Hi-SEAS and Mars Society kick off new season of missions

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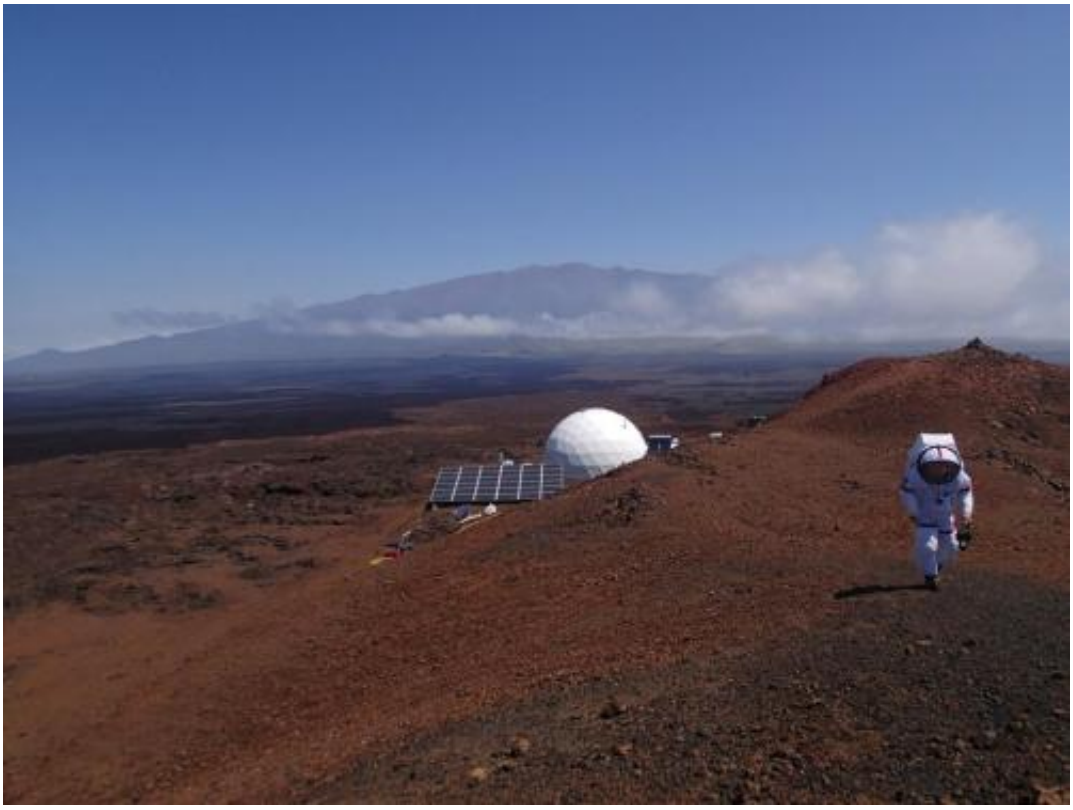

The Hi-SEAS habitat module on the slopes of Mauna Loa, Hawaii. Credit: Hi-SEAS

The Hawaii Space Exploration Analog and Simulation (aka. Hi-SEAS) – a human spaceflight analog for Mars located on the slopes of the Mauna Loa volcano in Hawaii – just kicked off its third research mission designed to simulate manned missions on Mars.

Located at an elevation of 2500 meters (8,200 feet) above sea level, the analog site is located in a dry, rocky environment that is very cold and subject to very little precipitation. While there, the crew of Mission Three will conduct detailed research studies to determine what is required to sustain a space flight crew during an extended mission to Mars and while living on Mars.

The six-member team includes Martha Lenio (Commander), Allen Mirkadyrov, Sophie Milam, Neil Sheibelhut, Jocelyn Dunn, and Zak Wilson, with Ed Fix and Micheal Castro in Reserve. This crew will spend the next 254 days living in conditions that closely resemble those present on the Martian surface.

