



How do we Develop an Ethical Framework for Lunar Resource Utilisation?

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What are the current ethical principles underpinning international space law?



Very little active consideration of ethical values pre-mission



What values do those principles reflect? (eg safety, sustainability, continuity of operations, benefit sharing, inclusion, environmental protection etc)



Space as a venue for human exploration (exploitation)



Protection of evidence of life vs Protection of the space environment



Value of human (life/ survival/individual/species)




Concept of 'human' vs national values

Outer Space Treaty

- Article I “exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development” and “exploration and use of outer space ...shall be the province of all [hu]mankind”.
- Article II non-appropriation principle.
- Article III activities to be carried out in accordance with international law.
- Article VI imposes the obligation of authorisation and continuing supervision of space activities upon States : “international responsibility for national activities in outer space, including the Moon and other celestial bodies, 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 Outer Space Treaty.

Outer Space Treaty, due regard:

- Article IX of the Outer Space Treaty requires States to “conduct all their activities in outer space, including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States.” States are obliged to undertake their “studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose.”
- See also (non-binding) COSPAR Planetary Protection Policy
- Article IX is more concerned with ‘human benefit rather than human impact’. (Taylor and Newman. 2018)



**What guidelines are needed
to make lunar operations
both ethical (and safe)?**

**Challenges of lunar
operation:
effect of lunar
gravity, vacuum,
solar weather,
terminator,
radiation, plume
interaction on
human and robotic
activity
many unknowns,
including far side
operating
conditions**



It was during this solar eclipse that the astronauts saw most of the impact flashes. PHOTOGRAPH: NASA



But what is the relevance of
Earth-developed concepts
of environmentalism to the
Moon?

What is the relevance of earth-based notions of environmental protections to space?

“If we choose to understand space as an environment - as opposed to a mere phenomenon for us to exploit - we lay the foundations for an ethics of space exploration that is very different from an ethics that treats space exclusively from the point of view of human interests.” (Reiman 2009)

ICJ Advisory Opinion. Obligations of States in respect of Climate Change, 23 July 2025

With respect to causing significant harm to the environment the ICJ stated that with respect to the principle of prevention, as a rule of customary environmental law, “the Court has recognized that “[a] State is . . . obliged to use all the means at its disposal in order to avoid activities which take place in its territory, or in any area under its jurisdiction, causing significant damage to the environment of another State” (*Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, I.C.J. Reports 2010 (I), p. 56, para. 101). [para 132]

- “[t]he existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment” (Nuclear Weapons, Advisory Opinion, 1996)
- The main elements of this duty are (a) environmental harm to be prevented and (b) due diligence as the required standard of conduct.
- Intergenerational equity
- Precautionary principle

UNGA 13 May 2026

Affirmed the importance of the Court's Advisory Opinion to the clarification of existing international law

Calls upon states to prevent significant harm to the environment by acting with due diligence, including all means at their disposal to prevent activities under their control from causing significant harm to the environment and to cooperate with each other in good faith to prevent significant harm to the environment

Respect and ensure the enjoyment of human rights of peoples and individuals under international law.

[How does this all translate to space? Consider 100km up and beyond]

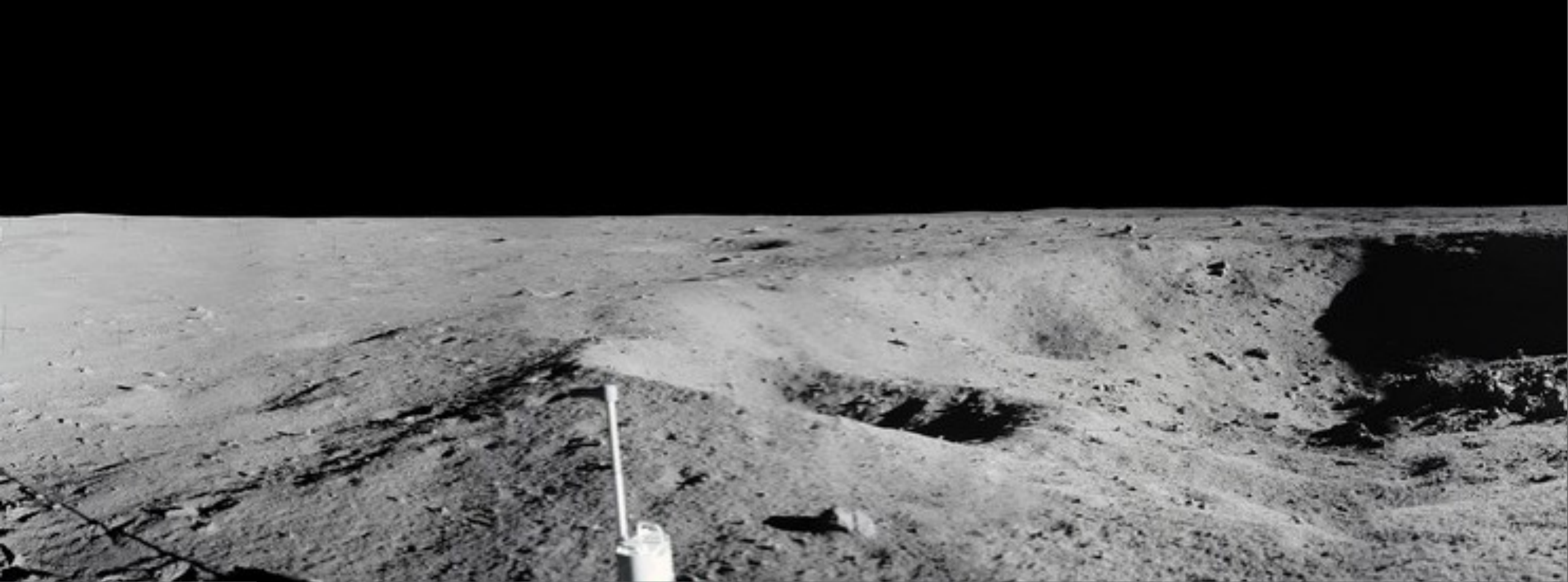
Space as an extension of Earth

- “key issue is whether outer space can be regarded as part of the ‘global environmental commons’ that States must protect” (Takeuchi and Ishii ‘From Climate to Cosmos: The ICJ’s Advisory Opinion and its Implications for Sustainable Space Governance’ (November 17 2025) EJILTalk
- Focus on ‘preserving the functional integrity of a global commons...rather than solely protecting the biosphere.’
- Consider need to protect the environment of space eg space debris, orbits, atmosphere etc but how far does that extend?
- Where humans are active > is that their environment?

The background of the slide features a large, dark, textured sphere representing the Earth, with a smaller, lighter sphere representing the Moon positioned behind it. The top portion of the image is a solid teal color with a fine, diagonal line pattern.

IS 'SPACE' WORTHY OF
PROTECTION IN AND
OF ITSELF OR ONLY AS
A DOMAIN OF HUMAN
ENDEAVOUR?

IS THERE A DIFFERENCE
OF APPROACH FOR
SCIENCE OR
EXPLOITATION?



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Questions?

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