2013-2016

SELF-DEPLOYABLE HABITAT FOR EXTREME ENVIRONMENTS

PROJECT MISSION:

The SHEE mission is to develop a deployable autonomous architecture and technology test-bed for simulating terrestrial analogues of extreme environments such as those found Moon and Mars and apply the project findings to terrestrial extreme environments and disaster zones.

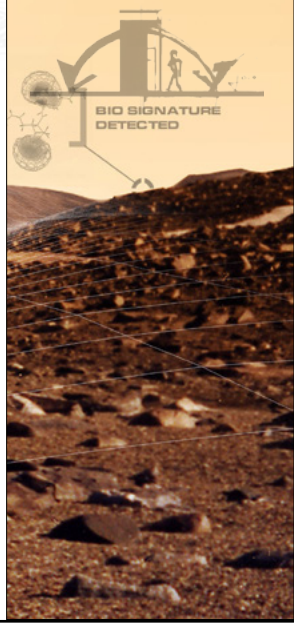
PROJECT DESCRIPTION:

Self-deployable autonomous habitats are needed, in particular, in extreme environments where there is no infrastructure and heavy machinery available. Such habitats will mitigate construction safety risks and reduce costs because of their subsystems coupling and compact transportation size.

However, the integration of robotics into architecture is currently at a very low level of technology readiness. SHEE will address significant gaps in this area to progress the research of extra-terrestrial habitats, leading towards feasible solutions for near-term human space exploration. The understanding of self-deploying and fully self-sustainable habitats for space will also provide a knowledge base for terrestrial applications. The potential of SHEE-related products for terrestrial applications lies in the support and protection of humans exposed to natural disasters. The utilisation of rapidly self-deployable habitats that do not require any infrastructure for their operation may become an essential part of a post-disaster management.

The SHEE habitat test-bed will be composed of a deployable (flexible) structure of approximately 5 m in diameter surrounding a 1.5 - 2.5m diameter rigid core structure. The habitat will be up to 4m tall including robotic deployment of subsystems and an external power generation system. The habitat test-bed will be conceived as a temporary living module for two people. The folding capability of the habitat will allow interdisciplinary research and tests of various technologies in different locations in Europe and worldwide.

STARTING DATE:
01/01/2013
DURATION:
36 MONTHS
EU CONTRIBUTION:
EUR 1.9 MILLION
TOTAL COST:
EUR 2.3 MILLION



Why is this project important for Europe and how does it benefit European citizens?

Self-deployable and self-sustainable emergency habitats may significantly help during and after natural disaster scenarios.

The SHEE compact architecture will indicate how aspects of subsystems providing self-sustainability and autonomy providing subsystems may be leveraged in future buildings in daily life.

SHEE will significantly contribute to human spaceflight research in Europe and worldwide by providing an innovative habitat analogue test-bed.

CONSORTIUM:

- INTERNATIONAL SPACE UNIVERSITY
- LIQUIFER SYSTEMS GROUP GMBH
- SPACE APPLICATIONS SERVICES N.V.
- INSTITUTE OF TECHNOLOGY, UNIVERSITY OF TARTU
- COMPAGNIE MARITIME D EXPERTISES S.A.
- SOBRIETY S.R.O.
- SPACE INNOVATIONS, V.O.S.

Credit: sketches and graphics

SEVENTH FRAMEWORK PROGRAMME