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# What is a Celestial Body?

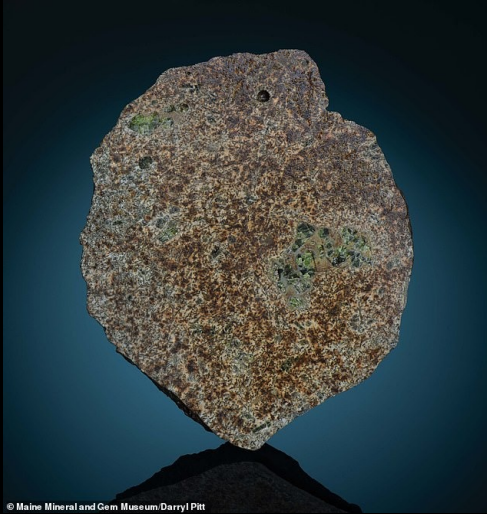
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June 9, 2022



# Celestial Bodies? (Images Not to Scale)



Oldest Meteorite on Earth



Comet Wild 2



Oumuamua



Moon



# The Questions Posed

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- Does the prohibition of Article II extend to the collection of dust particles or other special elements during flight in outer space?
- Does the prohibition extend to the appropriation of cosmic rays, gases or the sun's energy, or to the collecting of mineral samples or precious metals on the Moon or other celestial bodies?
- Should the answer depend on the type of resource involved, or on its availability in unlimited (cosmic rays, meteorites, gases) or limited (minerals, metals) quantities or perhaps on its location?

~ Stephen Gorove, 1969



# Agenda

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- Why Does It Matter?
  - *Legal Backdrop*
  - *Article II*
- Some Theories
- Solution?





WHY DOES IT MATTER?



# Outer Space Treaty – Article I

- The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be *the province of all [hu]mankind*.
- Outer space, including the moon and other celestial bodies, shall be *free for exploration and use* by all States without discrimination of any kind, on a basis of equality and in accordance with international law, *and there shall be free access to all areas of celestial bodies*.



# Outer Space Treaty – Article II

- Outer space, **including the Moon and other celestial bodies**, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.





# Outer Space Treaty – Article VI

- Article VI states that nations shall bear international responsibility for national activities in outer space, whether such activities are carried on by governmental agencies, *or by non-governmental entities*, and for assuring that *national activities* are carried out in conformity with the provisions set forth in the present Treaty
- The activities of non-governmental entities in outer space shall require both *authorization and continuing supervision* by appropriate State party.





# Outer Space Treaty – Article II

- Outer space, **including the Moon and other celestial bodies**, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.
  - *National Appropriation, Sovereignty*
    - Declaration of Human Rights, Article 17
- “an individual acting on his [or her] own behalf or on behalf of another individual or a private association or an international organization could lawfully appropriate any part of outer space, including the moon and other celestial bodies.” Gorove.



# Moon Agreement

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- Article 11(1): The Moon and its natural resources are the common heritage of [hu]mankind.
- Article 11(3): Neither the surface nor the subsurface of the Moon, nor any part thereof or natural resources in place, shall become the property of any State, international intergovernmental or nongovernmental organization, national organization or nongovernmental entity or of any natural person.
- Article 11(5): States Parties to this Agreement hereby undertake to establish and international regime, including appropriate procedures, to govern the exploitation of the natural resources of the Moon as such exploitation is about to become feasible.



# Executive Order on Encouraging International Support for the Recovery and Use of Space Resources (April 6, 2020)

- The United States does not consider the Moon Agreement to be an effective or necessary instrument to guide nation states regarding the promotion of commercial participation in the long-term exploration, scientific discovery, and use of the Moon, Mars, or other celestial bodies. Accordingly, The Secretary of State shall object to any attempt by any other state or international organization to treat the Moon Agreement as reflecting or otherwise expressing customary international law.