Research into food, crew dynamics, behaviors, roles and performance, and other aspects of space flight and a mission on Mars itself is the primary focus. This will be the third of four research missions conducted by Hi-SEAS and funded by the NASA Human Research Program. The information gleaned from these research studies, it is hoped, will one day help NASA conduct its own manned missions to the Red Planet.

For the course of their research studies, the crew will be living in a dome that is 11 meters (36 feet) in diameter and has a living area of about 93 square meters (1000 square feet). The dome also has a second level that is loftlike – providing a high-ceiling is crucial to combating long-term feelings of claustrophobia.

The six crew members will sleep in pie-slice-shaped staterooms, each of which contains a mattress, desk and stool. Their clothing is stored under the bed, which sits at the wide side of the slice. They do their business in a series of composting toilets that turn their repurposed feces (the pathogens are removed) into a potential source of fertilizer for the next mission.

Artist conception of a Hi-SEAS habitation dome. Credit: Blue Planet Research/Bryan Christie Design

A workout area provides the astronauts with an opportunity to stay in shape with such exercises as video aerobics, juggling, and balloon volleyball. And communications are conducted through NASA-issued email addresses – with an artificial delay to simulate the time lag from Mars – and access to a web made of cached, nondynamic pages.

To complete the illusion of being on Mars, when the crew are not in their pressurized habitation dome, they will be walking around in space suits. The mission will conclude on July 14th, 2015, with a fourth and final mission to take place at a so-far undetermined date.

In related news, the Mars Society announced yesterday that Crew 142 arrived at the Mars Desert Research Station (MDRS) in southern Utah to

begin the 2014-15 MDRS field season. Crew 142, consisting of seven people, is the first of three crews composed of finalists for the planned Mars Arctic 365 (MA365) mission that will serve at MDRS for two weeks of training and testing.

Once their training is complete, crew 142 will be shipping off to the Flashline Mars Arctic Research Station (FMARS) located on Devon Island in northern Canada, followed shortly behind by the other MA365 finalists, for a year-long research stint.

Much like the Hi-SEAS project, the Mars Society is a non-profit space advocacy organization that is dedicated to promoting the human exploration and settlement of Mars. Established by Dr. Robert Zubrin and colleagues in 1998, the organization works to educate the public, the media, and government on the benefits of Mars exploration and the importance of planning a manned mission in the coming decade.

For the next two weeks, the seven finalists will be engaged in activities designed to simulate conditions on another planet. For the duration, they will be living and working in the Mars Analog Research Stations (MARS) – a prototype of the habitat that the Mars Society plans to eventually land on Mars and serves as the crew's main base as they explore the harsh Martian environment.

The Mars Society's Mars Desert Research Station in southern Utah. Credit: Mars Society MRDS

Ultimately, these analog experiments offer NASA and other space research groups the opportunity to carry out field research in a variety of key scientific and engineering disciplines that will help prepare humans to explore Mars in the coming years.

For one, it lets research crews know what kinds of work they can physically do when fully suited up, and just how well their suits can hold up to months' worth of activity. At the same time, it allows for psychological studies and human factor issues – like testing the effects of isolation on human beings, and whether or not the habitats will suffice for long periods of occupation.

Above all, it lets us see how human beings with different skills sets and tasks can function together as a whole in a Martian environment. On any given day, astronauts in these analog environments are tasked with working within the pressurized habitats, out in the field, or far away using pressurized rovers or un-pressurized vehicles.

FMARS hab with Mars flag in foreground. Credit: Mars Society

At the same time, it offers the opportunity for research crews to test out being in an isolated environment, connected to mission control and the terrestrial scientific community only through official communications.

And of course, there's also the matter of the astronauts' being connected to each other and robots in the field. Making these different assets work together to achieve the maximum possible exploration effect requires developing a combined operations approach, which is another aim of Hi-SEAS, the Mars Society, and other research groups.

More information: hi-seas.org/?p=3275
www.marssociety.org/home

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