



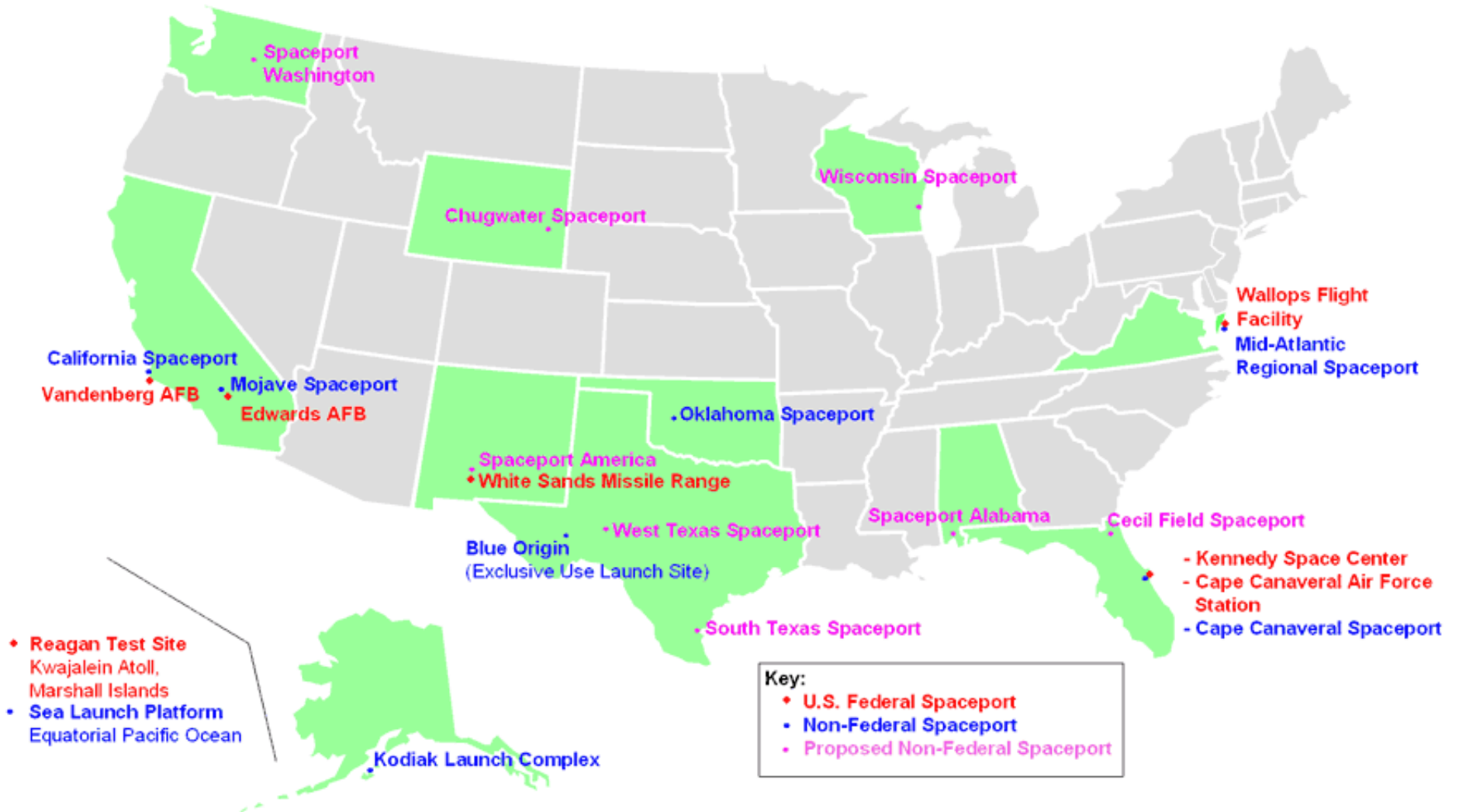
THE LEGAL REGIMES GOVERNING AEROSPACE TRANSPORTATION SYSTEMS

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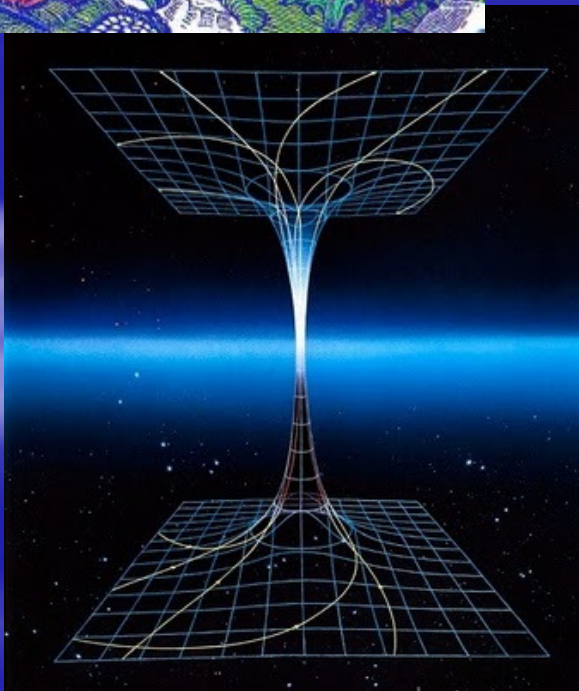
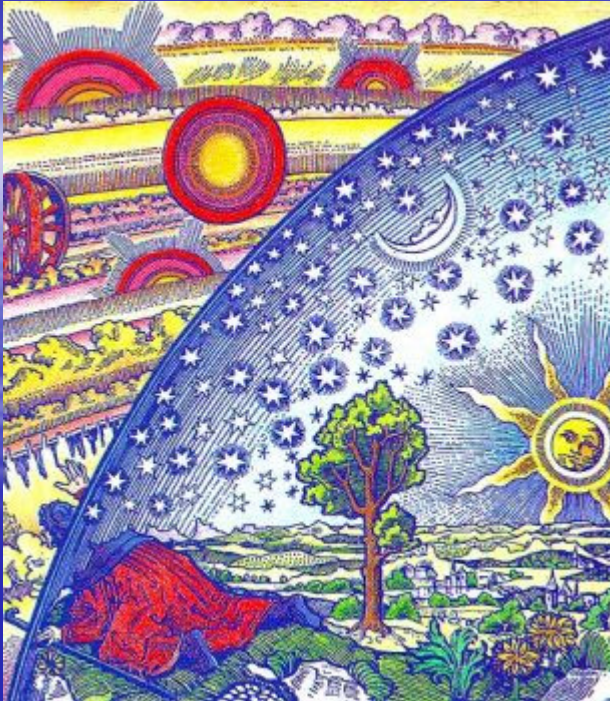


Space transportation is the next logical step beyond space tourism.

U.S. Spaceports



THE PARALLEL UNIVERSES OF AIR LAW AND SPACE LAW



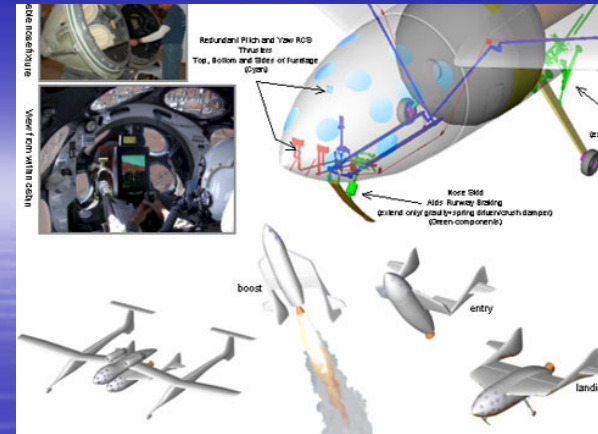
- The existing regimes of Air Law and Space Law were developed at a time when the technology for Earth-to-Earth aerospace movements did not yet exist.
- Thus, there is not yet a unified or integrated regime of Aerospace Law, and there appears to be much inconsistency between the regimes of Air Law and Space Law.

A photograph of an astronaut in a white space suit floating in space. The astronaut is holding a white rectangular sign with blue handwritten text. The background shows the Earth's surface and the structure of a spacecraft.

WHICH LAW APPLIES? AIR LAW OR SPACE LAW?

WE EXAMINE THE
FUNCTIONALIST APPROACH,
AND THE SPATIALIST
APPROACH.

