

EuroMoonMars workshop and simulation at ESTEC

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1. Introduction

The 20th and 21st of July, ESTEC held a EuroMoonMars workshop to gather actors from various backgrounds around the topic of the MoonVillage. The workshop was split into four main activities: Talks related to the MoonVillage, demonstration of existing equipment, brainstorming on specific issues linked to the MoonVillage and a Moon base simulation.

2. Description of EuroMoonMars

The 2017 EuroMoonMars analog habitat was intended to provide a knowledge about what is the minimum and necessary equipment needed when arriving on the Moon using off the shelf and cheap components and where the focus should be put on. Even though the purpose is neither to test new equipment and technologies nor to perform some human and psychological experiments, high technologies experiments are developed and tested to increase the coherence of the data collected [1]. It is composed of three main elements, ExoHab, ExoLab and ExoGeoLab.

ExoHab is designed to assure the primary functions of a geological laboratory, as well as a communication centre and a place for the astronauts to rest [2]. It represents the “first house” of the MoonVillage. As such, it is used to centralize every aspect of the mission (communication, science, life).

ExoLab is a modular laboratory based on standard space container. Thus, the whole layout has been thought to be dismountable and reusable in similar containers. For this purpose, highly modular magnetic walls capable of supporting heavy charges have been developed using off-the-shelf components as well as modular furniture.

ExoGeoLab is a lander developed at ESTEC with the collaboration of ILEWG [3]. It is equipped with multiple equipment such as a spectrometer and a telescope. It is possible to remote control all the instruments of the lander to be able to operate from ExoHab, ExoLab or any control centre. Additional experiments can be implemented on ExoGeoLab thanks to its modularity. Recently, plant growth on lunar soil experiments have been added.

3. Goals of EuroMoonMars

International Tasks Groups such as ILEWG, IMEWG, ISECG, space agencies, and research partners can use the results of the research performed in the frame of EuroMoonMars for the benefits of Science, Exploration and Application programs. It also serves to raise awareness through public demonstrations.

4. EuroMoonMars Workshop

The EuroMoonMars workshop is a unique opportunity to gather space actors with totally different backgrounds (from Arts to Engineering, Sciences, Business and Economics).

The first part of the workshop enables each participant to talk about his/her work. Results from other MoonVillage workshops are presented as well as individual and agency/companies projects.

The second part of the workshop gives an opportunity to demonstrate new systems or technologies. Communication devices were shown as well as different rovers or the ExoGeoLab capabilities.

The third part of the workshop split the participant into three groups to brainstorm about three topics:

- The habitat on the Moon and the analog missions
- The technologies
- The outreach and funding

The fourth part of the workshop was a simulation of the first day on the Moon in ExoHab and ExoLab. The participants were given protocols and schedules with specific tasks to perform. They were split in different groups (ExoHab, ExoLab, Moon Orbiter, Mission Control). The simulation gives precious information for future iterations and enables extend the outreach by giving a realistic overview of a Moon habitat.

5. Conclusion

EuroMoonMars workshop gathers actors in the space industry, as well as space enthusiasts, artists and others, and brings, through all these meetings and knowledge sharing, new opportunities and collaboration to progress further on the way to the MoonVillage.

6. References

- [1] Evellin P. et al (2017) LEAG 2017 – 5075
- [2] Blanc A. et al (2017) LEAG 2017 – 5072
- [3] Lillo A. et al (2017) LEAG 2017

Short Summary

EuroMoonMars workshop gathers engineers, artists, scientists, economists, businessmen and, more generally, space enthusiasts to elaborate the future of Moon exploration through talks, demonstrations, brainstormings and actual simulations.