

CAREER**● Geophysicist**

Bob Grimm is looking for water on Mars. Grimm is a geophysicist, a scientist who uses the science of physics to study Earth, its structure, and its atmosphere. Some geophysicists try to answer questions about the origin and history of Earth, while others use their knowledge of Earth to answer questions about other planets. One of those questions is whether there is water on Mars.

It isn't likely that humans will be living on Mars anytime soon, so why try to find water there? Bob Grimm explains the importance of his work this way: "The search for water on Mars really is the search for life. Are there microorganisms, algae, or other primitive life-forms beneath the surface? By finding liquid water, we will know where to look for life."

Probing Mars

Grimm isn't going to Mars in person. Instead, he and others are developing instruments to send to Mars to try to locate water beneath that planet's surface. These instruments work by reading patterns of electromagnetic waves reflected by formations beneath the surface. When electromagnetic waves hit something under the surface that conducts electricity, the pattern of the waves changes. By looking at the patterns in the waves as they are reflected back to the equipment, Grimm and others will be able to "see" what lies beneath Mars's surface. If there is underground water on Mars, it should show up as a change in the wave patterns.

Meanwhile, Back on Earth

The same procedures Grimm is using to find water on Mars can be used to locate objects, such as land mines, buried beneath the ground here on Earth. Standard metal detectors are useful, but they can't tell the difference between a mine and a piece of scrap metal. Along with electromagnetic pulses, Grimm uses imaging technologies similar to medical scanners to create images of objects buried beneath the ground. Once their location is pinpointed, mines can be safely removed or detonated.

An Interesting Career

Being a geophysicist has been rewarding for Grimm. "The sense of exploration really appeals to me," he explains. "It's like a hunt—I try to figure something out to bring some relationships together, and soon I have a story to tell!"

Think It Over

Think of ways to locate objects buried more than 2 m below the surface. Could you use sound, light, X rays, or something else? What problems would you have to solve to make a useful detector to send to Mars?