Functionalist vs. Spatialist Approaches

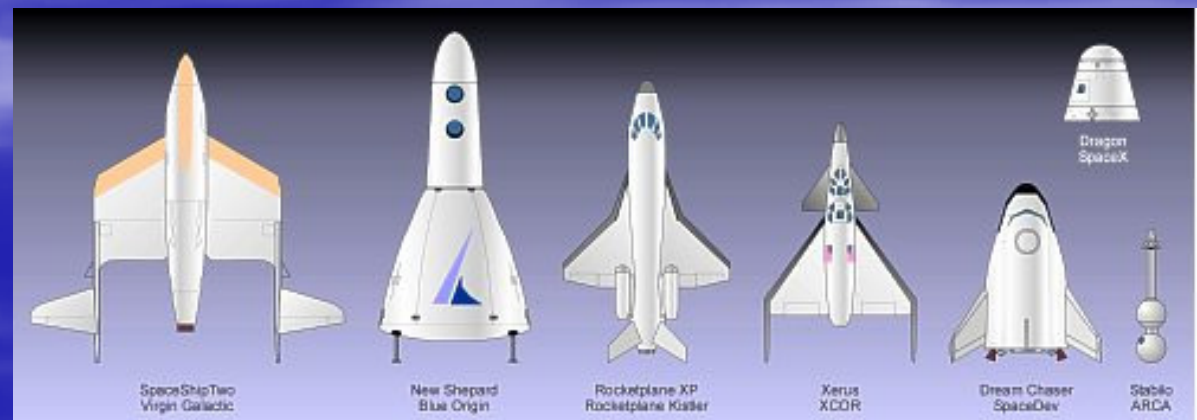


- The “Functionalist” and “Spatialist” approaches have been debated by States and scholars almost since the beginning of the space age.
- That debate long remained ‘academic’ because there was no serious need to resolve the issue. But developments in technology and business are evolving rapidly.
- At the dawn of aerospace transportation, there is a need to ensure safety by avoiding the application of inconsistent regimes to transportation systems operating in the same environment.
- Without uniform rules, the development of aerospace transportation is threatened by the risk of collision.

THE FUNCTIONALIST APPROACH: PRECISELY, WHAT IS IT?



- Is the vehicle an aircraft, a space object, or an aerospace object?
- What is its purpose and function, or its destination? Is it to go into outer space for purposes of orbit, to conduct outer space activities (an Earth-Space mission), or to provide transportation from one point on Earth to another (an Earth-to-Earth mission)?
- What are its technological properties, functional characteristics, design and aerodynamics?





IS IT AN “AIRCRAFT”?

The Chicago Convention does not define the term “aircraft”.

Annex 7 defines *aircraft* as “Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface.”

Under this definition, an aerospace vehicle launched by rocket would not be considered an aircraft on the ascent phase of its flight, but might well on the descent phase.



IS IT A “SPACE OBJECT”

- If the vehicle is a “space object”, presumably Space Law applies to it.
- However, none of the five Space Law Conventions define a “space object”, and none were drafted with any thought given to commercial space transportation.
- Presumably, a spacecraft should be capable of moving in outer space (either orbital or suborbital) without any support from the air, and it would have a power source not dependent upon external oxygen.

IS IT AN “AEROSPACE VEHICLE”?

- What if the space transportation vehicle is a hybrid aerospace object, one capable of achieving lift and thereby flying in airspace (on ascent, descent, or both), and also traveling in outer space?
- Such a vehicle might be considered a space object during its takeoff supported by rockets, and during the weightless portion of its flight through space, then an aircraft during descent and landing.

Problems with the Functionalist Approach

- Because aerospace vehicles share airspace with commercial aircraft, the rules of air safety and navigation must be harmonious.
- Operation under two separate regimes increases the danger of aircraft and aerospace vehicle collision.
- The spatialist approach offers greater certainty as to the legal regime applicable, particularly on the rules of navigation governing commonly used airspace.

THE SPATIALIST APPROACH: PRECISELY, WHERE IS IT?

Territorial Air Space Under Air Law

- The *Chicago Convention* affirms the preexisting customary international law rule that each State enjoys complete and exclusive sovereignty in the airspace above its territory.
- Airspace over territorial seas also belongs to the coastal State.
- Thus, an object flying through territorial airspace would fall under the domestic aviation laws of the underlying State.
- Scheduled international air services may not enter the airspace of a State without its permission, and is subject to any conditions the State may impose.

A satellite photograph of Earth showing a coastline with green land and blue water. The text 'AIRSPACE ABOVE THE HIGH SEAS' is overlaid in a light blue, serif font at the top. Below the title, there are two bullet points in white text with yellow square markers.

AIRSPACE ABOVE THE HIGH SEAS

- Airspace beyond the territorial seas, and above the high seas, is open for use by all.
- However, under the *Chicago Convention*, the rules of safety and navigation governing such airspace are those promulgated by ICAO.



