

SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FAR FUTURE (D4)  
Contribution of Space Activities to Solving Global Societal Challenges (4)

Author: Dr. Irene Lia Schlacht

Politecnico di Milano / Technische Universität Berlin, Italy, irene.schlacht@mail.polimi.it

Ms. Ayako Ono

Tohoku University Graduate School of Medicine, Japan, a.ono@med.tohoku.ac.jp

Mrs. Valentina Karga

Berlin University of the Arts, Germany, valkarga@gmail.com

Mr. Alexandre Mangeot

University of Orléans, France, alexandre.mangeot@imelavi.fr

Prof. Melchiorre Masali

Università degli Studi di Torino, Italy, Melchiorre.Masali@gmail.com

Prof. Bernard Foing

European Space Agency (ESA/ESTEC), The Netherlands, Bernard.Foing@esa.int

Prof.Dr. Matthias Roetting

Technische Universität Berlin, Germany, Roetting@mms.tu-berlin.de

EXTREME LIVING SOLUTIONS: SELF-SUFFICIENT HABITAT FOR EXTREME ENVIRONMENTS  
BASED ON SPACE TECHNOLOGY

**Abstract**

This paper presents the first research on a system based on space technology that is capable of increasing habitability in extreme earth environments. In this scenario, this research aims to support the establishment of an autonomous and minimum habitat from consulting to construction based on minimum space, time and costs. Extreme environments are places for which human beings are not fully suitable, such as an environment where the water is contaminated because of a natural disaster. To support habitability in such conditions this paper approaches the research on autonomous habitats based on space technology, such as the water recycling system used today on the International Space Station. But what happens in such isolated habitats from a psychological side? In an extreme situation, the habitability project needs to be approached from a multidisciplinary dimension, considering all the different aspects as part of holistic (Holos: all) research. Indeed, space research can again be applied both to technology transfer and to research transfer, including, for example, psychological research. This paper would start by providing consultancy services for users who want to improve extreme habitability projects and later on develop towards building minimum habitats for extreme environments, to be used in isolated conditions, disaster situations or even in urban settings. The investigation (capturing space dimensions, volumes, people, traffic, and interaction flow) will serve users in terms of the quantitative assessment of habitability and ergonomics for habitats in extreme or stressed environments. The research will be validated using data from the Mars Desert Research Station and other cases.