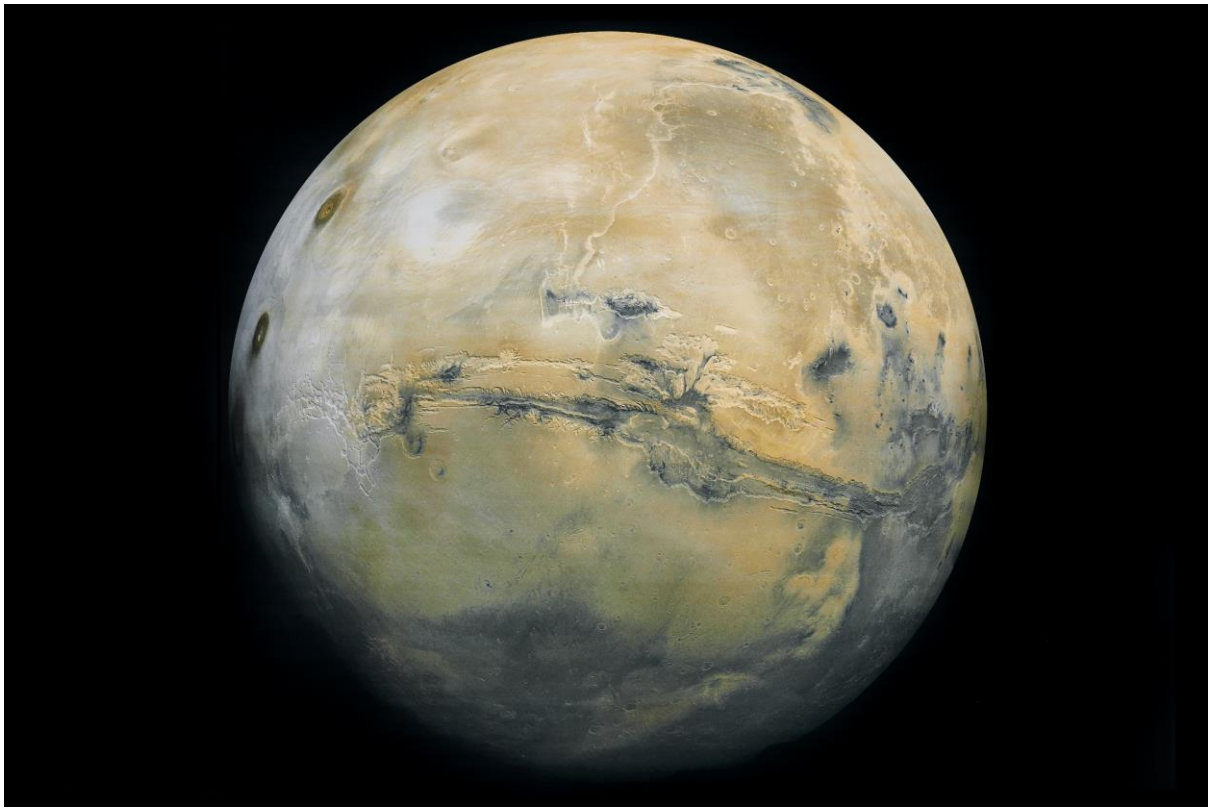
Mars: Designing for the Red Planet

Friday 7th February (14:00 – 18:00)
Bakala Auditorium, Lower Ground Floor
Design Museum, London

#movingtomars



How can human-centred design enable us to adapt to the extreme environments of space? What can desert landscapes teach us about the dangers of extraction and colonisation of a new planet? Can designing for Mars offer us new tools to tackle the environmental challenges we face here on Earth?

Whilst humanity has been gazing at Mars for centuries, only now is human habitation of the planet becoming a near future possibility. But with an average temperature of -63˚C, low gravity that degrades bone, extreme radiation and the absence of oxygen, Mars presents un-precedented challenges for designers and scientists seeking to create a new human habitat. Creating zero waste-streams, closed-loop survival systems, and social spaces in extreme conditions are just a few of the ways in which every aspect of life on Mars will need to be re-imagined and re-designed.

In this half-day symposium, leading designers, scientists, engineers, and innovators will explore the role human and planet-centred design are playing in the greatest 21st century space challenge. Throughout the day there will be a series of lectures and screenings, alongside pop-up displays and workshops throughout the museum.

Mars: Designing for the Red Planet is organised by the Design Museum and Imperial College London.

the DESIGN MUSEUM

Imperial College London

Auditorium

14:00 – 18:00

13:45 Registration open

14:00 Welcome and Introduction from **Dr. Stephen Green,** Imperial College London, and **Justin McGuirk,** the Design Museum.

14:15 – 15:15 **SESSION ONE: The Body on Mars**

How can design enable a human body to survive and thrive in the extreme environments of space? This panel considers the physical and psychological challenges Mars presents, and the role human-centred design can play in augmenting human bodies.

- **Dr Jonathan Eastwood**, Director, Imperial Space Lab.
- **Anna Talvi,** Designer-Researcher.
- Screening of 'Institute of Isolation' by **Lucy McRae.**

Chaired by **Eleanor Watson,** Curator, the Design Museum.