Outer Space

- The *Outer Space Treaty* provides that the “exploration and use of outer space . . . shall be the province of all mankind.”
- It declares outer space to be the common property of mankind, to be used freely “for exploration and use by all States”, and not to be subjected to national appropriation or otherwise subjected to the sovereignty of any State.

Problems with the Spatialist Approach

Make A Reservation Now: Choose to go into outer space and change your inner space forever.

- ROCKETPLANE PRESS AND ANNOUNCEMENTS
 - » WINDOWS VISTA AND AMD SELECT ROCKETPLANE TO SIGN UP FOR FLIGHTS TO SPACE

There is no consensus as to where to draw the line of demarcation between airspace and outer space.

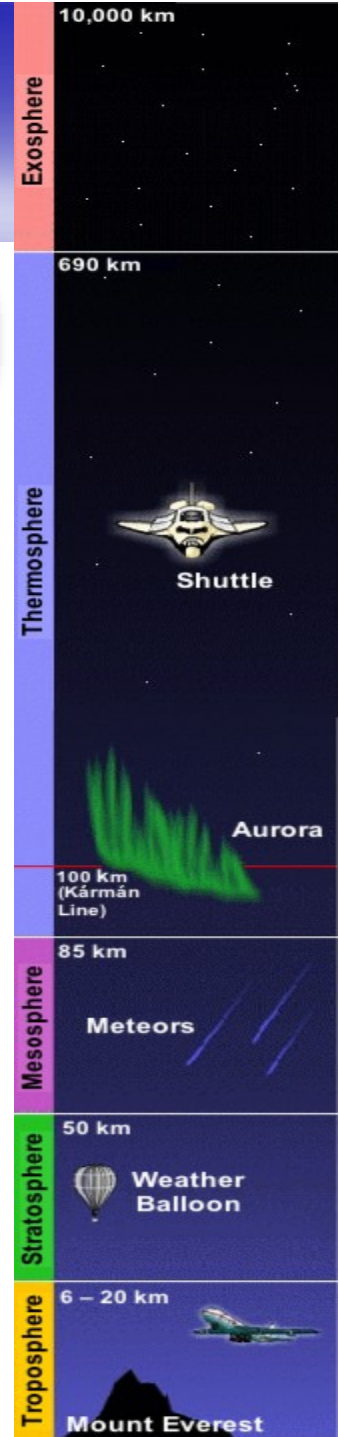
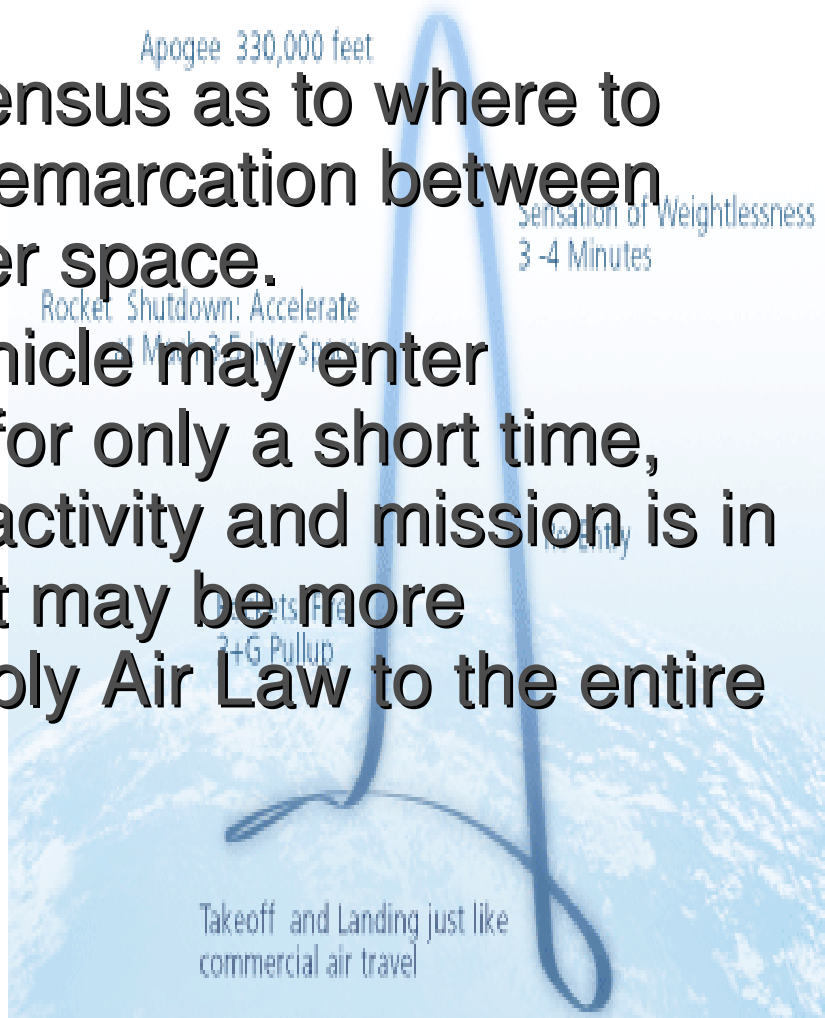
SENSATION OF WEIGHTLESSNESS 3-4 MINUTES
 - » THE ISS: THE FIRST INTERNATIONAL SPACE STATION

