

25th IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR SYSTEM (A5)
Interactive Presentations - 25th IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR
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LUNAR OASIS – ARCHITECTURAL VISIONS FOR AN INTEGRATED LUNAR HABITAT

Abstract

During the Fall semester 21/22, a cross-national and collaborative design studio has been held between the TU Wien and Abu Dhabi University. Students from the course Sustainable Design at ADU, and the space architecture design studio class of TU Wien have been coordinated in mixed groups for a project named “Lunar Oasis – Architectural Visions for an Integrated Habitat”. Within this coordinated design studio students explored opportunities, limits, and constraints related to the design, construction, operation and implementation of integrated life-support and greenhouse technologies for a habitat in an isolated and extreme environment. The goal was to explore possible solutions that are based on an intercultural and cross-disciplinary design process and transform them into an innovative architectural project. Within the joint studio, mixed teams of bachelor and master students from 24 different countries developed innovative research facilities with a particular focus on an integrated technical system. Additional input on greenhouse technology, mission planning, transportation and habitation design, as well as habitability and space psychology were provided by an extended team of experts from space architecture and engineering, space companies as well as ESA. The final presentation took place at the World Expo in Dubai. Eventually all space architecture projects present the multi-cultural and cooperative perspective that is needed for the design integration. This paper presents the outcome of the design studio. It starts with summarizing the programmatic idea and educational strategy of the design workshop. The main part of the paper discusses the different typologies that have been developed for the various concept of near-time future lunar research facilities. Eventually common themes that concern the actual development of a future international and cross-cultural research platform with integrated LSS technology on the Moon are summarized.

Keywords: Greenhouse Integration, Circular Economy, Moon Village, Space Architecture, Design Workshop, New Themes, In-Situ built lunar base, Resilience