

AIR & SPACE LAW NORMS
GOVERNING SPACE
TRANSPORTATION

by Prof. Dr. Paul Stephen Dempsey

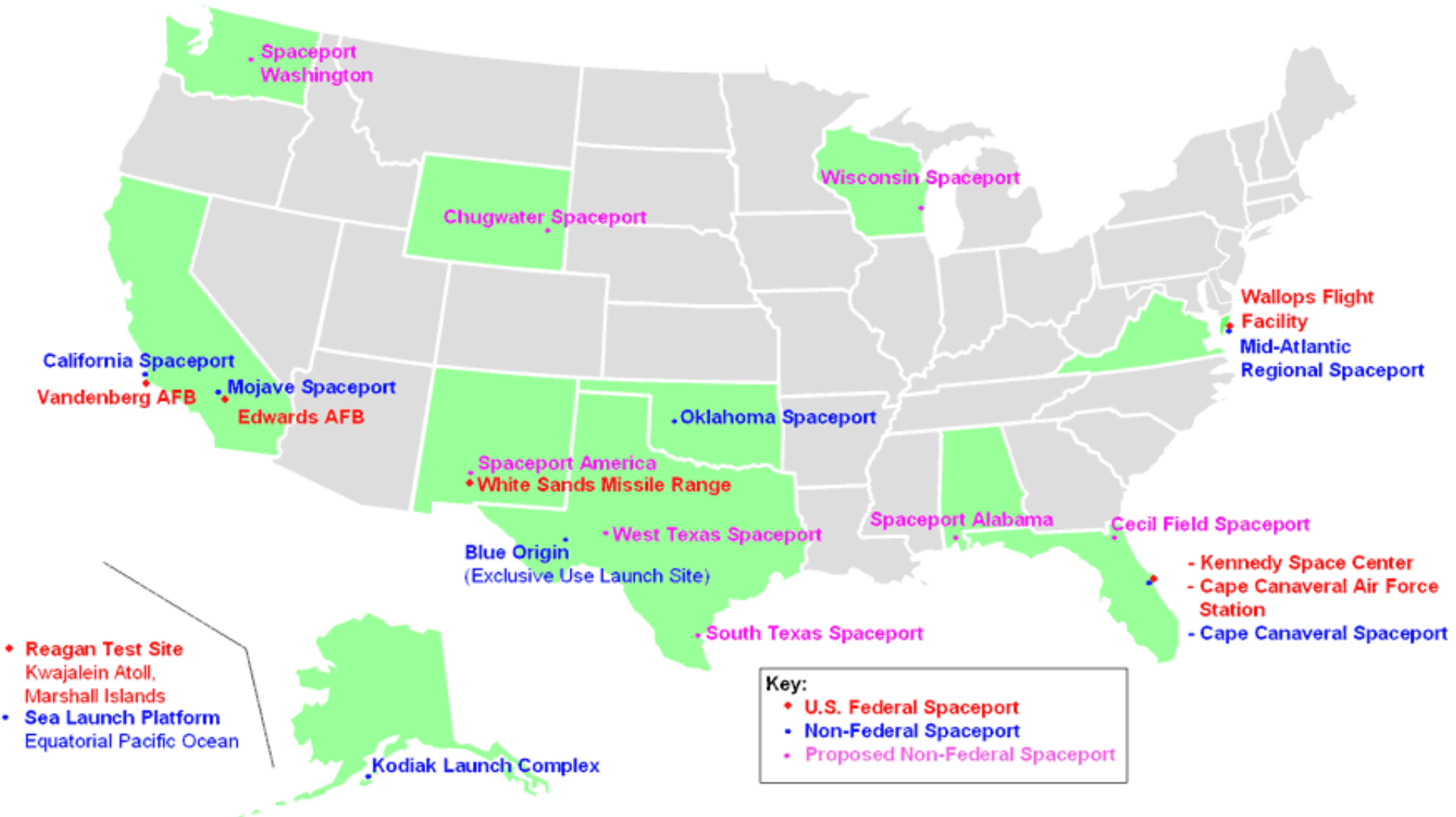
McGill University Institute of Air & Space Law

SPACE
TRANSPORTATION



Space transportation is the next logical step beyond space tourism.

U.S. Spaceports



LACK OF CLARITY IN THE 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 overlap and inconsistency between the regimes of Air Law and Space Law.



FIGURE 52. Orville and Wilbur Wright outside a hangar at Brookham Park, New York, during the Gordon Bennett Race, 1910, in which Alexander Ogilvie took part.

WHICH LAW APPLIES? AIR LAW OR SPACE LAW?

WE EXAMINE THE
FUNCTIONALIST APPROACH,
AND THE SPATIALIST
APPROACH.

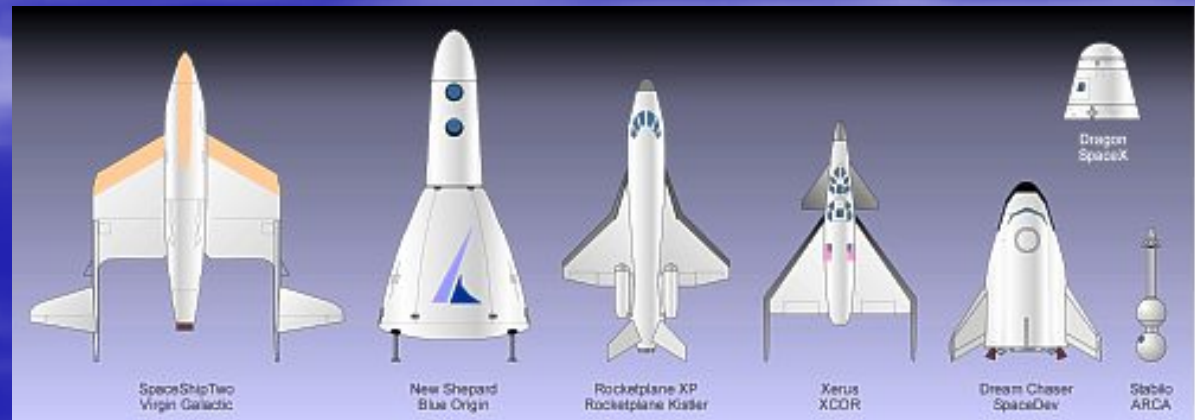
A photograph of an astronaut in a white spacesuit floating in space. The astronaut is holding a white rectangular sign with blue handwritten text. The sign reads "I love SPACE LAW PROBE!". The background shows the structure of a spacecraft and the Earth's surface below.

