Space policy and politics

MAE 4160, 4161, 5160

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Today’s topics:

- Types of space law
- Historical context
- International space treaties
  - 1967 Outer Space Treaty
  - 1968 Rescue and Return Agreement
  - 1972 Liability Convention
  - 1976 Registration Convention
  - 1979 Moon Agreement
- 2014 Asteroid Act
- Additional foundations, communications, and export control
- Space Force

Types of space law

Binding (to Parties*)

- UN treaties and conventions
- Rules and regulations by international organizations (e.g. ITU)
- International government agreements (e.g. Space Freedom)
- National space laws

Non-binding

- UN principles, resolutions, and guidelines
- Customary international law (e.g. free access to space)

***Parties are States who ratify a treaty. States who sign a treaty (signatories) may not ratify it — ratification requires implementing instructions such as domestic laws.**

Origin of international space law

- The context: Cold War
- 1957-58: Antarctic Treaty (Antarctica)
  - Similar to Outer Space Treaty
- 1957: Sputnik I orbits over many territories. No State formally voices a complaint or breach of sovereignty.
- 1963: UN resolution for non-appropriation of outer space
- 1967-1979: The 5 Space Treaties

International space treaties

1. 1967 Outer Space Treaty (102 ratifications)
2. 1968 Rescue and Return Agreement (92)
3. 1972 Liability Convention (89)
4. 1976 Registration Convention (60)
5. 1979 Moon Agreement (15)

International space treaties

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Expand upon 1.

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Outer space treaty (1967)

- “Treaty on principles governing the activities of states in the exploration and use of outer space, including the Moon and other celestial bodies.”
- Magna Carta of international space law
- 17 articles lay out basic principles for use of outer space
    - Common interest
    - Freedom of use and exploration
    - Non-appropriation
    - Peaceful purposes
    - State responsibility
    - Liability for damage caused by space objects
    - Registration and jurisdiction

Outer space treaty: some highlights

- Article IV: **No nuclear weapons** or any other weapon of mass destruction *in orbit* or *on celestial bodies*.
- Article V: Astronauts are **envoys of mankind**. When landing in the territory of another State, they shall be assisted and safely and promptly returned.
- Article IX: A State Party to the Treaty which has reason to believe that an activity or experiment planned by another State Party in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the moon and other celestial bodies, may request consultation concerning the activity or experiment. ← **Remember the West Ford Needles?**
- Article XII: All stations, installations, equipment, and space vehicles on the Moon and other celestial bodies shall be **open to representatives** of other State Parties.

Outer space treaty: some examples

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   - Yes, as long as those weapons are not weapons of mass destruction.

Rescue Agreement (1968)

- Elaborates upon Article V of the Outer Space Treaty
- Provides that **any state that is a party to the agreement** must provide **all possible assistance to rescue the personnel of a spacecraft** who have landed within that state's territory, whether because of an accident, distress, emergency, or unintended landing. If the distress occurs in an area that is beyond the territory of any nation, then any state party that is in a position to do so shall, if necessary, extend assistance in the search and rescue operation.
- Changes from the OST
  - Replaces “astronaut” with “personnel of a spacecraft” in order to anticipate space tourism
  - Compensation for the recovery of space objects (but doesn’t say anything about astronauts)
- Generally vague and not useful

Liability Convention (1972)

- “Convention on International Liability for Damage Caused by Space Objects”
  - Ratified by 89
- Expands on the liability rules created by the Outer Space Treaty
- If damage is caused by the space object on the **surface of the Earth or to aircraft**, the liability to compensate is absolute (i.e., **no need to prove fault**)
- If damage is caused to **another space object**, the launching State is liable only if the damage is **due to fault on the part of the launching State**
  - Launching State: State that launches the space object, procures the launch, from whose territory/facility is launched (e.g., who is it when a Nigerian satellite is launched on a Soyuz from Kourou?)

https://www.thespacereview.com/article/2588/1

Liability Convention: some questions

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   - Fault or intentional damage needs to be proven.

