

Life Sciences as Related to Space (F)  
Astrobiology and Exploration (F3.2)  
Consider for oral presentation.

## **BIOSIGN: A SPACE EXPERIMENT ON THE ISS AS PREPARATION FOR IN SITU LIFE DETECTION MISSIONS AND HABITABILITY STUDIES**

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BioSigN

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BioSigN (**BioSignatures** and habitable **Niches**) is a space experiment supported by ESA and foreseen to be performed in Low Earth Orbit. The main objective of BioSigN is to support and prepare future planetary exploration missions to Mars, Enceladus, Europa and/or Titan by conducting exposure experiments on the ISS. To maximize the scientific output, the outcome of BioSigN will be connected to the results obtained on ground from recent and up-coming planetary analogue field site studies and planetary simulation facilities. The BioSigN project is conceived to achieve three central objectives:

- To analyse to what extent selected organisms and (micro-)fossils acquired from planetary/Mars-analogue field sites can survive/outlast the conditions of space exposure;
- To evaluate by the obtained results the habitability of present/past Mars and of the icy ocean worlds in the solar system.
- To test the (in)stability of a particular set of bio-molecules when exposed to space and Mars-like conditions, and to investigate their mechanisms of resistance or degradation as well as analysing if they are still detectable by the commonly used life detection methods;

To reach these goals, the test samples will be exposed to space vacuum and space radiation, approaching icy-moon specific or planet-specific gaseous and solar environments.