

# Understanding Mars' Composition by Studying Earth

- Imaging spectroscopy from airplanes or satellites helps map different rock types on Earth and other planets, using reflected visible to shortwave infrared light. With this technique, each pixel in an image has a corresponding spectrum in hundreds of wavelengths with absorptions that are fingerprints, diagnostic of specific material compositions. Here, we demonstrate how imaging spectroscopy can be used at smaller scales, in the field, in the lab, and on future rover and lander missions.
- Took an imaging spectrometer to the Samail Ophiolite (Oman), which has many of the same water-formed minerals and rock types as detected from orbit in some locales on Mars.
- Determined imaging spectroscopy can differentiate between minerals that look similar from distance and use the spatial context of mineral detections to understand the time order of events affecting a rock.
- Using an imaging spectrometer to find small pieces of unaltered rock left intact after fluids have transformed most of the rock reveals the pressure, temperature, and chemical environment during rock formation and later alteration.

**Imaging spectroscopy provides critical evidence to understand minerals and their formation in the laboratory, the field, and from space.**

