Mars Desert Research Station Project

Hanksville, Utah
Devon Island, Canada
Australian Outback
Iceland

A Program of the Mars Society

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Introduction

Mars Image from the Hubble Telescope

Mars has fascinated us, ignited our fantasies of advanced civilization outside our own home world, and has fired our determination to travel to the Red Planet in hopes of settlement and exploration. It is rumored that it takes six months to travel to Mars and that humans would not be able to endure the trip, let alone survive on a planet that no human has set foot upon. Our ancestors strove for a New World, with adventures and a new way of life for them and their loved ones. They took only what they needed to survive and lived off the land. Of course, they did not have a technologically advanced civilization as we do today, thus, we have for better chances of surviving a trek such s to Mars. Right? Some think it is utterly impossible and say that it is best to stay on Terra Firma. Others, like Dr. Robert Zubrin of the Mars Society, think differently. He, as well as many others, believe that we have come a long way and now is the time to break away from our traditional near Earth orbit and discover a new world with our own eyes, hands, and spirit of exploration. The time of orbiters and landers to the Red Planet is coming to an end. We are rapidly approaching the end of Reconnaissance Exploration. Nw, humans enter a time in history where we take the next step in exploration. We send a human mission to Mars.

Why you ask? To do what orbiter satellites and landers cannot achieve. We will travel from our own world, build the first colony to house fragile beings from a harsh environment, conduct experiments which can only achieve results by being in the environment where samples of rock and atmosphere ate at their purest. To search for Life! Is there life on Mars? We have evidence that supports the theory that life did thrive on Mars due to the ever growing images of proof from the Mars Global Surveyor and the new THEMIS mission which has already given us the first images of the Earth and Moon from a great distance as well as its first image of Mars. With the Mars Desert research Station [MDRS] in Hanksville, Utah, the Mars Society hopes to achieve high quality Martian analog studies. Everything from extravehicular activity, spacesuit design, greenhouse design, and transport will be investigated. We hope to define the protocols necessary to explore, strive, and understand Mars.

Come... and join us in our adventure!

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Concepts

Mars Analog Research Stations are laboratories for learning how to live and work on another planet. Each is a prototype of a habitat that will land humans on Mars and serve as their main base for months of exploration in the harsh Martian environment. Such a habitat represents a key element in current human Mars mission planning. Each station's centerpiece is a cylindrical habitat, "The Hab," an 8 meter diameter, two deck structure, mounted on landing struts. Peripheral structures, some inflatable, may be appended to the Hab as well. Each station will serve as a field base to teams of four to six crew members: geologists, astrobiologists, engineers, mechanics, physicians, and others, who live for weeks to months at a time in relative isolation in a Mars analog environment. Mars analogs can be defined as locations on Earth where some environ-mental conditions, geological features, biological attributes or combinations thereof may approximate in some specific way those thought to be encountered on Mars, either at present or earlier in that planet's history. Studying such sites leads to new insights into the nature and evolution of Mars, the Earth, and life.

However, in addition to providing scientific insight into our neighboring world, such analog environ-ments offer unprecedented opportunities to carry out Mars analog field research in a variety of key scientific and engineering disciplines that will help prepare humans for the exploration of that planet. Such research is vitally necessary. For example, it is one thing to walk around a factory test area in a nw spacesuit prototype and show that the wearer can pick up a wrench - it is entirely another to subject that same suit to two months of real field work. Similarly, psychological studies of human factor issues, including isolation and habitat architecture are also only useful if the crew being studies is attempting to do real work. Furthermore, when considering the effectiveness of a human mission to Mars as a whole, it is clear that there is an operations design problem of considerable complexity to be solved. Such a mission will involve diverse players with different capabilities, strengths, and weaknesses. They will include: the crew of the Mars habitat, pedestrian astronauts outside, astronauts on unpressurized but highly nimble light vehicles operating at moderate distances from the habitat; astronauts operating at great distances from the habitat using clumsy but long-endurance vehicles such as pressurized rovers;mission control on Earth; the terrestrial scientific community at large, robots, and others. Taking these different assets and making them work in symphony to achieve the maximum possible exploration effect will require developing an art of combined operations for Mars missions.

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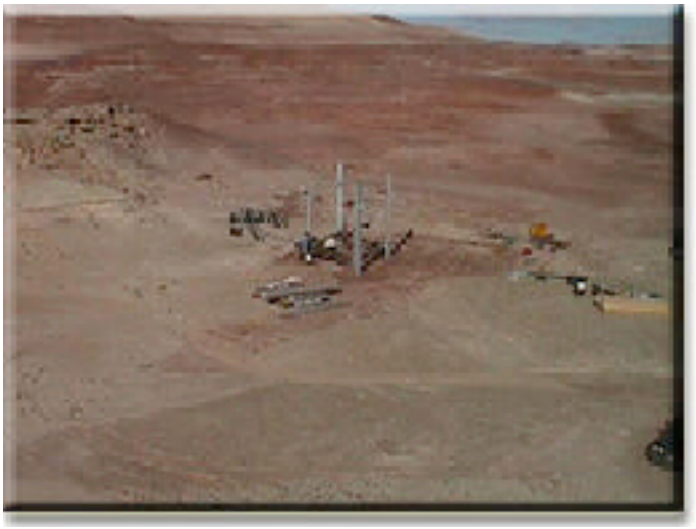
Concepts



The Mars Desert Research Station (MDRS) is located in the desert in southern Utah a few miles west of Hanksville. Together with its companion station, the Flashline Mars Arctic Research Station that the Mars Society has built on Devon Island in the Canadian high Arctic, it will enable a year-round program of Martian exploration, operations, and research. Operations, during which crews will attempt to conduct a sustained program of field exploration of the surrounding desert while subject to Mars-mission type constraints, are expected to begin at the MDRS in early January.

Goals

The Mars Society has identified three prime goals to be met by the Mars Analog Research Station Project:

The Stations will serve as an effective testbed for field operations studies in preparation for human missions to Mars specifically. They will help develop and allow tests of key habitat design features, field exploration strategies, tools, technologies, and crew selection protocols, that will enable and help optimize the productive exploration of Mars by humans. In order to achieve this, each Station must be a realistic and adaptable habitat.

The Stations will serve as useful field research facilities at selected Mars analog sites on Earth, ones that will help further our understanding of the geology, biology, and environmental conditions on Earth and on Mars. In order to achieve this, each Station must provide safe shelter and be an effective field laboratory.

The Stations will generate public support for sending humans to Mars. They will inform and inspire audiences around the world. As the Mars Society's flagship program, the MARS project that will serve as the foundation of a series of bold steps that will pave the way to the eventual human exploration of Mars.

Mars Analog Research Stations will be operated by Mars Society researchers and will be made available to NASA and selected scientists, engineers and other professionals from a variety of institutions worldwide to support science investigations and exploration research at Mars analog sites. As an operational testbed, the stations will serve as a central element in support of parallel studies of the technologies, strategies, architectural design, and human factors involved in human missions to Mars. The facilities will also bring to the field compact laboratories in which in=depth data analysis can begin before scientists leave the field site and return to their home institutions. The Stations will help develop the capabilities needed on mars to allow productive field research during the long months of a human sojourn. The facilities will evolve through tie to achieve increasing levels of realism and fidelity with the ultimate goal of supporting the actual training of Mars-bound astronauts.