

The Poland Mars Analogue Simulation 2017 – operating an international volunteer-based Moon-Mars isolation mission

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In 2017, the Space Exploration Project Group (SEPG) of the Space Generation Advisory Council (SGAC) conducted the Poland Mars Analogue Simulation (PMAS 2017). Going in line with current plans to return to the Moon as a testing ground for human operations before sending humans to Mars, PMAS 2017 was a two weeks long analogue simulation of a Lunar and Martian exploration scenario. It aimed to study the performance of astronauts conducting geological fieldwork, the application of technologies to support human activities on a planetary surface and to perform controlled investigations in psychology and human factor studies. During their 14-day inclusion in the LunAres habitat in Pila, Poland, – operated by the Space Garden Company – a crew of 6 selected analogue astronauts conducted a variety of experiments, such as geological sampling, the application of in-situ 3D-printed tools, operating the Exploration and Sampling Companion Rover from UNAM Space, performing tests with the ESA ExoGeoLab Lander, conducting measurements of Radon emissions, and performing of several psychological assessments.

They were monitored and supported by 35 team members in mission support in Torun, Poland, performing additional studies on mission operations; communications were – except for the morning briefings – kept completely via text chat. During the Lunar simulation, incoming messages were analysed and answered in real-time, while after switching to the Martian mode, a 15-minute time delay increased the difficulty in communications and operations, as well as the isolation feeling for the analogue astronaut crew.

The entire PMAS team, which extended to over 80 SEPG members (counting the remote supporters), consisted of students and young professionals from various backgrounds such as engineering, physics, geology, medicine, psychology, and even arts, and from over 30 nations, all which were volunteering for this unique project.

Here, we present the challenges we had to face operating PMAS 2017 during its Lunar phase and after the switch into the Martian mode, and some first results of the performed scientific experiments.

Acknowledgement: Besides all of our team members and externals supporting us, we would like to thank our partners at ABM Space Poland and the International Lunar Exploration Working Group (ILEWG), all of our sponsors, as well as the Space Garden Company for providing the LunAres facility for the PMAS 2017 project.