THE DEFINITION AND DELIMITATION OF OUTER SPACE

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Based on "Suborbital Flights For Scientific Missions and/or For Human Transportation"

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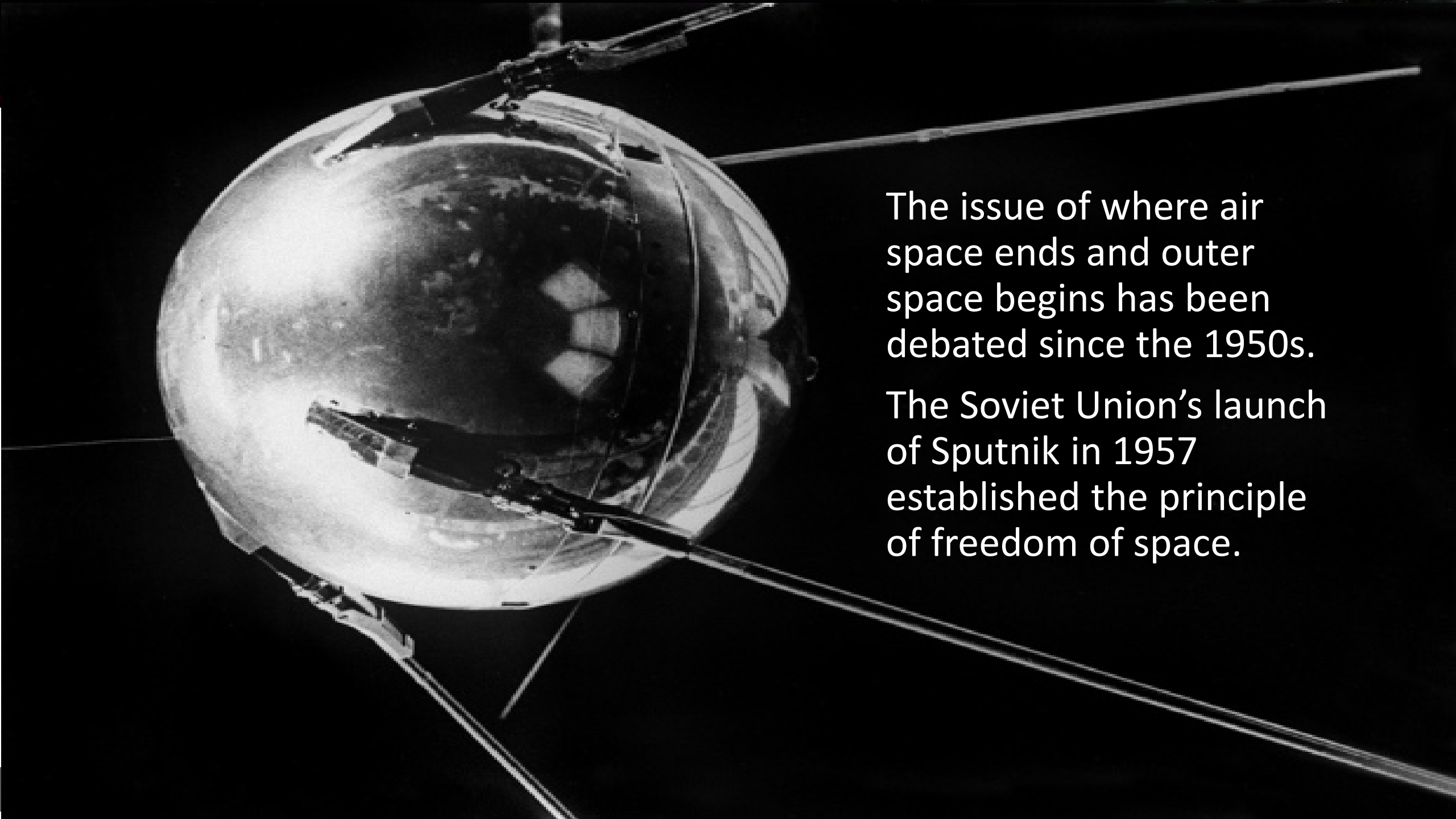


The issue of where air space ends and outer space begins has been debated since the 1950s.

