

Human Mars Mission Contamination Tracking

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Searching for evidence of extant or extinct life on Mars, exploring its geological history and ultimately establishing a permanent human presence are considered major drivers for human-robotic missions as proposed in the Global Exploration Strategy [1] of 14 space agencies recently. However, reducing the potential forward and backward contamination -likely to happen for both robotic and human explorers- remains a key challenge for mission designers.

The Austrian Space Forum has been leading an initiative to simulate human-robotic surface excursions on Mars by developing high-fidelity spacesuit simulators [2] and deploying them in Mars-analog regions on Earth since 2006. One of the research highlights has been the development of a simple technique using fluorescent microspheres which are mimicking various surface properties of biological particles [3].

We present insights into the challenges of both dust control and biological barriers during those simulations, such as during the AustroMars mission in Utah (2006 [4], Fig. 1), the Dachstein Ice Cave mission (2011 [5]) and the MARS2013 mission (Northern Sahara, 2013 [5,6]).



Fig.1: Mylar-foil shielded spacesuit simulators for tracking the contamination vectors during the AustroMars mission.

References:

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