An aerospace vehicle may enter suborbital space for only a short time, while its primary activity and mission is in airspace. Thus, it may be more appropriate to apply Air Law to the entire movement.

ROCKET SHUTDOWN: ACCELERATE TO MACH 25 INTO SPACE
 - » IT'S A ROCKETPLANE! IT'S A ROCKETPLANE!

WEIGHTLESSNESS
 - » PRIVATE SPACEFLIGHT INDUSTRY BUILDING TOWARD TAKEOFF

TAKEOFF AND LANDING JUST LIKE COMMERCIAL AIR TRAVEL



WHICH SUBSTANTIVE RULES OF LAW APPLY?

Registration, Safety & Navigation

AIR LAW

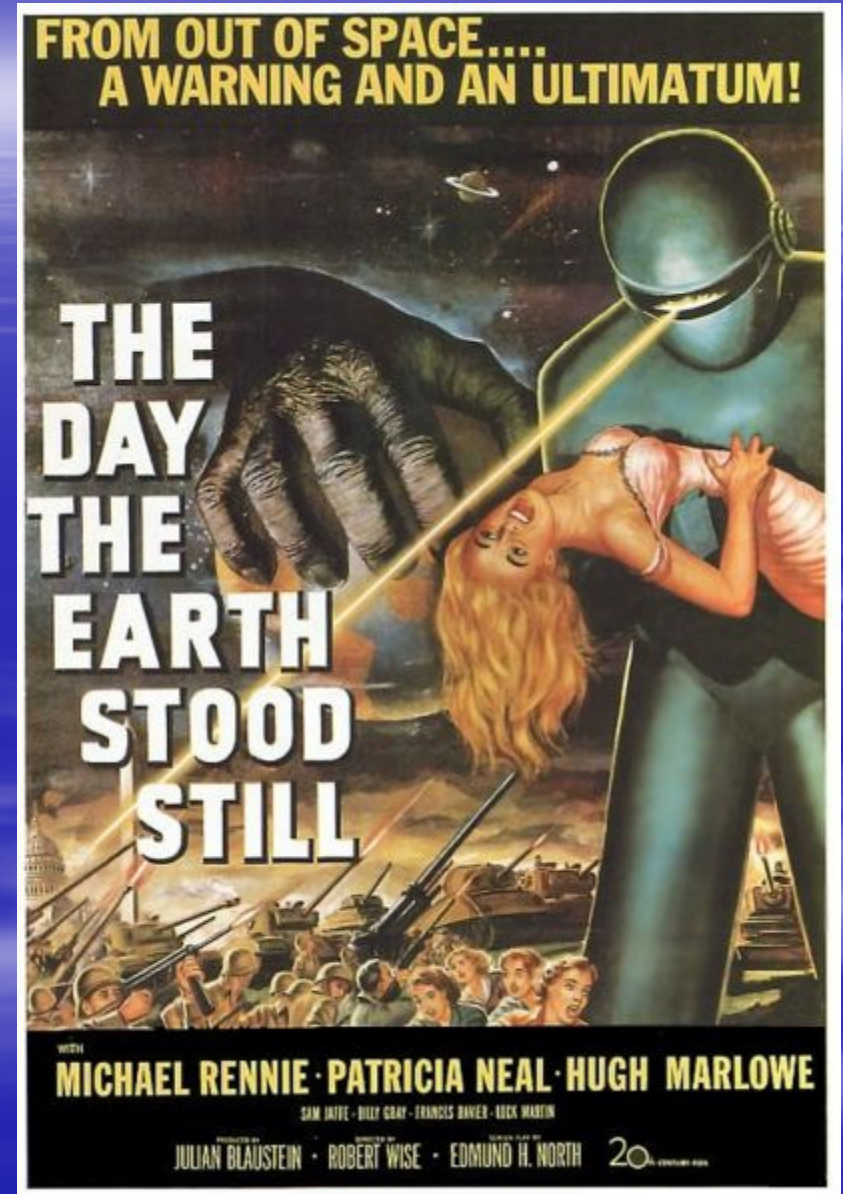
- Under the *Chicago Convention*, aircraft have the nationality of, and remains subject to, the law of the State where it is registered.
- Each State's domestic law determines eligibility and criteria for aircraft registration.
- The registering State has an obligation to ensure that its aircraft observes the rules of air safety and navigation locally in force.

