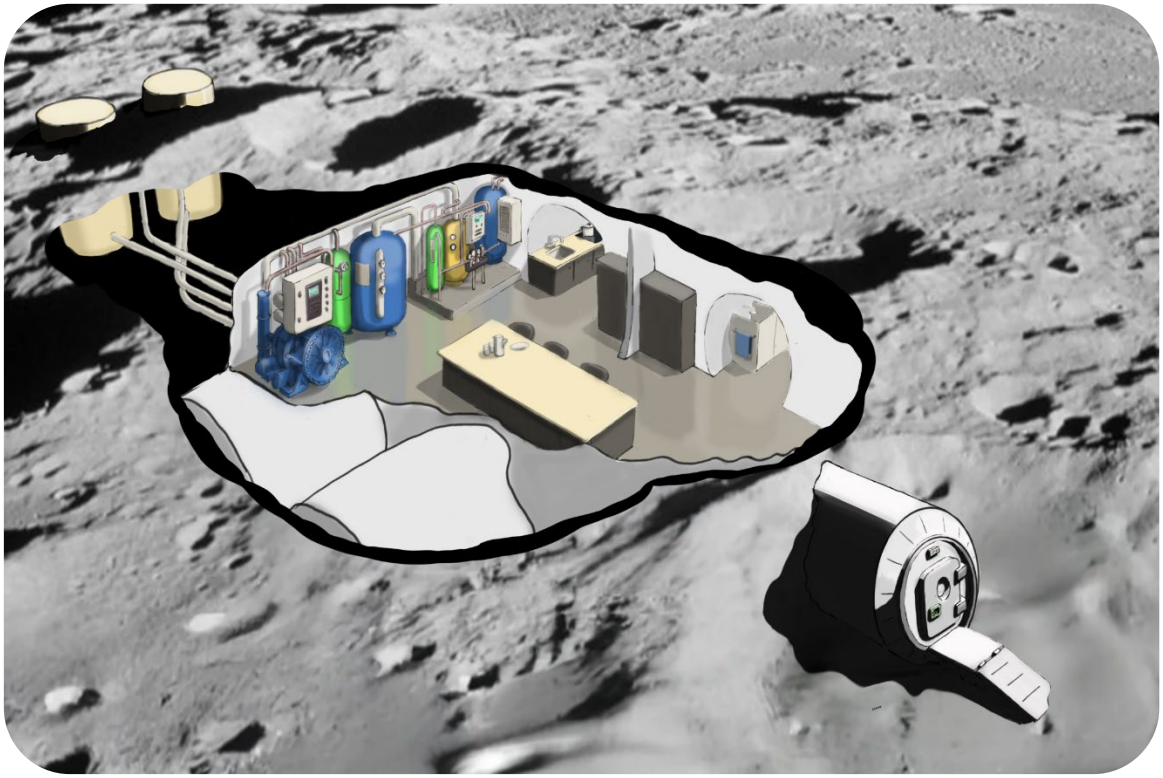

Water Storage System for Lunar Life Support and Exploration

Executive summary

Early Technology Development

Open Discovery Ideas Channels, EISI IDEA: I-2021-03398

Affiliation(s): Sirin Orbital Systems AG (Prime, CH), Zurich University of Applied Sciences ZHAW (Sub 1, CH)

Activity summary:
A system is researched and developed to store water in its liquid state at temperatures below the freezing point using a passive unfreezing method. This is achieved by mixing it with phytantriol, a commercially available non-toxic, non-volatile, non-corrosive, non-inflammable lipid. Both, the scale up of the enrichment process from laboratory scales, and the separation of water from phytantriol, are demonstrated experimentally. In addition, various material properties are measured, an architecture is proposed, and a numerical model is developed to obtain first estimates of the power consumption of a system of this type.

Publishing Date: 01-03-2023
Contract Number: 4000136427
Implemented as ESA Initial Support for Innovation