# US Law

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- A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.
- 51 USC § 51303



# Executive Order on Encouraging International Support for the Recovery and Use of Space Resources (April 6, 2020)

- Americans should have the right to engage in commercial exploration, recovery, and use of resources in outer space, consistent with applicable law. Outer space is a legally and physically unique domain of human activity, **and the United States does not view it as a global commons**. Accordingly, it shall be the policy of the United States to encourage international support for the public and private recovery and use of resources in outer space, consistent with applicable law.



# Lunar Regolith Purchase Request Performance Work Statement (Sep. 10, 2020)

- 1. Objective/Requirements
  - *NASA is purchasing a quantity of Lunar regolith material from the Contractor. The NASA requirements are as stated in this Performance Work Statement (PWS).*
- 2A. The Contractor shall:
  - *1. Collect from 50g up to 500g of Lunar regolith and/or rock materials ("Collected Material") from the surface of the Moon (Luna).*

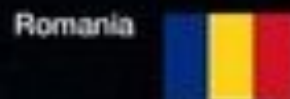
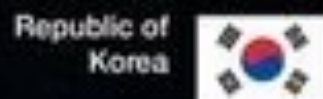
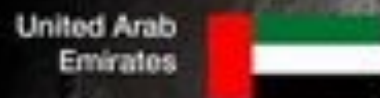
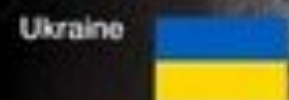
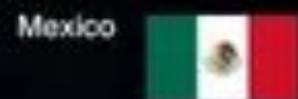




Credit NASA



# ARTEMIS ACCORDS



United for Peaceful Exploration of Deep Space



# Section 10 – Space Resources

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- 1. The Signatories note that the utilization of space resources **can benefit humankind by providing critical support for safe and sustainable operations.**
- 2. The Signatories emphasize that the extraction and utilization of space resources, including any recovery from the surface or subsurface of the Moon, Mars, comets, or asteroids, **should be executed in a manner that complies with the Outer Space Treaty** and in support of safe and sustainable space activities. **The Signatories affirm that the extraction of space resources does not inherently constitute national appropriation under Article II of the Outer Space Treaty,** and that contracts and other legal instruments relating to space resources should be **consistent with that Treaty.**



# International Response

- Vancouver Institute
- UNCOPUOS Working Group on Legal Aspects of Space Resource Activities (five years).
- Russia/China Moon Base
- Luxembourg, UAE, Japan



# Why Does it Matter?

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- The literature contains serious and constructive contributions to establishing legal frameworks and guidelines for the exploration, naming, and use of “Celestial Bodies,” but without a definition, much of the legal architecture remains troublingly vague.
  - *Uncertainty of interpretation of Article II.*
  - *Enhance certainty by preventing absurd claims made frivolously or for the sole purpose of nuisance.*
  - *Reduce potential for conflict.*





# SOME THEORIES



# Working Group III

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- International Institute of Space Law
- “On the Legal Status of Celestial Bodies”
  - *"natural objects in outer space including their eventual gaseous corona which cannot be artificially moved from their natural orbits"*
- Never settled on a definition.



