

Life on Mars

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Have you ever imagined what it would be like to live in space?

Barbara Braun has. In fact, she spent two weeks pretending to live on Mars. She lived in a remote part of Utah at the Mars Desert Research Station (MDRS). She and her team spent every moment of every day behaving as if they were actually in space.

Most of the buildings at the research station are connected by above ground tunnels, like the one seen through this window. The tunnels allow the crew to move to different parts of the station without having to put on a spacesuit.

Hi, Barbara! Your space mission was called an analog mission. What's an analog mission?

It's a mission where we don't actually go into space. Instead, we live and work on Earth as if we were in space (or on Mars, in this case). Our day-to-day work is conducted in a way that is "analogous" to how we would work on Mars. That's why it's called an "analog" mission!

Why do an analog mission?

Analog missions let us test out experiments, processes, and approaches without the expense and danger of spaceflight. In some ways, it's like a dress rehearsal for going to space. We want to make sure we test everything out on the ground, so we don't encounter problems in space.

How long was your mission?

Our mission was two weeks. But we prepared for almost two years. In the beginning, we worked on defining the experiments we would run and learning about the Mars Desert Research Station. As we got closer to the actual mission, we spent more time planning our days.

What did you do on the mission?

I was the Health and Safety Officer. I led a couple of the research topics we investigated during the mission. Like all the other crew members, I helped out with the day-to-day execution of the mission. I participated in extra-vehicular activities (EVAs). An EVA is an activity outside the habitat and requires a spacesuit. I even helped with the maintenance and upkeep of all the facilities we used.

What was the goal of your mission?

Our main goal was to demonstrate how analog missions can be used to test new space technologies. We had several experimental goals:

- demonstrating 3D mapping technologies using drones and rovers
- looking at how crew members can exercise in space
- testing protective mirror coatings
- communicating with family and friends over time delays
- conducting radiation measurements
- testing how to use different tools to take samples

We learned a LOT about living, working, and experimenting in a Mars-like environment. And we achieved all our mission goals!

Your mission took place in the desert in Utah.

Why there?

This area looks a lot like the surface of Mars. And it's where the Mars Society has a space analog facility called the Mars Desert Research Station (MDRS). The MDRS is a private research facility owned and run by the Mars Society. It provides a living and working space that reflects what a habitat on Mars might look like.



During the mission, Barbara did experiments outside the habitat wearing a spacesuit.



Crew members exercised inside the habitat just like they would if they were living on Mars.

What did a typical day on the mission look like?

We would wake up in our bunkrooms in the habitat. We had our own rooms about the size of a closet. We'd eat breakfast in the common area. Our food was similar to the types of food one would eat on Mars. There was a lot of freeze-dried and shelf-stable food. We got very creative with recipes to make the food taste better!

As the Health and Safety Officer, I would do basic health checks on the crew after breakfast. Then, we might conduct experiments outside. This involved putting on a simulated spacesuit, standing in an "airlock" for five minutes, and then going outside. Sometimes, we would use "rovers." Our rovers were basically all-terrain vehicles modified for use with spacesuits to go to more distant locations.

After our experimental work was done, crew members would exercise using fitness bands. After dinner, we would write reports and review our data. Sometimes, we had time to play Pictionary, make artwork, or watch a movie!

Were there any unexpected discoveries?

I learned that astronauts need to be handy! For example, when our spacesuits malfunctioned, we had to repair them ourselves using soldering irons. We had to work in the greenhouse to grow plants for food. One day, our toilet broke down, and I had to fix it. It's not like you can call a plumber or an electrician if you are on Mars!

What developments do you see coming up in the future of living in space?

I'm very excited that we are going back to the Moon! It's going to take not just astronauts, but all sorts of people—like plumbers and welders and electricians—to live and work in space. I am looking forward to seeing everyday people live and work in space.

What concerns do engineers have to consider about living in space?

Radiation is a big problem. We take for granted the protection that Earth's magnetic field and atmosphere provide to people living on Earth. Isolation is also a big problem. This is why we were looking at ways to keep astronauts in touch with their families through texting. Finding the materials we need to build habitats and infrastructure on the Moon and Mars will also be critical. It's not easy to bring building materials with you into space. So, we'll have to work with what we already have there.

How did you get started?

I always liked problem solving and building things. And I was interested in space. I read a lot of books. I took all the science and math classes I could. Eventually, I decided to study aerospace engineering in college. I went to MIT on an Air Force scholarship. After graduation, I worked for the Air Force doing space research.

After breakfast, crew members often put on spacesuits and ventured out of the habitat to work on their experiments.



What advice do you have for students interested in this field?

Follow your passion! You'll always do your best work if you are excited about what you are working on. Read a lot! Read not just non-fiction, but science fiction, too, and other books that envision how we might live and work in space. Get involved in activities that let you try out different things that you are interested in.

What else would students find interesting about your work?

At MDRS, we had to solve problems under less-than-ideal conditions. My training in different fields helped me do this. For example, I have an EMT (emergency medical technician) license. I've also worked in wilderness search and rescue. And I'm a volunteer firefighter. All these experiences helped me prepare for the mission. 🚀

The Mars Desert Research Station (MDRS) is in northern Utah, which looks a lot like Mars.

