

# The Voice of Russia

## Mission to Mars

Tags: Sci-Tech, Mars 500 experiment, Russia, Commentary, World

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Sep 6, 2011 16:29 Moscow Time



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The blinking screen of a monitor shows a strange date: day 441 of the year 2019. But it's not a science fiction movie or a computer game. Figures on the monitor in the mission control room mark the countdown for a unique international experiment Mars500, held at the Institute of Medical and Biological Problems in Moscow. A group of astronauts have already set a new record for a space flight: 441 days. That equals 73 return trips to the Moon. The Russian Federal Space Agency and the European Space Agency are partners in the project.

**Vadim Gushchin**, Head of the Laboratory of Social Psychology, highlights the multicultural basis of the experiment: "The research basis of Mars500 is really very big and comprises a lot of spheres like psychology, chemistry, physiology and also some operational issues and biology. The total amount of studies is more than 100. For each study we have a Russian sight, we have a European sight with more than 30 studies, we have China and we have the US, as a research partner. We can say that in any experiment at least three or four scientists are involved. So, in total, it's about 1,000, if we speak about the scientists directly involved in Mars500."

American involvement in the project is limited, yet not less valuable. The Space Biomedical research Institute from the US is something similar to the Russian institute and Dr. Gushchin says how the expertise of American colleagues helps in the research: "David Dinges, who is representing the US bureau, is the most prominent American space psychologist. The area of his research is cognitive testing and I think this is a good example of real cooperation between the US and Russia in the area of space psychology."

A special ground-based experimental station with the total area of 1,722 square feet resembles a spaceship with separate cabins, a module apparatus and an exercise section. Selection process for Mars500 was long and competitive, with hundreds of applicants from 26 countries. Today, six volunteers – three Russians, one Italian, one French and one Chinese – live on the simulated orbit and use English for communication.

Dr. **Igor Nechiporuk**, the leading scholar at the Laboratory of Metabolism and Immunity, stresses the key goals: "The main idea of this experiment is how an international crew can overcome some difficulties, some problems, which can arise during a real space flight to Mars. We also have a lot of problems concerning psychological questions, first of all, questions about personality changes during the experiment, questions concerning possible conflicts between the members and some questions concerning possible grouping of our volunteers."

Red is the colour Mars is usually associated with. But today all the images captured by cameras from experimental modules are bluish. I wonder why it is so. Apparently, the blue picture on the monitor is part of the experimental program. The crew members are collecting data to analyze the influence of the blue spectrum on the human immune system. Italian crew member **Diego Urbina** explains the results: “Dr. Nechiporuk ordered a clarification and we started with a computer test at about 2 p.m. And we will continue it throughout the whole session as told until 2 p.m. tomorrow, when we will turn on the lights.”

It's hard to imagine how six people can stay together for so long in a closed space. Apart from conducting experiments such as collecting blood, saliva, filling numerous psychological questionnaires, they have to co-exist, day after day, month after month, for 520 days. What happens to people's minds? How does it affect their bodies? The main psychological problem during long periods of isolation is space asthenia. This is a reaction of the central nervous system to the lack of information. The deficit of contact with the outside world is one of the main research subjects. “Even if we are isolated from everything and everybody, we still try to make the best of our every day,” one of the crew members wrote in his blog. Dr. Igor Nechiporuk tells us that psychological support and hobbies can help people cope with isolation and stress. On a daily basis, even during a busy work day, crew members have four hours of spare time when they can relax. “They have their local so-called jazz band, some of them play a guitar, some of them play an electric piano. So, activity is also used during the celebration of some holidays or birthdays. They also did some attempts to prepare special meals.”

Chief Operating Officer of the Mars500 Project, **Aleksandr Suvorov**, believes that the current experiment is difficult to overestimate: “Our studies of isolation in the 520-day experiment are certainly needed as a foundation for future missions. It will be possible to fly not only to Mars but maybe to other planets of the Solar System as well. “

The Mars500 Project still has 78 days to go. On November 4, the station will return to earth.