The Soviet Union’s launch of Sputnik in 1957 established the principle of freedom of space.

Why is this issue important?
Air Law and Space Law are governed by vastly different legal regimes

Air Law

1944 Chicago Convention

1929 Warsaw, 1999 Montreal or 1953 Rome Conventions (for liability)

1961 Tokyo Convention and progeny (for security)

Other aviation multilateral & bilateral treaties

Customary international law

National laws and regulations

Space Law

1967 Outer Space Treaty

1968 Rescue Agreement

1972 Liability Convention

1976 Registration Convention

1979 Moon Treaty

Customary international law

National laws and regulations

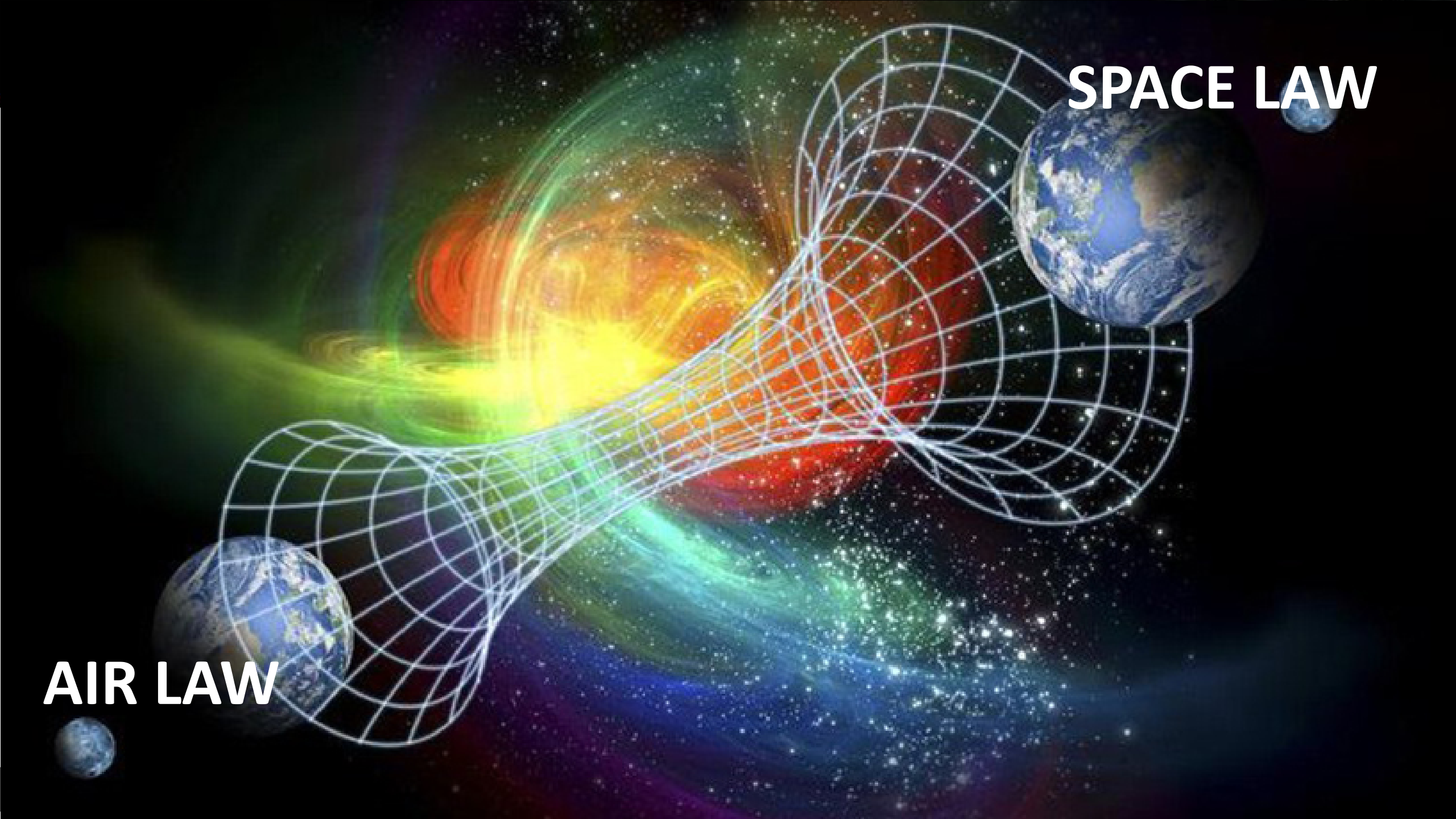
The regimes of both Air Law and of Space Law were developed at a time when the technology for Earth-to-Earth aerospace movements did not yet exist.

