

# Private companies are exploiting outer space, but the law is struggling to catch up

April 3 2024, by Manolis Plionis and Anthi Koskina

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Credit: AI-generated image

On 8 January 2024, NASA launched [Peregrine Mission One](#), which carried capsules to the moon containing human remains and DNA

samples. The goal was to deposit human remains on the lunar surface, and to release the content of the capsules in space.

Some of the only firm [opposition to the mission came from the Native American Navajo Nation](#). According to their culture, such activity is a desecration of the moon. NASA's response was telling: they were unable to check the payloads' contents, as they belonged to a [private company](#).

Private companies depositing [human remains](#) in space is not a new idea: in 1999, an orbiter was deliberately crashed near the lunar south pole, [scattering the ashes of the astronomer Eugene Shoemaker](#). Though it was a NASA craft, the capsule carrying Shoemaker's ashes had been arranged by a private company.

As [more and more private actors venture into space](#), new issues are emerging. International law needs to promptly and carefully regulate all space activity in order to safeguard the future of space exploration.

## **Anthropogenic contamination: the human footprint in space**

Humans have a strong material presence in space, and some believe we are already at the dawn of the ["lunar Anthropocene"](#).

Our species' space footprint can be divided into two broad categories: evidence of human presence in the form of objects or artifacts (including "space junk"), and the release (intentional or unintentional) of biological substances, such as the scattering of human remains in space by private companies like the [Arch Mission Foundation](#). Both categories raise concerns, and present novel, complex challenges for international

law.

[Article IX of the 1967 Outer Space treaty](#), which applies to all space activities, states that countries must consider the interests of other states when conducting space operations. Accordingly, they must also take steps to avoid the [harmful contamination of outer space](#), including the moon and other [celestial bodies](#).

This rule is clear, binding, and covers all countries on the planet. It imposes a broad obligation to protect outer space, but it has needed to be refined over the years. To this end, the Committee on Space Research (COSPAR) has adopted the [Planetary Protection Policy \(PPP\)](#), which is regularly updated. These guidelines are not binding, but the PPP is usually applied by states themselves.

In this context, certain artifacts in space have been given legal protection: in 2020, the U.S. adopted the One Small Step to Protect Human Heritage in Space Act, requiring NASA to take measures to protect traces of the Apollo 11 mission.

## **Space accidents**

The release of [biological substances](#) has already raised serious concerns, not only from the Navajo Nation, but also from the scientific community.

In the 2019 [Beresheet accident](#), a privately funded Israeli spacecraft crashed on the moon during its landing attempt. It allegedly spilled samples of human DNA along with thousands of [tardigrades](#), tiny invertebrate animals able to survive under extreme conditions that are used in experiments to test the limits of survival in outer space.

Critically, the cofounder of the private company that had requested

transport of the payload [acted of his own accord](#), and did not inform any authority of his decision to send tardigrades to the moon.

In this instance, the international laws which exist also to protect the lunar environment from contamination were quite easily evaded, raising serious doubts as to space law's effectiveness.

One might wonder why the moon needs protection from biological contamination, when authorities like the US NASEM Committee on Planetary Protection state that the [lunar surface cannot support life, or the proliferation of organisms brought there](#). While this is true, we still do not fully understand the impacts of human activity on the moon, and it is vital that we preserve and protect it until we have a clearer picture, and until effective mitigation protocols can be established.

For this reason, the [updated COSPAR PPP](#) argues for the need to protect scientifically valuable regions of the moon, especially the [Lunar poles](#), which are of considerable [astrobiological interest](#).

## Gaps in space law

These examples reveal the major shortcomings in the legal protection of the outer space environment. Given the intensifying human presence in space, these need to be promptly addressed, especially in the case of novel privately funded activities [like space tourism](#).

It is imperative that states adopt or tighten national laws ensuring that all operators, public and private, conduct activities in line with [international space law](#). They must also enhance their current legal frameworks to tackle the footprint (and waste) of [new private space activities](#).

Importantly, such laws must also ensure that space operators adhere to [environmental protection](#)—for example by carrying out [environmental](#)

[impact assessments \(EIA\)](#)—to avoid creating additional risks to space activity, as is the case with [space debris](#).

Unilateral decisions to transfer biological material into space or onto other celestial bodies, such as that of the Beresheet accident, cannot be permitted. Such actions could be disastrous, both for the space environment and for human activities. They may also seriously endanger the search for extraterrestrial life.

The COSPAR PPP should be built upon, strengthened and properly enforced on a national level. Only full respect for [international law](#) and international cooperation can pave the way for sustainable development of space activities, and ensure that it benefits all of humanity.

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