



COSPAR updates its Planetary Protection Policy for missions to the Moon's surface

15 July 2021

embargoed until

for immediate release

COSPAR, the Committee on Space Research, and its Panel on Planetary Protection (PPP) have recommended on 18 May 2021 that missions to the Moon would remain under the general terms of COSPAR Planetary Protection Policy Category II, but have **added two sub-categories** for lunar surface missions.

- Category IIa concerns all missions to the surface of the Moon whose nominal mission profile does not access the areas defined in Category IIb below. For those missions, the material inventory recommended by COSPAR will now be limited to those organic products that may be released into the lunar environment by the propulsion system.
- Category IIb concerns all missions to the surface of the Moon whose nominal mission profile accesses the so-called Permanently Shadowed Regions (PSRs) and the lunar poles, in particular latitudes south of 79°S and north of 86°N. For these missions, a full organic inventory, i.e. for solid and volatiles, will still be recommended.

The introduction of these two sub-categories into the PP Policy Category II represent a net relaxation of requirements for missions to almost all of the Moon's surface, as the protected regions near the poles account for less than 1% of the Moon's surface. PSRs, these permanently shadowed spots surrounded by craters on the Moon, have been dubbed "regions of eternal darkness" and can "cold-trap" volatiles.

At the same time, COSPAR's updated policy still protects adequately the scientific interest and future investigations in those lunar polar regions. The organic inventory required for sub-Category IIb includes organic products that may be released into the lunar environment by the propulsion system as well as life support systems, if present; and organic materials carried by the spacecraft that are present in a total mass greater than 1 kg. The concern here is not just direct contamination of impact sites but also the possibility of indirect contamination resulting from release of volatile compounds that could migrate in the lunar atmosphere –or rather "exosphere" as it is called by scientists to account for its very tenuous character – and be trapped in the PSRs.

PRESS RELEASE

The differences between the previous and new categorization for the Moon can be seen when comparing the previous policy and the new one. It is important to note that neither the previous categorization nor the new one prevents any landing on the Moon or access to any region on the Moon. More details about the requirements for documentation in the reporting and the meaning of organic inventory (i.e. list of materials on the spacecraft, including volatiles released by a propulsion or life support system) can be found in the COSPAR Policy on Planetary Protection ([LINK](#)).

Background

In the 1970s, in light of information from the Apollo samples, the Moon had been deemed too dry for biological activity, or even for prebiotic chemistry and therefore missions to the Moon had been assigned to Category I, i.e. not of “...*direct interest for understanding the process of chemical evolution or the origin of life...*” where “...*no protection of such bodies is warranted and no planetary protection requirements are imposed.*” However, with new discoveries arriving since the early 2000s, indicating ice deposits present in the PSRs, which could represent a layered record of solar system history, COSPAR had re-categorized the Moon in 2008 to Category II. This category is for bodies where “there is significant interest relative to the process of chemical evolution and the origin of life, but where there is only a remote chance that contamination carried by a spacecraft could compromise future investigations”.

The PPP took stock of reports published, such as the COSPAR stakeholder consultation, inputs received by the ESA Planetary Protection Working Group, the NASA Lunar Exploration Analysis Group (LEAG), the NASEM’s Committee on Planetary Protection (CoPP) report and more, leading to the decision that a change in the lunar mission categorization and requirements had become pertinent.

The PPP identified the need for sustained lunar exploration efforts in a controlled mode. COSPAR, mindful of protecting the scientific return of solar system exploration, keeps a close eye on future missions to our satellite and it is important to stress that planetary protection policy guidelines are there to ensure that future robotic and human exploration of the Moon will be able to conduct investigations securing scientific results and enabling sustainable human exploration with In Situ Resource Utilization (ISRU).

As always, COSPAR relies on the most recent scientific evidence and consensus in the science community and planetary protection experts to assess the relevant needs and requirements. It regularly updates or consolidates its Planetary Protection Policy to take stock of new discoveries and findings, as was already the case in June 2020.

The COSPAR PPP noted that there is strong need for community input on discussing research reserves, similar to Antarctica. Similarly, the PPP will in the near future review the Policy concerning the planet Mars, currently belonging to Category III (for fly-by and orbiter missions), Category IV (for lander missions), or Category V, restricted Earth return and decide whether or not it potentially requires any updates.

The Chair of PPP, Dr Athena Coustenis, is a planetologist and Research Director at the Paris Observatory, specializing in the study of planets, icy moons and exoplanets. She stated: *“The COSPAR PPP has undergone significant restructuring since 2018 and comprises now both agency representatives and scientists that help with issuing recommendations for updates of the Policy to the COSPAR Bureau as often as required. This helps to conduct a sustainable and safe space exploration and protects our planet. We urge everyone interested to attend our Open Session meetings.”*

Professor Lennard Fisk, President of COSPAR, added that *“COSPAR is engaged in an ongoing effort to update its Planetary Protection Policy, relaxing requirements while ensuring that the exploration and use of planetary bodies is conducted consistent with the latest scientific evidence on planetary protection needs and requirements. The update of the COSPAR Planetary Policy for the Moon will be followed by an update of the Policy for Mars.”*

Issued by: COSPAR Communications Ms Leigh FERGUS
leigh.fergus@cosparhq.cnes.fr

[Link to COSPAR PPP Home Page](#)

Note to Editors:

COSPAR, the Committee on Space Research, was created in 1958, at the dawn of the space age, under the aegis of the International Council of Scientific Unions, now the [International Science Council \(ISC\)](#). COSPAR’s objectives are to promote on an international level scientific research in space, with emphasis on the exchange of results, information and opinions, and to provide a forum, open to all scientists, for the discussion of problems affecting space research.

In its first years of existence as an entity that ignores political considerations and views all questions solely from the scientific standpoint, COSPAR played an important role as an open bridge between East and West for cooperation in space. When this role became less prominent with the end of the Cold War, COSPAR focused its objectives on the progress of all kinds of research carried out with the use of space means.

PRESS RELEASE

COSPAR has played a very central role in the development of new space disciplines such as life sciences or fundamental physics in space, by facilitating the interaction between scientists in emerging space fields and senior space researchers.

COSPAR strives to promote the use of space science for the benefit of mankind and for its adoption by developing countries and new space-faring nations, in particular through a series of Capacity Building Workshops which teach very practical skills enabling researchers to participate in international space research programs.

COSPAR advises, as required, the United Nations and other intergovernmental organizations on space research matters or on the assessment of scientific issues in which space can play a role, for example the Group on Earth Observations (GEO), in which COSPAR is a Participating Organization.

Finally, COSPAR is the key entity world-wide in terms of developing, maintaining and promulgating clearly delineated policies and requirements as to the standards that must be achieved to protect against the harmful effects of biological interchange in the conduct of solar system exploration and use. Such protection against potential contamination, called “Planetary Protection”, encompasses (1) possible effects of contamination of planets other than the Earth, and of planetary satellites within the solar system by terrestrial organisms; and (2) potential contamination of the Earth by materials returned from outer space carrying potential extraterrestrial organisms.

The legal basis for Planetary Protection is established by Article IX of the United Nations Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (UN Outer Space Treaty of 1967).

COSPAR and its Panel on Planetary Protection informs the international community and authorities responsible for compliance with the Outer Space Treaty, e.g. the Committee on the Peaceful Uses of Outer Space (COPUOS) of the United Nations, as well as various other bilateral and multilateral organizations, of policy developments on Planetary Protection.