Thus, there is not yet a unified or integrated regime of aerospace law.

Moreover, there is significant inconsistency between the regimes of Air Law and Space Law.

Differences in the Air Law/Space Law Regimes

Air Law	Space Law
Applies to “air space”	Applies to “outer space”
Applies to “aircraft”	Applies to “space objects”
States enjoy “complete and exclusive sovereignty” over their territorial air space.	State sovereignty over outer space is prohibited
Imposes liability on the airline, or the aircraft operator	Imposes liability and oversight responsibility upon the State
Requires States to certify and register aircraft, and environmental standards	Creates an international registration regime
Requires States to regulate safety, navigation, and security	No universal safety, navigation or security standards
Requires States to regulate noise and emissions	Environmental standards are “soft law”


SPACE LAW
AIR LAW

Sovereignty in Airspace

Chicago Convention

Art. 1: Every state has "complete and exclusive sovereignty in the airspace above its territory."

Art. 2: Territory includes "the land areas and territorial waters adjacent thereto".

Law of the Sea Convention

Art. 2: "sovereignty extends to the air space over the territorial sea".

Art. 3: Territorial seas extend up to 12 nautical miles from its shores.

Art. 87: "The high seas are open to all States" and includes freedom of overflight.

Sovereignty Restrictions vs. Prohibitions

Chicago Convention

Art 3: No State aircraft may "fly over the territory of a another State" without its permission.

