

29th IAA SYMPOSIUM ON SPACE AND SOCIETY (E5)  
Space Architecture: Habitats, Habitability, and Bases (1)

Author: Mr. Manfred Thallner  
Vienna University of Technology, Austria

Dr. Aidan Cowley  
ESA, Germany

Dr. Sandra Haeuplik-Meusburger  
Vienna University of Technology, Austria

FLEXHAB WORKING MODULE - ARCHITECTURAL REQUIREMENTS AND PROTOTYPING  
FOR A LUNAR BASE ANALOGUE

**Abstract**

Analogues and simulations play an important role in preparation for space exploration. They allow us to test experiments before sending them into space, develop countermeasures for the special conditions or study human behaviour in similar environments. The so called FLEXhab, Future Lunar Exploration Habitat, will serve as a lunar base analogue in order to create a training and experimental environment at the European Astronaut Center, EAC.

The design of a potential lunar base is very much affected by the specific environmental conditions. Therefore those will be analysed to implement the effects into the analogue, with the goal to create a similar interior as well as to test countermeasures for specific challenges.

Also an overview is given on the potential tasks carried out inside a lunar base, and further the analogue, as they influence the habitat design as well.

This paper presents a design for the interior of the FLEXhab working module, based on a previous developed concept. (O. Punch, T. Dijkshoorn, 2016)

Further, the so called FLEXrack will be presented, a recently developed movable rack system. The concept will increase flexibility for exploration module design and increase the available space for tasks and experiments inside the module. To give a first impression of the design and the FLEXrack concept operationally, a prototype is built and evaluated at the EAC. Finally, design requirements for the final design of FLEXhab, the integration of FLEXrack within FLEXhab, as well as for analogues in general are presented.