

The next-best thing to being on Mars

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Crewmembers of an earlier mission at the Mars Society Desert Research Station in Utah set out for an exploratory trip on their all-terrain vehicles, wearing simulated space suits. Photo courtesy / The Mars Society

Last week, two MIT students began living, working and communicating with the outside world as if they were on a mission to Mars. Whenever they go outside their small, round habitat where eight people are spending a two-week "mission," they don spacesuits and pass through an airlock. When they send e-mail, it takes 20 minutes before the recipient can see it-the time it takes for radio waves to travel to and from the red planet.

They're not really on Mars, of course-human missions there are not yet even in NASA's long-term schedule and are not expected to take place

for at least two decades. So, in order to begin understanding the logistical, mechanical, scientific and psychological issues that a real crew of Mars explorers will someday face, teams have been practicing the details of Mars exploration in several Mars-base simulators in some of Earth's most Mars-like places. The most heavily used simulation is the Mars Society Desert Research Station, near Hanksville, Utah, which was built in 2002 by the Mars Society.

Engineering graduate students Zahra Khan and Phillip Cunio, from the Department of Aeronautics and Astronautics, began their stay at the Utah facility on Sunday, Feb. 17. Cunio is working on a project to develop a "smart" carrier to be used for research fieldwork in remote expeditions such as planetary exploration. The footlocker-sized container and its contents are fitted with radio-frequency ID tags, so that it constantly keeps track of its contents and can alert people if supplies are about to run out or if an item has been misplaced. Running out of supplies is not just an inconvenience-on a faraway planetary surface it could be a life-or-death issue.

Khan's job was concentrating on the logistics of making exploratory trips through the desert to carry out geological and biological research. The team uses all-terrain vehicles to travel around while wearing their simulated spacesuits and then takes soil samples and conducts other tests at various locations. Halfway through the planned two-week mission, Khan cut her stay short when she was unexpectedly called to Amsterdam for a job interview with the European Space Agency.

Although part of the mission's purpose is to find out about practical issues in working in difficult circumstances, the research itself is also very real. They have been looking for organisms that live in the hostile, dry and salty desert environment, both to develop techniques for conducting such biological research and to learn about how organisms survive in these somewhat Mars-like conditions.

Both Khan and Cunio would like to be involved in real Mars missions someday. Khan's research is on entry, descent and landing systems for human missions to Mars. These will require much gentler, more-controlled descents than past missions, such as the Mars rovers that hit the ground at high speed shielded by airbags and then bounced for several minutes before coming to a stop.

Khan says she would like to go to Mars herself, but thinks that with the slow progress of NASA's plans in that direction, "the odds may not be very good. I think it would be a good idea to send younger people," and by the time such missions take place that may leave her out.

"I'm an advocate of one-way trips to Mars," she says, because the logistics of such trips would be far easier without the requirement for all the fuel needed for a return. For a given spacecraft, she says, you could send six people on a two-way mission or 24 people for a one-way trip. "If you're going to go there, you might as well not waste the resources."

Cunio's research studies the design of self-sustaining life-support systems for Mars colonists, as well as for missions to the moon or other destinations. "We're studying the commonalities in life support and environmental control systems," he says, so that planners don't have to start from scratch in planning missions to different places. "We want to minimize the development costs and risks."

Anyone interested in following the progress of the Mars-like mission can observe the team in action by way of a set of web cams that display live images inside and outside the habitat, at www.freemars.org/mdrscam . Detailed daily reports on their activities can be found online at www.marssociety.com/mdrs/fs07/crew67 (click on "daily crew reports").

Cunio is also blogging about his experiences during the mission, mainly as a way of helping to inspire younger students to get interested in space

exploration. His blog is at exepsilonmars.blogspot.com. Cunio has made contact with several schools around the United States and Canada, and will participate in real-time question-and-answer sessions with some of the classes during the mission.

Source: MIT, by David Chandler

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