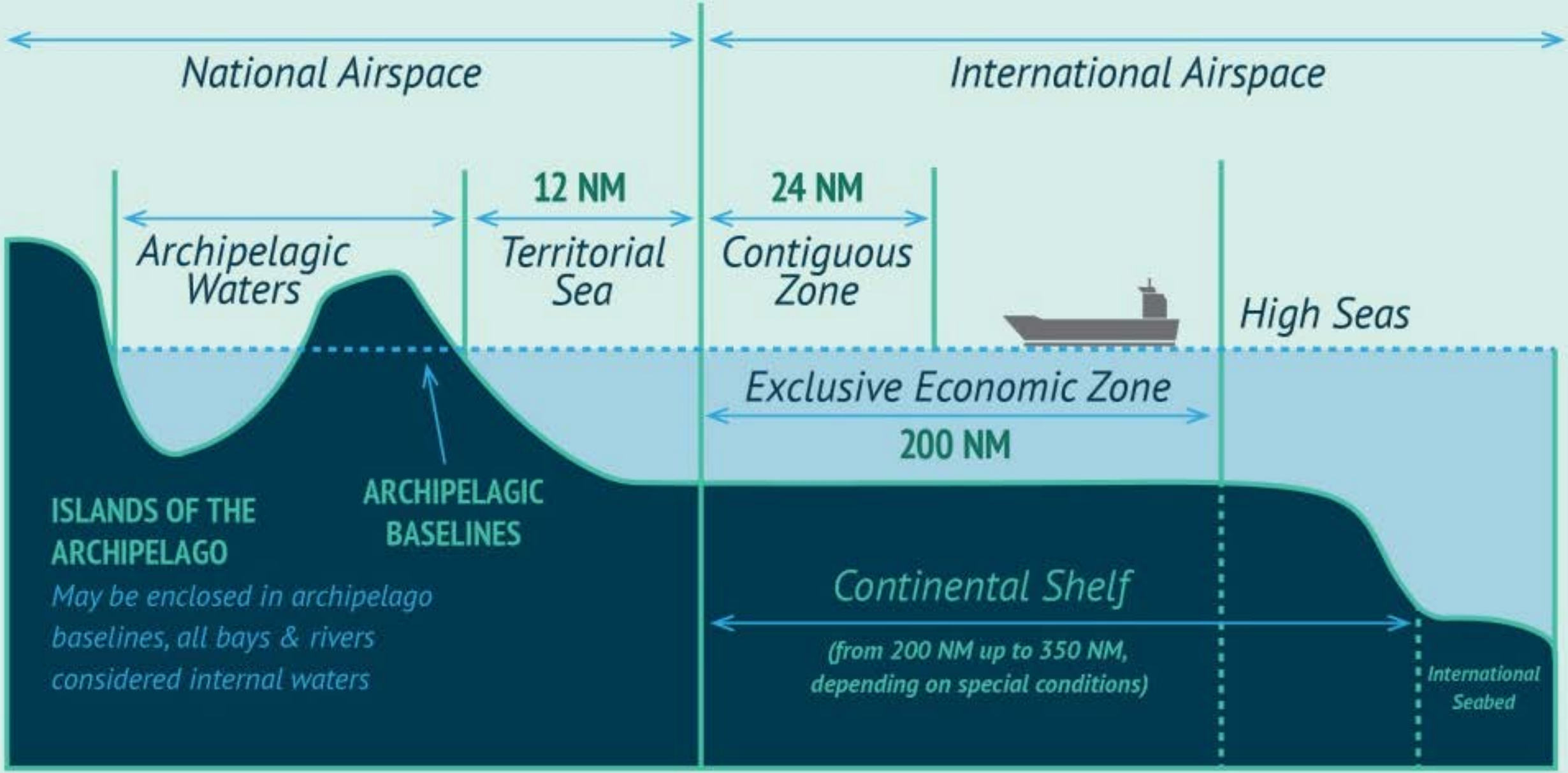
Art. 6: No commercial service may be "operated over or into the territory of another" State without its permission.

Art. 12: "Over the high seas, the rules in force shall be those established" by ICAO.

Outer Space Treaty

Art. 2: Outer space "is not subject to national appropriation by claim of sovereignty".