# UNCLOS

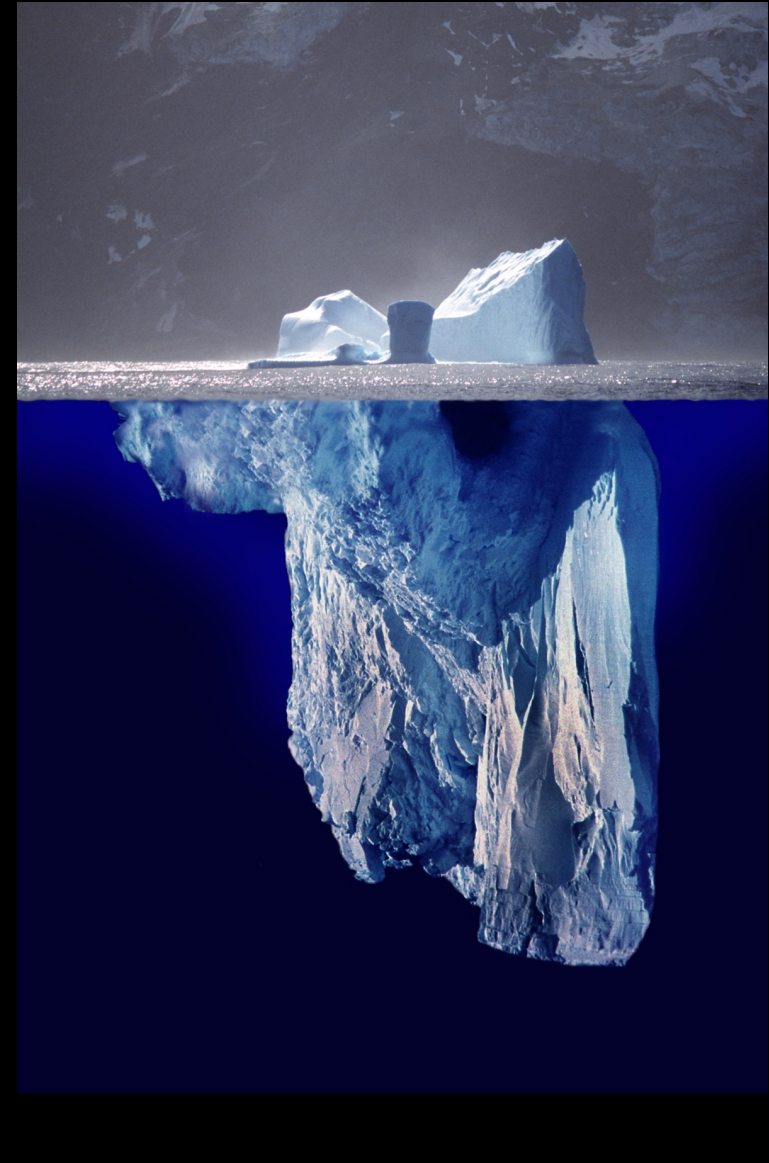
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- The high seas being open to all nations, no State may validly purport to subject any part of them to its sovereignty. Freedom of the high seas . . . comprises, inter alia, both for coastal and non-coastal States:
  - (1) *Freedom of navigation;*
  - (2) *Freedom of fishing;*
  - (3) *Freedom to lay submarine cables and pipelines;*
  - (4) *Freedom to fly over the high seas.*



# Iceberg Harvesting

- Harvesting icebergs that break off Greenland is an emerging industry in Newfoundland and Labrador.
- Six companies are licensed to do it by the province of Newfoundland and Labrador; they pay the province a fee based on volume.
- Berg Water \$37 per bottle on Amazon.





# It is an Island?

The island is called Okinotorishima, or “distant bird island”; a remote, storm-wracked coral atoll in the Philippine Sea, where two small outcrops protrude at high tide.



# Astronomical Approach

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- (1) A planet is a celestial body that (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape, and (c) has cleared the neighborhood around its orbit.
- (2) A "dwarf planet" is a celestial body that (a) is in orbit around the Sun, (b) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape, (c) has not cleared the neighborhood around its orbit, and (d) is not a satellite
- (3) All other objects, except satellites, orbiting the Sun shall be referred to collectively as "Small Solar System Bodies."



# Other Approaches

- Spatial: choose an arbitrary threshold.
- Control: the action of moving it makes it appropriable.
- Functional: if you can land on it, it is a celestial body.
- Scarcity: take into consideration physical abundance and strategic value.
- Space Object: reform the body to become an object with a human-made structure.
- List approach: Committee decides.





**WORKING TO A SOLUTION**



# Province of all Humankind

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- Cultural connotations
- Flexibility for technological evolution
- Does humanity really claim all of space for itself?
- Territorial definitions form the primary meaning of the word “province.”
  - *The provision could mean that it covers wherever the exploration and use of outer space is undertaken by humanity.*
- Identify what is a celestial body in advance?



# Thank You

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