Liability Convention: claims and potential applications

- Only 1 claim: 1978 USSR COSMOS 954 reenters in Canada
  - Satellite contained a nuclear reactor — left radioactive debris
  - Liability convention not activated. Solved diplomatically. Canada claimed $6M (Canadian), actually spent $14M. USSR paid $3M.
- 1996 French satellite Cerise collides with Ariane debris
- 2007 Chinese ASAT test against its own satellite
- 2009 US Comsat (Iridium 33) destroyed by dead Russian military satellites
  - No claim
  - 2012: ISS astronauts take refuge inside the two docked Soyuz rendezvous spacecraft as a small piece of Cosmos 2251 satellite debris passed within 120m of ISS
- 2013 Russian sat hit by Chinese debris (from ASAT)
  - No claim

Liability Convention: claims and potential applications

Point of collision

Debris fields after 20 minutes

Debris fields after 50 minutes

Registration Convention (1976)

- **National registration**: the launching State must register its space objects in its national register
- **International registration**: the launching State must inform the UN Secretary General about its launched space object so that it can be registered in the UN register
- **Information**: name of launching State or States, designator or registration number, date and location of launch, general function, basic orbital parameters

The Moon Agreement (1979)

- “Agreement Governing the Activity of States on the Moon and Other Celestial Bodies”
  - Ratified by 15 States, **excluding** all major space-faring nations
- Proposed an international agency that would govern how natural resources on the Moon and other celestial bodies could be gathered by States
- Bans militarization of Moon or other celestial bodies
- Enforces equitable sharing of all benefits derived from lunar natural resources

Arguments in favor

- Prevents a company/State from attaining monopoly position in world minerals market

Arguments against

- Disincentivizes commercial space exploration.

UN space resolutions (non-binding)

- 1963 Legal Principles Governing Exploration and Use of Outer Space
- 1982 Principles of Direct Broadcasting by Satellites
- 1986 Remote Sensing by Satellites
- 1993 Use of Nuclear Power Sources in Space
- 2000 Space Exploration and the Needs of Developing Countries

International agreements

- Space Station Agreement (1998)
  - USA, Russia, Canada, Japan, 10 EU member states
  - Each party retains jurisdiction and control over the elements it registers and over national personnel in ISS
    - European states treated as one entity, but each State can extend its national laws to the module and its nationals
  - Cross-waiver of liability between partners.

National space laws

- Argentina, Australia, Canada, Finland, France, Germany, Hungary, Indonesia, Japan, New Zealand, the Philippines, Republic of Korea, Russian Federation, Slovakia, Sweden, South Africa, Tunisia, Ukraine, the United Kingdom, and the USA have adopted national space laws
- Heterogeneous across countries
- USA has by far the most laws and regulations

Recent example: The US Space Act

- On July 10 2014, Mr. Posey and Mr. Kilmer introduced the following bill (ASTEROIDS Act):
  - “To promote the development of a commercial asteroid resources industry for outer space in the US and to increase the exploration and utilization of asteroid resources in outer space.”
  - “Any resources obtained in outer space from an asteroid are the property of the entity that obtained such resources, which shall be entitled to all property rights thereto, consistent with applicable provisions of Federal law.”
- After lobbying from Planetary Resources, Bigelow, and others, this bill was eventually rolled into the SPACE Act (November 2015)
  - Allows US citizens to “engage in the commercial exploration and exploitation of ‘space resources’ [including water and minerals]”
  - Biological life not included

113TH CONGRESS
2D SESSION

H. R. 5063

To promote the development of a commercial asteroid resources industry for outer space in the United States and to increase the exploration and utilization of asteroid resources in outer space.

IN THE HOUSE OF REPRESENTATIVES

JULY 10, 2014

Mr. POSEY (for himself and Mr. KILMER) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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A BILL

To promote the development of a commercial asteroid resources industry for outer space in the United States and to increase the exploration and utilization of asteroid resources in outer space.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "American Space Technology for Exploring Resource Opportunities In Deep Space Act" or the "ASTEROIDS Act".

"§ 51302. Legal framework

"(a) PROPERTY RIGHTS.—Any resources obtained in outer space from an asteroid are the property of the entity that obtained such resources, which shall be entitled to all property rights thereto, consistent with applicable provisions of Federal law.