UNCLOS Maritime and Airspace Zones



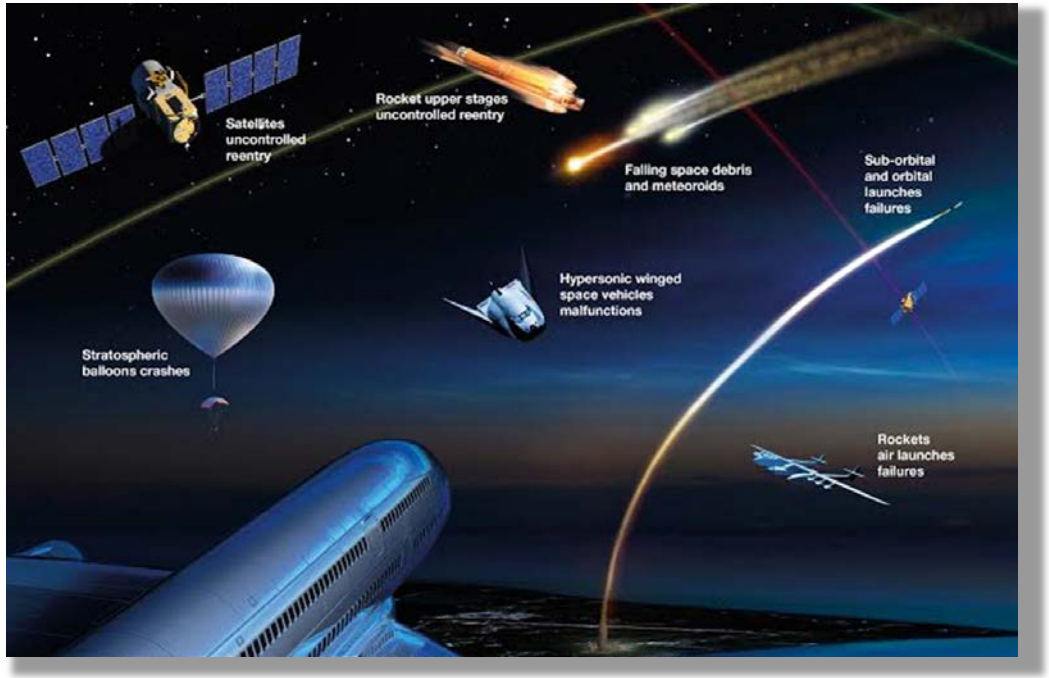
Where does air space end, and outer space begin?

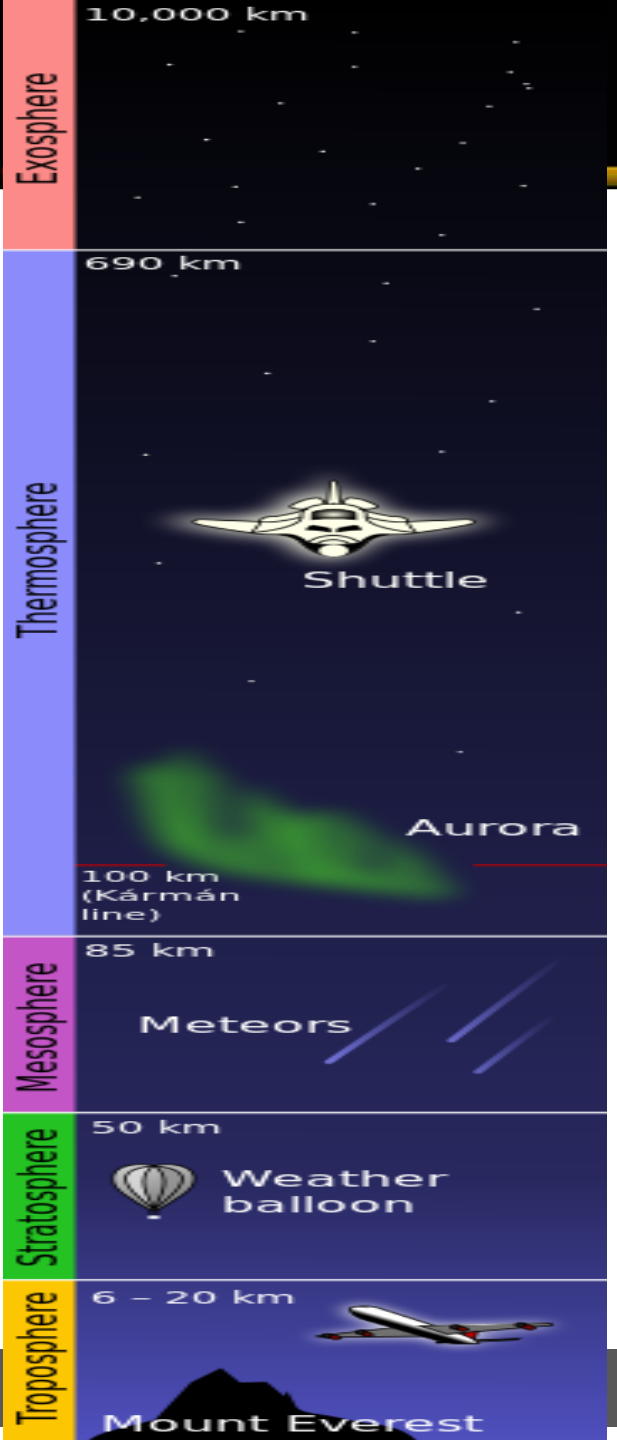
- Neither “air space” nor “outer space” are defined in the relevant treaties.
- Development of suborbital flights would benefit from the delineation of where air space ends and outer space begins.
- Commercial suborbital spaceflights use vehicles that reach an altitude of approximately 100 km, the theoretical line proposed by Theodore von Kármán to separate the fields of aeronautics and astronautics. This line has been recognized by the Fédération Aéronautique Internationale. Australia has also adopted 100km as the jurisdictional limit of its national air space
- But setting the boundary of territorial air space that high would restrict launches to the discretion of the underlying State.

