

News Archive Space 2010

520 days on a simulated flight to Mars

1 June 2010



Container hatch – on 3 June 2010, it closes for 520 days

Mars500 will deliver insights into long-duration spaceflights

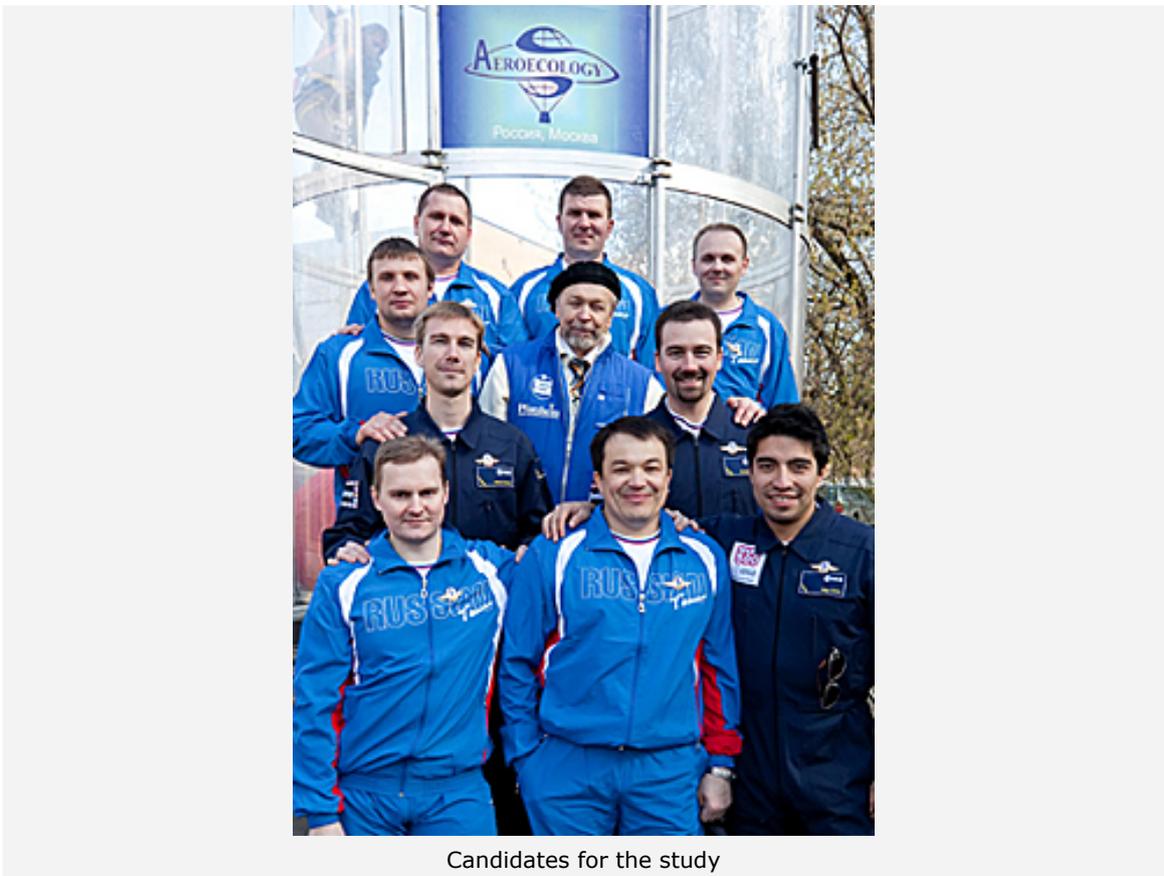
On 3 June 2010, six 'astronauts' will commence a virtual trip to Mars. Sealed into a cramped container at the Moscow Institute of Biomedical Problems (IBMP) for 520 days, they will experience the rigours and isolation of long-duration spaceflight. This marks the start of the main part of the Mars 500 experiment, and on completion will constitute the longest ever space simulation experiment. Scientists from the German Aerospace Center (DLR) and other German research institutions such as the Charité medical school in Berlin are 'back on board', along with staff from the universities of Erlangen and Bonn.

When the hatch closes on 3 June, the six-person crew from Russia, Europe and China will set out on their simulated 520-day journey to the Red Planet. For their virtual outbound leg, they will need 250 days, then have scheduled 30 days for their 'stay' on Mars, after which the crew embarks on its 240-day return journey to Earth. The experiment will take place in a special-purpose test facility at the IBMP in Moscow, where the previous 109-day experiment was conducted in 2009. With the exception of weightlessness and exposure to radiation, in-space conditions will be simulated as realistically as possible. The crew will experience isolation, food and emergency situations of the kind they would encounter on a real long-duration mission. During these 520 days, about 100 tests are planned, covering the fields of psychology, psychophysiology, clinical diagnostics, physiology and microbiology.



Simulated flight to Mars in a containerised landscape

Crew needs a high level of autonomy



Candidates for the study

Whether on their way to Mars or to some other planet, a high degree of autonomy is required from any crew on a long-duration mission of this nature. The crew must maintain and service their technical

systems without help from any external source. The effects of isolation on their psychological and physiological health and performance capabilities are of particular interest to the scientists involved.

During this long-duration mission, German scientists will be investigating the group dynamics and psychophysiological performance capabilities of the crew. They will also examine how astronauts deal with illness or emergency situations. Another group of researchers will examine how, inside a sealed system, the microbiology and health of a crew develop. The German scientists will also be monitoring the crew's salt and fluid levels, blood pressure regulation and bone metabolism. To investigate physiological questions associated with nutrition, eight German companies are collaborating with the University of Erlangen to provide the team with selected products.

Tests conducted by German scientists during Mars500

- DLR Institute of Aerospace Medicine, Hamburg, Dr Bernd Johannes: Group-dynamic processes as well as computer-based training of complex control tasks
- DLR Institute of Aerospace Medicine, Cologne, Dr Petra Rettberg: Microbiology and health in sealed systems
- DLR Institute of Aerospace Medicine and the University of Bonn, Dr Natalie Bäcker: Bone metabolism
- DLR Institute of Aerospace Medicine, Cologne, Dr Luis E.J. Beck: Blood pressure regulation
- University of Erlangen, Prof. Jens Titze: Long-term salt and fluid levels in the body
- Charité Center for Space Medicine, Berlin, Prof. Hanns-Christian Gunga: Circadian rhythms during long-term isolation
- Charité Center for Space Medicine, Berlin, Dr Ulf Gast: Physical fitness through vibration training
- Ludwig-Maximilian University, Munich, Prof. Alexander Choukér: Psychophysiological performance capabilities
- German Sport University Cologne, Dr Stefan Schneider: Psychophysiological performance capabilities
- Johannes Gutenberg University, Mainz, Prof. Dr Wolf Mann: Autonomous emergency medical care for patients

Related Contacts

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