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Author: Mr. Leszek Orzechowski
Space is More, Poland

Ms. Agata Mintus
Space is More, Poland

Dr. Agnieszka Skorupa
University of Silesia in Katowice, Poland

Dr. Mateusz Paliga
University of Silesia in Katowice, Poland

FROM ANALOG RESEARCH TO SPACE - LUNARES RESEARCH STATION AS AN EXAMPLE OF
A GROUND-BASED SEGMENT FACILITY FOR ANALOG DATA GATHERING,
PROCEDURES/TECHNOLOGY TESTING AND OPTIMISATION.

Abstract

This paper explores LunAres' role in facilitating the preparation and realisation of experiments destined for the International Space Station (ISS) in 2024. Several experiment proposals submitted in collaboration with research institutions were selected by ESA, the Polish Ministry of Economic Development and Technology, and POLSA for a flight on board in which the Polish astronaut (ESA reserved astronaut) will be participating. The roadmap leading to the acknowledgement of LunAres as a relevant analog base in spaceflight preparation will be presented.

As a test platform and analog data-gathering environment, LunAres offers great space for refining procedures and conducting research before space missions. The possibility of data collection over many years has paved the way for testing and optimising procedures. LunAres can serve as a ground-based segment of immense importance for testing studies and procedures. Additionally, the paper delves into the significance of collecting data within LunAres, utilising past and future mission data as baselines for comparison or as statistical data.

As part of the data gathering for studies selected for the ISS flight, LunAres planned the first analog mirrored mission to the one conducted in space. The conditions and mission architecture will be adjusted to be as accurate as possible and similar to the ones on the ISS. The preparation and mission plan will be presented in this paper. It is important for analog research to establish basic requirements and conditions for analog facilities organising crewed mission simulations.

The goal of LunAres being part of the ISS experiments is to acquire experiential knowledge and substantiate the importance of analog research. The paper outlines the timeline for LunAres' involvement in experiment preparation, highlighting the process of refining procedures and conducting research.