I love
SPACE LAW
PROBE!

THE FUNCTIONALIST APPROACH: WHAT IS IT?



- Is the vehicle an aircraft, a space object, or an aerospace object?
- One way to answer this question is to identify its purpose and function, or its destination. Is the vehicle's primary purpose to go into outer space for purposes of orbit, the conduct of outer space activities (an Earth-Space mission), or to provide transportation from one point on Earth to another (an Earth-to-Earth mission)?
- Another approach is to consider the technological properties, functional characteristics, design and aerodynamics of the vehicle. Is it capable of acquiring lift through the air, for example?





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 precisely what is 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.
- If they operate under two separate regimes, the danger of aircraft and aerospace vehicle collision arises.
- Moreover, 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: 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 subject to any conditions the State may impose.

AIRSPACE ABOVE THE HIGH SEAS

A satellite view of Earth from space, showing the curvature of the planet and the blue oceans. The image is used as a background for the text. The title 'AIRSPACE ABOVE THE HIGH SEAS' is written in a large, blue, serif font at the top. Below it, there are two bullet points in white text with a yellow square marker. The background shows a mix of blue water, green land, and white clouds.

- Airspace beyond the territorial seas, and above the high seas, is open for use by all.
- However, under the *Chicago Convention*, the rules 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.
- Hence, outer space is free for use by all.

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

- **There is no consensus as to where to draw the line of demarcation between airspace and outer space.**
 - » WINDOWS VISTA AND AMD SELECT ROCKETPLANE TO SIGNIFY OUR SPACE PRESS RELEASE, JANUARY 2007
- **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.**
 - » THE ISSUING OF A RELEASE ON AEROSPACE VEHICLE PRESS RELEASE, JANUARY 2007
 - » IT'S A ROCKETPLANE... IT'S A PLANE... IT'S A ROCKETPLANE! POPULAR MECHANICS, FEBRUARY 2007
 - » PRIVATE SPACEFLIGHT INDUSTRY BUILDING TOWARD TAKEOFF AVIATION WEEK, DECEMBER 2006

Apogee 330,000 feet

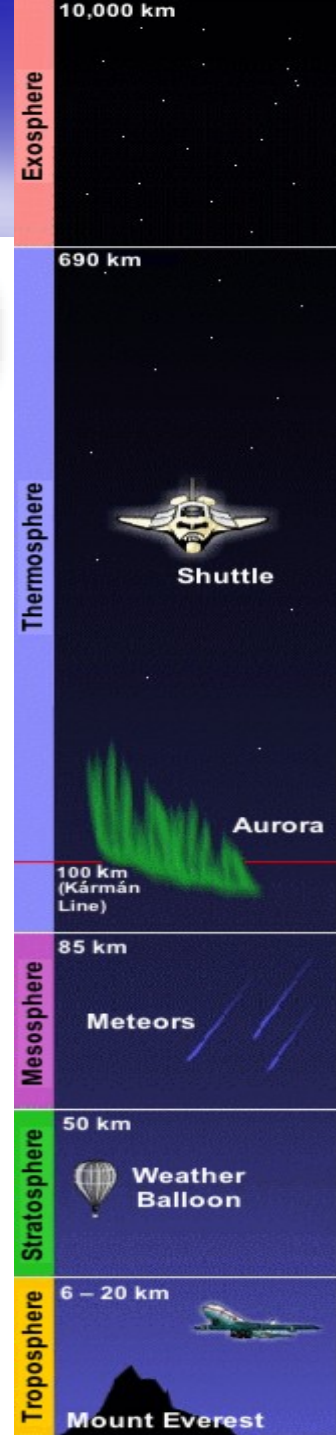
Sensation of Weightlessness
3 -4 Minutes

Rocket Shutdown: Accelerate

at Mach 2.5 into Space

3-G Pullup

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.
- To promote uniformity, States are obliged to promulgate domestic aviation laws consistent with ICAO SARPs, unless it is impracticable to do so.

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) of a space object must register the object in its domestic registry, and with the United Nations.
- 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.

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.
- International carriage is defined as transportation between two State Parties to the convention, or between two points in the same State Party where an agreed stopping point is in another State.
- The *Rome Convention of 1952* governs surface damage by aircraft. Liability to the owner or operator of the aircraft is limited, based upon the weight of the aircraft

SPACE LAW

- The Space Law regime places liability upon the State rather than the carrier, and provides no liability limits.
- The *Outer Space Treaty* provides that any 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 absolute liable for surface damage or to aircraft flight by a space object.



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, or consequences, of risk, and reduce uncertainty, providing the predictability necessary to support commercial investment. Conversely, legal uncertainty can increase risk and dampen enthusiasm for investment.

A large passenger airplane is shown on a runway, with a city skyline visible in the background. The airplane is white with blue and red accents. The city skyline includes several tall buildings, including the CN Tower. The sky is clear and blue. The runway has red and white markings.

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