The Emerging “Near-Space” (18-160 km)

Commercial and military interests have begun to develop operating systems in near-space. Such systems include suborbital vehicles, stratospheric balloons, pseudo-satellites and high-altitude drones. Some will few minutes, hours, weeks, months, or years.

Operations in near-space are a potential threat for air traffic beneath and for the public on ground, in case of failures or malfunctions. They are also a threat for space outbound and returning traffic.



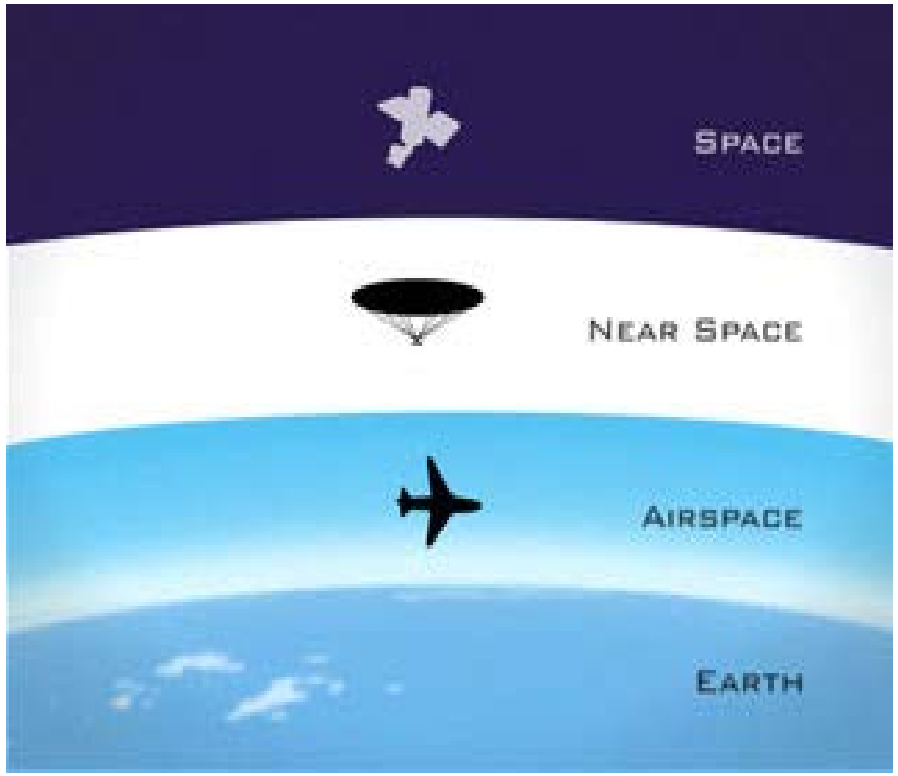


The following operational boundaries exist between aviation and space:

- 160 Km, lowest practical operating orbit for satellites
- 120 Km, re-entry threshold for space systems;
- 50 Km, upper limit of atmospheric buoyancy (balloons)
- 18 km, upper limit of civil aviation traffic

One alternative would be to define the 50-160km region as “near space”, and treat it legally as we do the “high seas”.

