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Title

Asclepios Mission III: THIRD ITERATION OF THE STUDENT-LED ANALOG MISSION SIMULATING A HUMAN EXPEDITION TO THE LUNAR SOUTH POLE

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Asclepios Team

Abstract

The Asclepios project is a community-based analogue space mission program led by an international team of students and supervised by the eSpace Center. Asclepios provides a platform for simulating space missions, training aspiring astronauts, and acts as a testbed for human-spaceflight research. The main focus of Asclepios III, the third mission, is space medicine and more specifically identifying and evaluating medical risks in the lunar environment, space nutrition, life support systems, sleep quality, human behavior in isolation, space physiology and overall physical and mental health of the astronauts. More research fields will also be explored such as environmental sciences and sustainability of lunar operations, engineering and astrophysics. Asclepios III, will take place in July of 2023 where six analogue astronauts will be isolated in an analogue lunar habitat in the Sasso San Gottardo Fortress (Switzerland) for 14 days. Throughout the simulation, the astronauts' primary objective is to conduct experiments investigating how the simulated isolated environment is affecting space medicine in all the ways defined above, in order to prepare for future colonization of the Moon. All aspects of the simulation will be monitored by a Mission Control Center in constant communication with the crew. This ensures correct data collection, rapid resolution of problems, and effective time management.

This report will be highlighting the key importance of each of the five main teams of the organization for the successful outcome of the mission and how lessons learned from this and previous Asclepios missions can be implemented from the beginning for the improvement of Asclepios IV. The five main teams of the organization - Management, Science, Design, Communication, and Analogue Astronaut - are split into smaller sections for effective and productive preparation for the mission.

Previous Asclepios missions have shown the ability of students to plan and execute successful analogue space missions, providing a low-cost, low-risk opportunity for scientists and engineers to experiment and validate procedures. The mission will contribute to preparing for future lunar colonization.