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Today was our first day in the field. Our group members went separate routes, but no matter which experiment we assisted with, we each learned something significant that we could use in the classroom environment.

We started the morning with breakfast and a lecture, during which we were briefed on the day's activities, and then we headed out to the field.

Tony and Stephanie went with Jim and Bill to explore caves with thermography, or readings of temperature variations. We know that Mars has caves from satellite data, but visually, cave openings are difficult to distinguish from shadows, meaning there may also be many hidden caves. One possible method for distinguishing them from the background is by using thermography, because, while a landscape generally radiates in the infrared (in other words, radiates the heat it has absorbed back into the atmosphere), a cave will radiate at a different temperature from solid ground. When thermal inspection of a landscape reveals spots of radically different temperature, they could indicate the mouths of caves. This technique for finding caves is as applicable to Mars as it is to the caves we looked at today.

In the field, we helped gather data. We took temperature measurements at the cave entrance over a period of time to determine the rate at which the temperature changed. We also measured wind speed and humidity. We then ventured a few hundred meters from the cave to examine it from a distance where the cave entrance was not obvious. Through the IR camera, the cave entrance stood out in blue, indicating it was much cooler than its surroundings, and including the shadows that it could have been mistaken for.





Pam went with Rakesh to perform chemical assays on desert soil samples. Normally such experiments are performed in the lab, but Rakesh hopes to develop workable field tests such as future Mars landers may perform. The tests use redox, (reduction and oxidation) reactions to test for evidence of life in the soil. If life does exist on Mars, it is likely to be in microbial form.



Lori, our final group member went with Elaine to collect soil samples from the transect. As happens sometimes in field work, their van got stuck in desert sand and they needed rescue. They did have a successful trip, having driven over a hundred miles in order to collect samples of soil from areas that receive very different levels of precipitation. These different soil samples will be analyzed to determine if different types of microbes are found using different amounts of water, and also whether these different microbes eat different substances. They also took the opportunity to go rock collecting.