

# Abstracts

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## **Understanding Extreme Habitability with ESA Missions**

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### **ESLAB 51 rationale**

The 51st ESLAB Symposium: “Extreme Habitable Worlds”, at ESTEC 04-08 December 2017 [1] covers contributions on a variety of interdisciplinary themes regarding extreme habitability on Earth, in orbit, at Moon, Mars, in the solar system and throughout the universe. The symposium programme includes keynote talks, invited talks, oral and Flash contributions, poster presentations, interactive demo presentations and performances, debates, social habitability and artistic events [2]. ESLAB51 audience ranges from scientists, engineers, experts from various disciplines and age. 15 Young Researcher Awards have been funded by the ESLAB 51 Symposium, COSPAR & ILEWG.

As introduction to the various specific ESLAB51 sessions, we shall discuss how space missions, in particular from ESA (across all ESA programmes: Science, Earth, Exploration, Human Spaceflight, Technology & Application) address the overall ESLAB51 themes of Extreme Habitability .

### **ESLAB 51 Themes & Understanding Extreme Habitability with ESA Missions**

1. Venus, Earth, and Mars —the first 500 million years
2. Planetary habitability processes: accretion, evolution, impacts, ingredients
3. Evolution of habitability and settings for origins of life at Earth
4. Earth extreme habitats: natural (surface and subsurface), artificial and sustainable
5. Life support systems in Earth extreme places and in orbit, human spaceflight
6. Making the Moon and Mars habitable
7. Mars past, current , and future habitability
8. Asteroid and small body habitats
9. Outer solar system: Sub-surface Habitability at icy moons of Jupiter and Saturn
10. Effects of space weather and Astrophysical hazards
11. Planetary protection and measuring extreme biomarkers
12. Stellar, interstellar and interplanetary ingredients for extreme habitability
13. Engineering of travel to and exploration of Extreme Habitable Worlds
14. Finding and Characterising Habitable Exoplanets: Proxima Centauri, Trappist1 and beyond
15. Galactic and Extragalactic Habitability
16. Education, outreach, societal, philosophical & artistic views on "Extreme Habitable Worlds"



We thank the Science and Local Organising Committees [3], organisers, participants, speakers and posters authors, sponsors (ESA, ESTEC, ESA Science Support Office, COSPAR, ILEWG) and supporters of ESLAB51.

### References

[1] <http://old.esaconferencebureau.com/2017-events/eslab2017/introduction>

[2] <http://old.esaconferencebureau.com/2017-events/eslab2017/preliminary-programme>

[3] <http://old.esaconferencebureau.com/2017-events/eslab2017/committees>