Eight months on 'Hawaiian Mars' tests rigors of exploration

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The HI-SEAS (Hawaii Space Exploration Analog and Simulation) habitat where six researchers have began an eight-month test of how their mental health might fare during a mission to Mars

Six people have sealed themselves inside a white vinyl dome in Hawaii to embark on an eight-month test of how their mental health might fare during a mission to Mars.

The NASA-funded project, the longest US Mars simulation yet, involves

three men and three women who have no access to fresh food and limited access to Internet that requires 20-minute intervals between click and response, as it might be in deep space.

They are allowed to venture outside their igloo-like enclosure—which measures 36 feet (11 meters) in diameter and 20 feet (six meters) tall—only if wearing a spacesuit.

"We are surrounded by basaltic lava and living in isolation on the slopes of Mauna Loa where there is little evidence of plant or animal life," wrote crew member Jocelyn Dunn, a doctoral candidate at Purdue University's School of Industrial Engineering, after her first day in the dome on October 17.

"The training wheels are coming off as our new reality is setting in," Dunn wrote on her blog, which she plans to update throughout the mission.

NASA is spending $1.2 million on a series of three such projects known as Hawaii Space Exploration Analog and Simulation (HI-SEAS) to determine the potential pitfalls of sending people together to spend long periods in close quarters on a distant planet.

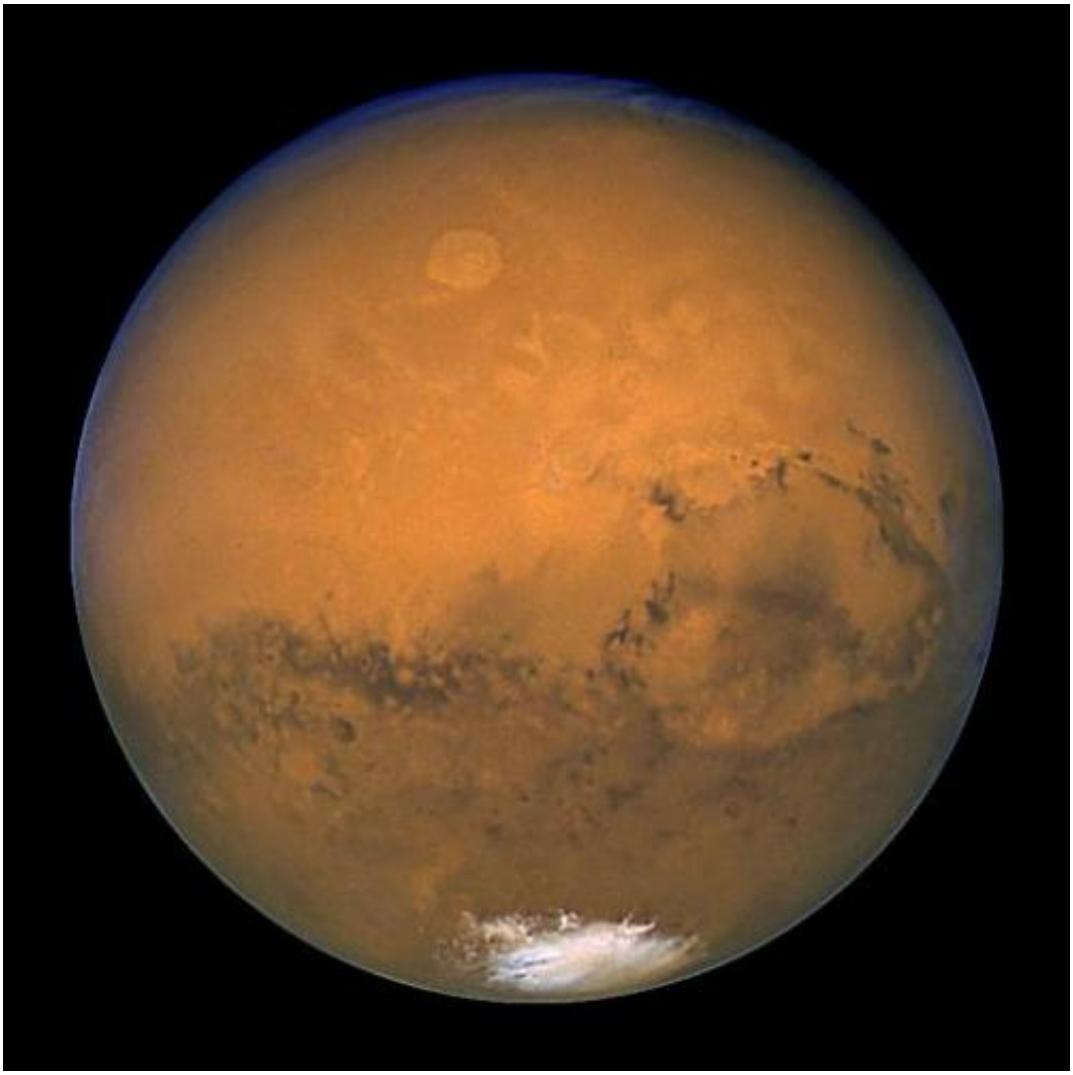
Risks, reality

NASA is aiming for a human mission to Mars mission by the 2030s, but experts are still not sure if humans can withstand the radiation that the journey would involve.

It could take eight months to reach the Red Planet, not to mention time spent on an orb with a thin atmosphere and no known food source, followed by an attempt at returning to Earth.

One recent study found that with the current limits of technology, adventurers to Mars would start dying in 68 days. Another study out this week said the risk of radiation-induced cancer would limit any trip to one year.

NASA deems it just as important to study whether people's mental states could hold up under the pressure of a Mars journey, said principal investigator Kim Binsted.



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Both crew psychology and radiation are considered "red risks" for Mars, "which means essentially, until we solve these problems, we are not going," Binsted told AFP.

Binsted is coordinating the experiment from the outside the dome. Those inside are healthy, educated people in their 20s and 30s, each with a keen interest in science and space.

"It is kind of the opposite of a reality show. We select against drama," explained Binsted.

"We try to pick a crew that will get along with each other, be cohesive. We pick generally level-headed and easy-going people."

They include Allen Mirkadyrov, an aerospace engineer for NASA and Neil Scheibelhut, a microbiologist and former combat veteran in Iraq.

Sophie Milam is an expert in robotics who is pursuing a master's degree in engineering, and Zak Wilson is mechanical engineer.

The commander is Canadian-born Martha Lenio, who earned a doctorate in photovoltaic engineering and has worked in the sustainable building industry, according to her biography.

As time wears on, experts want to see how they get along with each other, and how they relate to mission control.

Third-quarter syndrome

One potential problem may come late in the game, when a depression known as "third-quarter syndrome" kicks in. The simulation is no longer as fun as it was at the start, and the end is not quite near.

There is also the issue of communication breakdown between the crew and ground control, which happens often in these kinds of missions, Binsted said.

"The crew basically comes to the conclusion that mission support doesn't understand what they are going through, is asking too much of them and isn't providing enough support," she said.

"Meanwhile, mission support gets the idea that the crew is being prima donna-ish. 'Why won't they do this one thing that we need them to do?' It is a very common kind of communication breakdown."

HI-SEAS will also test a technology that does not record the crew's every word, but keeps track of the volume of their voices and their proximity to others, to see if a person is self-isolating, or if there are arguments between certain people.

Other simulation experiments have taken place under the sea off the Florida coast, in Antarctica and in Russia, where a 520-day Mars experiment was carried out in 2011.

Each has its own strengths, Binsted said.

"If we see problems arise in this environment, we can be confident that those problems are going to arise in space."

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