

# Mars mission arrives in 'orbit'

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Space travellers prepare to visit simulated Mars.

**Katharine Sanderson**



Six volunteers are living in this facility for 520 days to simulate a mission to Mars. ESA

For the past eight months, six men ♦ one Chinese, three Russian, one French and one Italian ♦ have been isolated in three small rooms in the bowels of the Institute of Biomedical Problems in Moscow. They will stay there for a total of 520 days, simulating the isolation of a journey to Mars and back.

Last week, the Mars500 crew arrived in 'orbit' around Mars and its members are preparing to split into two groups, one of which will simulate a trip to the planet's surface. Despite a 20-minute delay in communications, Nature managed to speak to Romain Charles and Diego Urbina, the two European Space Agency members of the crew.

## **What's a typical day like?**

DU: It starts with us doing the daily medical check. We do blood pressure tests and some psychological tests about how we are feeling when we wake up, and then we do urine samples. There are computer games to test different parameters of your psychology ♦ things that scientists foresee could change over a long-term flight from Earth to Mars.

## **What kind of biomedical monitoring are you doing?**

DU: There are about 100 experiments. They are monitoring our body composition, the antibodies in our blood, our stress levels with saliva samples, and things like skin conductance and brain activity before and after exercise to test the benefits of exercise for a crew in long-term space flight.

RC: I'm sure there are some evolutions inside our body. So far, the most obvious sign of change is our tan ♦ we are nearly all white now, except for Diego and Wang Yue.

## **What happened when you reached orbit, and what will you do during the landing?**

DU: When we reached orbit we could access the Martian landing module and retrieve goods that were stored there ♦ including things that had been left by our families ♦ so that was a happy moment for us. It changed a lot, from the monotony of our trip to this moment in which we had new activities, new goods, new items and a new space to be in.

In the coming days we are training for the Martian surface operations and will be separating. Three of us ♦ Alexandr Smoleevskiy from Russia, Wang Yue from China and I ♦ will be going to the Martian lander, which is about 50 cubic metres in volume, and we will be living there for just over two weeks. There we will do several real and virtual-reality activities: we're going to do three extravehicular activities and will also drive a real rover on the simulated Martian surface on the second floor of the institute. Obviously, we will not see or have contact with anybody. On 27 February we will be coming back to our orbiter.



The Mars500 crew celebrates Chinese New Year. Romain Charles is second from right in back row, Diego Urbina is on the right in front row. ESA

RC: During this landing, the Martian base will not always be reachable so we have to make sure that we understand at what time we can contact them to ensure that all the information is passed correctly and relay those communications to Earth.

## **How will this experiment help in real trips to Mars?**

RC: There are a lot of technical problems to be solved before sending a human to Mars. One factor that hasn't been studied much before is the psychological effect, especially the effect of confinement on humans.

DU: Although this experiment is directly focussed on travelling to Mars and long-duration space-flight missions, it also has myriad applications on Earth. For instance, we're testing the use of blue light to simulate the light from the Sun. In the last month of the mission we're going to have this blue light everywhere, which could be used to help people with seasonal mood disorders.

## **What has been the most difficult thing for you so far?**

RC: Food. The food is good, it's a European diet but it's a very strict diet. It is an experiment in itself; a German scientist is following the salt levels in our bodies, so he has to know exactly what


we have eaten each day. For the second part of the mission it will be a Russian and Korean diet so it could also be difficult.

DU: Being isolated from my friends and family. We have e-mails relayed with some delay but it's not the same as being able to talk live to the people you love. When you get an e-mail from your friends it makes a difference and really influences your mood.

### **Have you been tempted to leave at any point?**

RC: The idea has never crossed my mind. I want to stay here until 5 November 2011. As it is an experiment we have the right to say stop, but all of us really want to go through the whole experiment, we want to answer yes to the question 'Is man able to go to Mars?' from a psychological and physiological point of view.

### **How difficult is it to keep up the pretence that you are not in Moscow, but on the way to Mars?**

DU: Sometimes you feel so isolated from everyone that you think you might as well be in Siberia or at the bottom of the sea  or travelling to Mars for that matter. But there are other things that shatter the illusion. Every so often, for example, we have to put biological samples in the airlock. We don't see anybody when we do that, but someone opens the door at some point and you can hear it clanging. In general, when you're just alone in some module without anybody near it's easy to feel you're far from everything.

### **Would you like to go to Mars for real?**

RC: If I was asked I would definitely say yes and I would sign the contract at once.

DU: I certainly would go to Mars if asked. I'm happy that I'm able to give a contribution that will be useful for the first person that will step on Mars some years from now. I hope that I will at least live to see it.