Orbital debris

- Aka Space Debris, Space Junk
- Over 29,000 objects tracked by US (>10cm)
- “Space Situational Awareness” (SSA) refers to all the sensing activities that could identify and track orbital debris
- Kessler Syndrome
- Current US Space Policy:
    - “The United States shall take a leadership role in international fora to encourage foreign nations and international organizations to adopt policies and practices aimed at debris minimization and shall cooperate in the exchange of information on debris research and the identification of improved debris mitigation practices."

Satellite Communications Law

- International Telecommunications Union (ITU) regulates the use of satellites frequencies and (indirectly) orbits
    - Avoid interference to other satellites
- ITU has limited enforcement mechanisms
- FCC assigns specific frequencies to US satellites
- US companies must apply to the FCC for a license to construct, launch, and operate a satellite

Remote sensing law

- Under 1967 Outer Space Treaty, countries can’t object to being imaged
- Publicly available imagery down to about 50cm resolution
- As per the 19992 Land Remote Sensing Policy Act: the National Oceanic and Atmospheric Administration (NOAA) licenses the operations of private space-based remote sensing operations
- Kyl-Bingaman Amendment: Can’t collect imagery over Israel at better resolution than commercially available in Israel

Export control

- USA, China, India, Russia, Japan and others (including EU) have export control regulations.
- Why export control?
  - National security concerns
  - Prevent proliferation of weapons of mass destruction and missile delivery systems
  - Restrict exports of goods/technologies that could contribute to military potential of adversaries/rogue countries
  - Traceability of transactions

US Export control overview

Export Administration Act

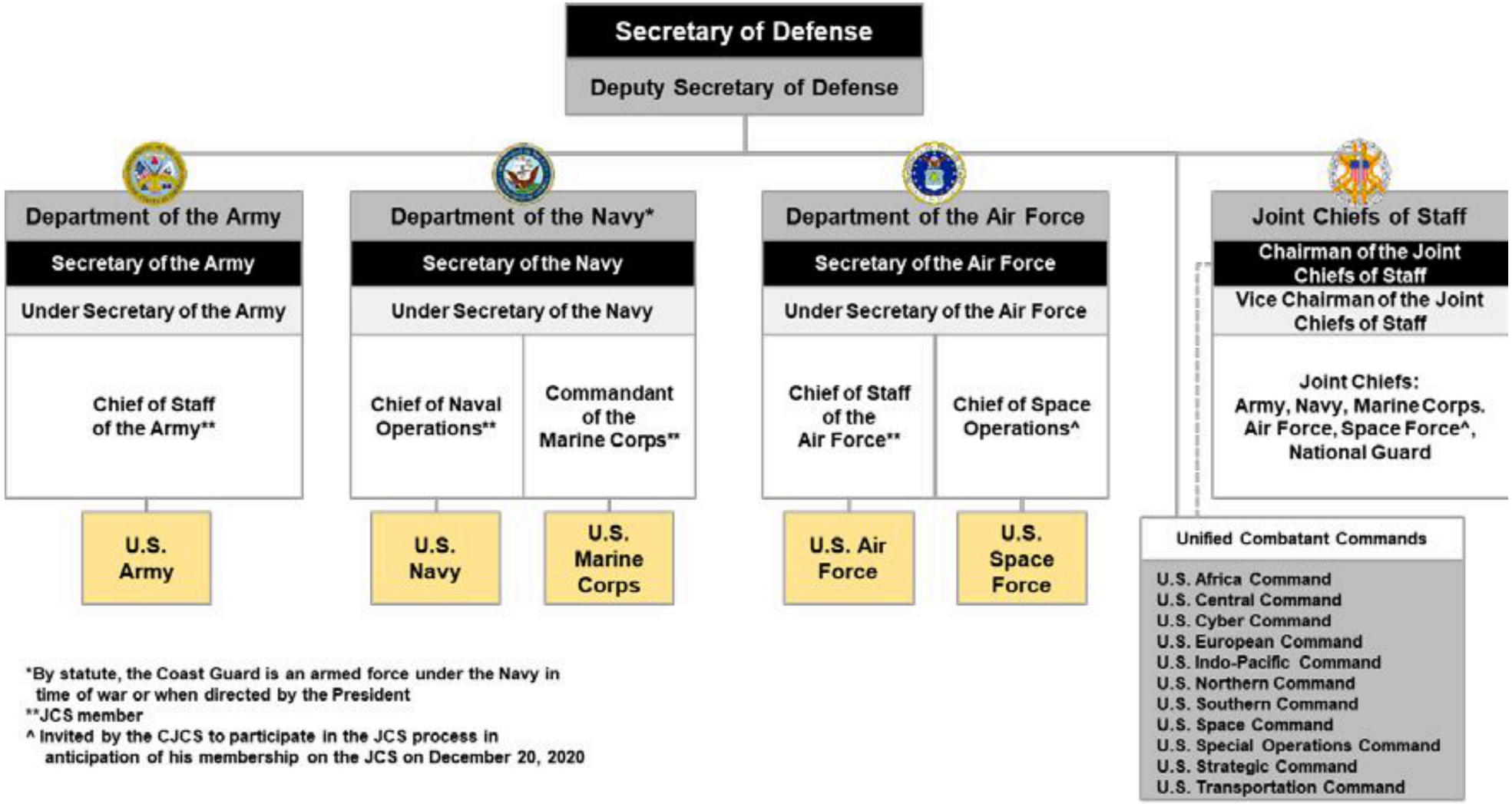
- “Dual-Use Items” listed in Export Administrations Regulations (EAR)
- Administered by the department of commerce

