

RECOMMENDATION FROM THE COSPAR PANEL ON PLANETARY PROTECTION

At its closed session on 4-5 December 2019, the COSPAR Panel on Planetary Protection considered the following topic and made the recommendation below for inclusion in the COSPAR Planetary Protection Policy Implementation Guidelines. The recommendation was validated by the COSPAR Bureau on 9 June 2020 and will be included in the new version of the Implementation Guidelines:

Outer Solar System (PPOSS study follow-up)

The agreement by the Panel at the session in January 2019 was as follows: On the PPOSS first recommendation regarding conditions compatible with replication, the Panel reached the conclusion that the COSPAR Planetary Protection Policy and its associated implementation guidelines should include a generic definition of the environmental conditions potentially allowing Earth organisms to replicate but that a more comprehensive discussion led by Panel Member Peter Doran on this matter with precise wording for the Policy will take place at the next COSPAR PPP meeting.

P. Doran recalled how the last meeting had discussed those matters of planetary protection for outer solar system bodies, and on the basis of that request, he provided a presentation, which addressed the topic. On this basis the Panel agreed to use as a basis for its recommendation the definition of water activity (a_w) as being the relative humidity divided by 100, as presented in “A New Analysis of Mars “Special Regions” Findings of the Second MEPAG Special Regions Science Analysis Group (SR-SAG2)”, Rummel et.al (Astrobiology, Vol 14, No 11, 2014).

The COSPAR Planetary Protection Panel recommends that the implementation guidelines to the COSPAR Planetary Protection Policy should include a generic definition of the environmental conditions potentially allowing Earth organisms to replicate. This definition should read as follows and be included in the Planetary Protection Policy implementation guidelines:

PPP RECOMMENDATION

Environmental Conditions for Replication

Given current understanding, the physical environmental parameters in terms of water activity and temperature thresholds that must be satisfied at the same time to allow the replication of terrestrial microorganisms are:

Lower limit for water activity: 0.5

Lower limit for temperature: -28C
