



'Living on Mars' – for four months

27 March 2014

Lucie Poulet said goodbye to the outside world for four months when the door closed behind her on 28 March 2014; the scientist from the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) is participating as a crewmember in a Mars simulation run by the University of Hawaii at Manoa. Among other things, the scientist will use the second mission within the Hawaii Space Exploration Analogue and Simulation (HI-SEAS) programme to study the influence that light of different wavelengths exerts on plants. However, she will also be the subject of keen observation – the University of Hawaii is using the habitat to examine how the six participants behave and work together during the months of isolation.

Lucie Poulet's new home, a habitat that will feel like living on Mars, is close to a collapsed lava tube in a former quarry on the northern slopes of Mauna Loa. Situated over 2400 metres above sea level, the dome does not offer a great deal of comfort. With a diameter of just 11 metres, the two-storey habitat accommodates six bedrooms, a kitchen, a bathroom, a dining area, communal space and laboratories. Twelve minutes under the shower per week, trips outside only while wearing a space suit, and specially packaged, and in some cases, dehydrated food – just like during a space mission.

Lettuce and radishes on the menu

Nevertheless, Lucie Poulet will make sure that some fresh food makes its way into the isolated Mars habitat. Her task is to examine three LED light systems that might be suitable for cultivating vegetables in remote regions of Earth or during long-term space missions. Lettuce, radishes and tomatoes – these are the things that the scientist is looking to grow in a greenhouse. "First of all, it is important to find out which light offers the greatest efficiency; secondly, to determine how much time the crew needs to spend tending the plants during a long-term mission," explains Poulet. Lettuce and tomatoes could freshen up the menu in a station on Mars, but before that can happen it is necessary to test the installation and maintenance of the greenhouses. Lucie Poulet is busy conducting these experiments in the newly established Evolution and Design of Environmentally-closed Nutrition sources (EDEN) laboratory at the DLR Institute of Space Systems. The effect that plants have on the human psyche is also part of the research; coupled with suitable lighting, it is hoped that the greenery will foster a sense of well-being in the communal area.

Delayed communication

Supported with 1.2 million euros from the US space agency NASA, the mission will permit only limited contact with the outside world. Lucie Poulet and the other crewmembers will have restricted Internet and email access to the world beyond their Mars habitat. And, since it takes 20 minutes for a signal to reach Mars, the habitat dwellers will have to tolerate the same delay. The scientist will receive regular messages from pupils in Bremen, where the local DLR-School_Lab has selected four classes and given them two challenges: to cultivate their own plants and, once a week, send questions to Poulet and her crew members about this project and other topics of interest. The virtual Mars inhabitants will send their answers as video messages.

Lucie Poulet gained her first experience with simulated life on Mars at the start of the year, moving to the Mars Desert Research Station in the United States. Now she is looking forward to the next four months, when she will join an international crew and live in a habitat designed to simulate life in space. "I am really thrilled to be going there. It will be very exciting and extremely

intense." The scientist will open the door of her habitat once again on 28 July 2014 – and with just one small step leave her life on Mars and return to Earth.

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Mars habitat on Hawaii



The Mars Habitat, run by the University of Hawaii at Manoa, is situated close to a collapsed lava tube in a former quarry on the northern slopes of Mauna Loa. Situated over 2400 metres above sea level, the dome does not offer a great deal of comfort. With a diameter of just 11 metres, the two-storey habitat accommodates six bedrooms, a kitchen, a bathroom, a dining area, communal space and laboratories.

Credit: University of Hawaii at Manoa.

Lucie Poulet with the crewmembers



For four months, Lucie Poulet (third from the left), a scientist at the German Aerospace Center (DLR) Institute of Space Systems, will be a member of the international crew living and conducting research in the Mars habitat run by the University of Hawaii at Manoa.

Credit: Ross Lockwood.

Mars simulation in USA



Lucie Poulet, a scientist at the German Aerospace Center, gained initial experience with life in a Mars habitat by spending two weeks in the Mars Desert Research Station (MDRS).

Credit: MDRS.

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