SPACE LAW

- Under the *Registration Convention*, the "launching State" (defined as the State that either launches or procures the launch of a space object, or a State from whose territory or facility such an object is launched) must register the space object in its domestic registry, and with the UN.
- Under the *Outer Space Treaty*, a State on whose registry an object is launched must retain jurisdiction and control over the object and any persons thereon. This enables the State of registry to impose rules and standards related to navigational and personnel safety.

SECURITY

- *The Tokyo Convention of 1963* gives the aircraft commander and crew authority to suppress an unruly or dangerous passenger, and requires that a hijacked aircraft be restored to the aircraft commander and passengers be permitted to continue their journey.
- *The Hague Convention of 1970* declares aircraft hijacking to be an international “offense” and requires the State to which an aircraft is hijacked to extradite or exert jurisdiction over the hijacker and prosecute him, imposing “severe penalties” if he is found guilty.
- *The Montreal Convention of 1971* expands the definition of “offense” to include communications of false information and unlawful acts against aircraft or air navigation facilities, and requires prosecution thereof.
- The term “aircraft” is nowhere defined in these treaties, though they are inapplicable to aircraft used for military, police or customs purposes. Thus, it is unclear whether these treaties apply to aerospace vehicles.
- No comparable international Space Laws governing security exist.



LIABILITY



AIR LAW

- The liability rules of the *Warsaw Convention of 1929*, or the more recent *Montreal Convention of 1999*, apply to the “international carriage” of persons or property by aircraft, though the term “aircraft” is nowhere defined in the treaties.
- Liability is imposed upon the air carrier.
- The *Rome Convention of 1952* governs surface damage by aircraft. Liability of the aircraft operator is limited, based upon the weight of the aircraft.

SPACE LAW

- The Space Law regime places liability upon the State rather than the carrier or aircraft operator, and provides no liability limits.
- The *Outer Space Treaty* provides that a State that launches or procures the launch of an object into outer space, and each State from whose territory or facility a space object is launched, is internationally liable for damage.
- Under the *Liability Convention*, the launching State is absolutely liable for surface damage or to aircraft in flight by a space object.



The ICAO Model

- The ICAO Convention does not apply to State aircraft (including those operated by the military). State aircraft are, however, required to operate with due regard for civil and commercial air traffic. [Strictly speaking, state aircraft are not required to follow air traffic rules. In the vast majority of cases, however, they do because it is in their self interest to do so];
- The ICAO Convention does not generate any prerogative, right or obligation for individual nationals of the contracting States. Only national laws and regulations apply. [*“Each contracting State undertakes to collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures, and organisation...”*]



THE NEED FOR A UNIFIED LEGAL REGIME

- Future transportation systems will be highly influenced by the legal regime in which they are developed. Commercial development of space would be enhanced by clarity, stability and predictability of law. Lack of uniformity of law, and conflicting and overlapping laws will impair the market's interest in investment in space transportation, and the insurance industry's ability to assess and price risk.
- Commercial investment in space transportation systems is expensive, depends on as yet unproved technology, and is fraught with risk. Clear legal rules can help define the degree of risk, and reduce uncertainty, assisting the predictability necessary to support commercial investment.

Recommendations

- COPUOS should remain active at the level of general legal framework for global space activities.
- For the regulation of specific operations, the specialized agencies of the UN should be encouraged to take lead, since they possess extensive experience and expertise.
- In this regard, the ITU's activities related to the regulation of satellite orbits and radio spectrum for space operations have proved quite useful.
- Similarly, ICAO should take lead in overseeing the safety and navigation of aerospace transportation so as to ensure aviation safety.

UN COPOUS
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on behalf of the International Association
for the Advancement of Space Safety