

IAF SPACE EXPLORATION SYMPOSIUM (A3)
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MOONMARS EVA TEAM WALK SPACE SUITS: OPEN PLATFORM FOR MODULAR SPACE SUIT
DESIGN

Abstract

TWSS (Team Walk Space Suit) is an educational program and an open platform for modular space suit design, which brings together international and multidisciplinary team of students from various universities and young professionals with different backgrounds and skillset to develop a new generation of experimental and functional MoonMars EVA suits. The program started as an interfaculty course at the Royal Academy of Art in collaboration with ILEWG.

Within the framework of the project, participants are invited to develop instruments and designs for one of the essential elements of a space habitat – a spacesuit. Astronauts must wear it whenever they leave a spacecraft and are exposed to the space environment. Its main function is keeping human alive in the harsh environment of outer space, vacuum and temperature extremes. Besides that, space suit should facilitate comfortable temperature, pressure and atmosphere, but not limit agility and dexterity of the suit wearers, so that they can carry out various physical technical tasks. Thinking of the permanent presence of human in space, we can imagine that importance of a spacesuit will only grow as well as the need to widen it's functionality.

Team Walk Space Suit should remain functions of the space suit focusing on smart technology integration and human factor analysis. Space suit as astronaut's second skin that lets him/her experience sense of touch, perceive environment, involve in social interactions. Spacesuit as a custom and adaptive interface device with the environment or equipment contributing to astronaut well-being, mission success and sustainable exploration.

Spacesuit can assist CRM (crew resource management) by enhancing specific senses and skills to guide behavioural activities associated with teamwork. Certain senses can be dynamically altered for a specific task or role, e.g. visible spectrum from human to honey bee like robot vision allowing to see UV light patterns and use polarised light as a navigating system.

TWSS platform encourages and enables industry collaborations to explore the production possibilities and ways to implement high tech materials and to foster a rapid transition from academic research to commercial applications. The presentation at IAC will cover overall TWSS concept, projects and modules developed by TWSS working groups, results from field campaigns, and the next steps including terrestrial applications.

We will report on data obtained, results from space suits tests and experiments conducted at Asclepios, ESTEC, HI-SEAS EMMIHS-III mission and EuroMoonMars Iceland campaign.