15:15 – 16:15 **SESSION 2: Martian Landscapes**

What can we learn from the desolate landscapes of Earth and Mars, and how might they re-frame our relationship to both planets? This panel examines the parallel landscapes of the Atacoma Desert in Chile and the Martian surface to consider research methods, materials, and the politics of extraction.

- **Mále Uribe Forés,** Architect and Designer in Residence 2019, the Design Museum.
- **Prof.Tom Pike,** Professor of Micro-Engineering, Imperial College London.

Chaired by **Dr. Stephen Green**, Imperial College London.

16:15 Screening of 'Mangala For All' by **Superflux.**

16:30 Break

17:00 – 17:45 **SESSION 3: Other Worlds**

From space architecture to terraforming, what role might design play in the construction of new worlds on Mars? This panel explores the architecture of closed worlds, systems-thinking in design, and the ethics of human intervention on Mars.

- **Lydia Kallipoliti**, Assistant Professor, Cooper Union, New York.
- **Prof. Sanjeev Gupta,** Professor of Earth Science, Imperial College London.

Chaired by **Justin McGuirk,** Chief Curator, the Design Museum.

17:45 – 18:00 **Closing Remarks**

Workshops and Displays

10:00 – 21:00

A series of pop-up displays and workshops can be found in the Design Museum, created by students from Imperial College London's *Innovation, Design and Engineering* programmes.

Display
Level -1

MARS MAKE-A-THON

The early stages of human life on Mars will require settlers to be able to rapidly hack, improvise and adapt to unforeseeable challenges. Discover a selection of proto-types and displays from the second edition of the Created during the latest edition of Imperial College London Make-a-thon, which focused on the challenge of Moving to Mars.

The Imperial Make-a-thon 2020 is supported by Autodesk and the Design Museum.

Workshop
Common Room, Level 1

10:00 – 16:00 only

MARS FUTURES

Who gets to decide what life on Mars might be like, and if we should even be going? How can participatory design expand the possible futures available to us?

Contribute to a collective map of questions and possible futures in this drop-in workshop with designer Finn Strivens. Drawing on current research from Imperial College London's Space Lab, this workshop invites participants to proto-type objects, discuss potential scenarios, and share their insights over the course of the symposium.

Drop-in, no booking required.

Display
Atrium, Level 1

MARS MATERIALS

Mars creates pressing challenges for the production of food, fuel and materials on the red planet. Any form of agriculture will need to be resistant to alien soils, large variations in temperature and minimal water supplies.

Inspired by the work of Exobiologist Dr Wieger Wamelink, the first section presents a series of bio-material samples, proto-types and diagrams that explore the possibility of growing potatoes on Mars.

The second section looks at the role Halophytes might play on the red planet. A hardy group of plants defined by their salt tolerance and ability to withstand harsh conditions, this display looks at how these plants could be adapted on Mars as a water-treatment system, food and source of textiles.

Exhibitors include David Prior Hope, Bettina Sosa Rhl, Luke Hillery, Max Hunt and Higor Alves de Freitas, Julian Ellis-Brown, Finlay Duncan, Antonia Jara and Neloufar Taheri.

Speaker Biographies

Jonathan Eastwood is Director of the Imperial Space Lab network of excellence, and a Senior Lecturer in Physics in the space and atmospheric physics group. His primary research interest is space weather and how it affects modern society, and which also represents a major challenge to one day living and working on Mars.

Mále Uribe Forés is a Chilean architect working at the intersection of art, architecture and interiors. With an MA in Information Experience Design from the Royal College of Art, and a professional background in spatial and exhibition design, she develops spatial narratives that communicate ideas about material culture in architecture. She is one of the Designers in Residence 2019 at the Design Museum where she has been exploring minerals and extractive processes from the Atacama Desert in Chile.

Sanjeev Gupta is a geologist and planetary scientist. He explores the archive of sedimentary rocks to replay what ancient landscapes looked like on Earth and Mars. He is a Long-Term Planner on NASA's Mars Science Laboratory Curiosity rover mission, where his role is to determine if the Red Planet could ever have been habitable for life. He is heavily involved in the European ExoMars rover mission and the NASA Mars 2020 mission.

Lydia Kallipoliti is an architect, engineer and scholar whose research focuses on the intersections of architecture, technology and environmental politics. She is an Assistant Professor at the Cooper Union in New York and the author of the awarded book *The Architecture of Closed Worlds, Or, What is the Power of Shit* (2018). She is the principal of ANAcycle thinktank, which has been named leading innovator in sustainable design in Build's 2019 awards.

Tom Pike is Professor of Micro-engineering at Imperial College London, where his research focuses on the development of micro-instruments for space and terrestrial applications. He was part of the Mas Insight Team behind the Mars Phoenix Lander, a NASA probe sent to study the deep interior of Mars, which successfully landed there in November 2019.

Anna Talvi is a microgravity-wear designer working on how to keep astronauts fit and healthy when they are living in space for longer periods of time. Her work is a symbiosis of design, biomedical engineering and material science to tailor better spacesuits and microgravity wear for the astronauts.

Mars: Designing for the Red Planet is co-organised by Eleanor Watson, Justin McGuirk and Bernard Hay (the Design Museum), and Dr. Stephen Green and Elena Dieckmann (Imperial College London).