

21st SYMPOSIUM ON SPACE ACTIVITY AND SOCIETY (E5)

Future and current space missions: including and expanding all aspects of human life on-board and in other worlds (1)

Author: Dr. Sandra Haeuplik-Meusburger
Vienna University of Technology, Austria, haeuplik@hb2.tuwien.ac.at

DESIGN-IN-USE STUDY OF EXTRA-TERRESTRIAL HABITATS FROM THE PERSPECTIVE OF
HUMAN ACTIVITIES

Abstract

Habitability and human factors are important determinants for the design of any inhabited structure or human-used object, especially in a confined and isolated environment. Beyond Earth only the habitat secures the basic requirements of humans' existence. Therefore this kind of habitat is especially subject to careful planning, designing and building. Habitability is an important design issue. But what makes a confined and isolated habitat in an extreme and hostile environment a comfortable place to live work for people coming from a diverse society?

Today we look back at a series of realized space habitats – as well as the presently orbiting International Space Station. These highly technological habitats have been providing living working space in a hostile and socially isolated environment for varied users over long periods of time.

This paper presents the results of a recently completed study about the interface between people, space and objects in an unearthly surrounding.

Selected case studies were: Apollo Spacecraft Lunar Module, Salyut Space Station, Skylab Space Station, Space Shuttle Orbiter, Mir Space Station and the International Space Station. These case studies were evaluated and summarized according to the human activities: Sleep, Hygiene, Food and Work in relation to the characteristics of the built environment. Information was gathered from technical reports, published books, reviews and lessons learned as well as from personal interviews with astronauts.

The paper will introduce the selection criteria and methodology of the conducted design-in-use-study. Relevant issues that have been found to be of significant influence on the habitability system will be highlighted. The study results were further formulated as design directions for each human activity category.