Arms Export Control Act (AECA)

- Controls export of “munition items” listed in the International Traffic in Arms Regulations (ITAR) and release of related technical data
- Administered by Department of State
- ITAR has resulted in loss of billions of dollars for the US
- 1994-2014: Satellites, rockets, space electronics and guidance equipments are munitions and therefore belong on the US Munitions List of items whose export is controlled by the Department of State
- As of late 2014, ITAR has changed so that most space tech is on the Commerce Controlled List (i.e., no longer military technology)

United States Space Force

How the Space Force fits into the Department of Defense



*By statute, the Coast Guard is an armed force under the Navy in time of war or when directed by the President
**JCS member
^ Invited by the CJCS to participate in the JCS process in anticipation of his membership on the JCS on December 20, 2020

Brief history

- Military space activities began right after WWII. In 1946, von Kármán was instructed to investigate the feasibility of satellites for reconnaissance. This study was remarkably prescient
- 1947: Air Force gains independence
- 1961: Robert McNamara designated the Air Force as the lead military service for space (was previously divided among Army, Air Force, Navy, and newly-formed NASA)
- 1970's: GPS, Defense Satellite Communications System, Defense Support Program missile warning satellites
- 1980's: Air force realizes that it is insufficiently organized for military space operations (assets spread across Strategic Air Command, Air Force Systems Command, Aerospace Defense Center, and Air Staff). Created the **Air Force Space Command** to centralize all space operations.
- 2001: The idea for independence starts being considered. The Space Commission states that the Air Force treated space operations as secondary to air operations, and recommended the creation of a space corps within the Air Force
- 2017: A bipartisan proposal to create a US Space Corps was put forward by Mike Rogers and Jim Cooper in specific response to the Air Force's secondary treatment of space operations to air dominance. Passed the House, cut from the bill in the Senate.
- 2020: President Trump signs the 2020 National Defense Authorization Act, creating the Space Force as the sixth armed services branch

Mission, functions, and duties

Mission

- Space superiority
- Space domain awareness
- Offensive and defensive space control
- Command and control of space forces and satellite operations
- Space support to operations
- Space service support
- Space support to nuclear command, control, communications, and nuclear detonation detection
- Missile warning and space support to missile defense operations

Functions

- Provide freedom of operation for the United States in, from, and to space
- Provide prompt and sustained space operations

Duties

- Protect the interests of the United States in space
- Deter aggression in, from, and to space
- Conduct space operations

Summary

Outer Space Treaty established main principles of space law

- Common interest
- Freedom of use and exploration
- Non-appropriation
- Peaceful purposes
- State responsibility
- Liability for damage caused by space objects
- Registration and jurisdiction

4 other space treaties expand on OST

- Rescue and return agreement
- Liability convention
- Registration convention
- Moon agreement

- Other international regulations and agreements: frequency allocation, Space Station
- Export control laws
- Space Force