Using the jurisdictional zones established by the Law of the Sea Convention as a model, a new treaty, or an amendment to Art. 12 of the Chicago Convention could establish:



The Outer Space Zone, above 120km: subject to Space Law.

The Near Space Zone, 50 – 120km: like the High Seas, open to peaceful use and innocent passage by all, with aerial safety and navigation rules established by ICAO, enforced by States in Flight Information Regions, and whose aerospace and launch vehicles are subject to Air Law.

The Air Space Zone, below 50km: subject to the territorial sovereignty of the underlying State.

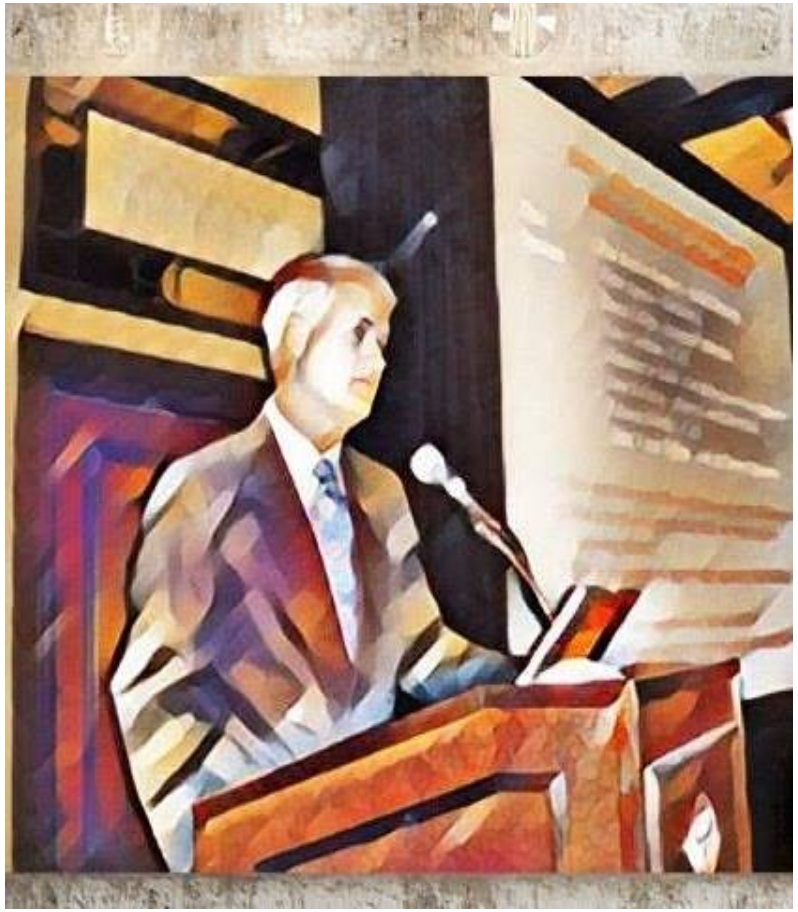
What would be the benefits of legal clarity?

Predictability of outcomes would be enhanced if the question of whether Air Law, or Space Law, or a new regime of “Aerospace Law” applied to suborbital flights.

Commercial development of space would be facilitated by clarity, stability and predictability of law.

Uniformity of law will improve the market’s interest in investment in space transportation, and the insurance industry’s ability to assess and price risk.

Delineation of which legal regime will enhance the margin of safety for aircraft, spacecraft and aerospace vehicles operating in all three zones.



Questions ?

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