answering the main question, it is essential to define 'outer space' and understand the differences between it and the airspace.

Delimitation of outer space and problems of living without legal definitions of outer space

Karman line: The altitude where the speed necessary to aerodynamically support an airplane to fly equals orbital velocity; often arbitrarily used as boundary between the atmosphere and outer space. This altitude (100 km above the surface of the Earth) is where the gravity starts to weaken. The legally non-binding Karman line was named after T. von Kármán. (4)

Attempts to delimitate outer space**:** As for the scope of application of space law (vs. air law), two schools of thought can be distinguished; the functional approach: the aim/type of the activity that should determine the applicable law; the spatial/conceptual approach: the place of the activity that should determine the applicable law. Despite decades of discussions, no consensus has not yet been found on the definition of delimitation of outer space. (5)

Suborbital flights: follow a parabolic (ballistic) trajectory; Suborbital activities include sounding rockets, ballistic missiles, high-altitude point-to-point passenger transport systems and suborbital space tourist flights.

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(5) Soucek, Alexander: Space Law Essentials, Volume I: Textbook. Neue Praktikerskripten, p. 23.

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