

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Biology in Space (8)

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A SUMMARY AND KEY OUTCOMES FROM THE BIO-FUTURES FOR TRANSPLANETARY
HABITATS FIRST ANNUAL SYMPOSIUM**Abstract**

Bio-Futures for Transplanetary Habitats (BFfTH) is a research group within the Hub for Biotechnology in the Built Environment that aims to explore and enable interdisciplinary research on transplanetary habitats and habitats within extreme environments through an emphasis on the bio-social and biotechnological relations.

BFfTH organized the online and onsite networking symposium Bio-Futures for Transplanetary Habitats in order to examine how emerging biotechnologies, living materials and more-than-human life can be implemented in habitat design and mission planning. The aim of the two days symposium is to serve as a catalyst in establishing an international network of collaborators across industry, academia and the private

sector. It also aims to support the development of novel methodologies to move beyond discipline-specific approaches in order to address and interrogate emerging questions surrounding potential transplanetary habitats and habitats in extreme environments. The symposium is divided into five sessions hosting each at least three speakers, these sessions are: Mycelium for Mars, Plants and Agriculture, Sustainable Habitats and Travels, Artistic Approach to Extremes Habitats, and Novel Biotechnologies for Space Habitats.

This paper presents key outcomes from the symposium sessions, moderated panel, and informal discussions. The trends in ongoing research are identified and summarized following the use of biotechnology and bio-design to ensure and support safety, sustainability, habitability, reliability, crew efficiency, productivity and comfort in extreme environments off and on Earth. Moving beyond pure design and engineering innovation, the outcomes of this symposium also further interrogate sociotechnical imaginaries of biodesigned and biotechnologically-enabled transplanetary futures. The symposium hosts a wide range of topics including: innovative material-driven processes for the design of transplanetary habitats; socio-political concerns or ethical implications to be taken into account; technology transfer and transitioning towards a sustainable built environment on-Earth; multi-species narratives and relations to sustain human and other-than-human life in transplanetary habitats; sociotechnical considerations in propagating and sustaining Earthbound life beyond Earth environments; sustainable living on Earth through a holistic systems thinking approach.

BFFTH further reflects on what potential bio-social and biotechnological research is needed to sustain life off-Earth in the future and how it can help transitioning towards a sustainable built environment on-Earth in the present.