My research interests are focused on the investigation of Mars using spacecraft instruments, and terrestrial studies emphasizing urban and desert environments. Both of these areas utilize remote sensing observations, and much of the research done by myself and my graduate students and post-docs focuses on laboratory, field, and theoretical studies of remote sensing. A great deal of my effort is focused on the development and operation of spacecraft instruments instrument for current and future planetary missions.

I am the Principal Investigator for the Thermal Emission Imaging System (THEMIS), a thermal IR and visible camera system, and the Thermal Emission Spectrometer (TES), both of which are currently orbiting Mars. I also developed the Mini-TES spectrometers, a pair of miniature TES instruments that are exploring Mars on the Spirit and Opportunity rovers. My research group at ASU is responsible for the development, operation, and data analysis of these investigations.

I currently have students working in the following areas: 1) the general study of the composition of martian surface materials, including volcanic rocks, carbonates and sulfates, weathering products, and hydrothermal systems. Mapping the distribution of rocks and minerals is providing insights into the history and evolution of the surface and climate of the planet; 2) the study of the atmosphere of Mars, including the development of dust storms and the distribution of water-ice clouds and vapor; 3) field and remote sensing investigations in Arizona, Oregon, Washington, and California studying aeolian processes, dune evolution, and soil development; 4) studies of urban development and long-term environmental monitoring; and 5) investigation of the spectral properties of minerals in the mid-IR. We have an operational emission spectroscopy lab and most of my students are actively involved in lab studies of minerals, sediments, rocks, etc, trying to relate these measurements to remotely acquired data. We are also developing radiative transfer models to do quantitative determinations of components in mixed spectra.

The program here at ASU is generally focused on geological sciences, but the new School of Earth and Space Exploration provides excellent opportunities for students interested in engineering as well as a developing expertise in atmospheric science. Students entering without a geoscience background are typically advised to take a core set of courses that might include mineralogy, petrology, structure, and a summer field camp. It is my personal opinion that a strong quantitative background, coupled with a good geoscience or atmospheric science background, provides the ideal training to address the most interesting planetary and terrestrial problems.

ASU has a very strong planetary program with a large group of faculty interested in a diverse set of planetary problems. I would encourage you to visit ASU in order to meet the faculty and get a first-hand look at the facilities that are available. If you can't visit in person, please feel free to get in touch with me by phone or e-mail (phil.christensen@asu.edu) to discuss ASU's program in more detail.

I hope this information has provided a better understanding of the program here at ASU. If you have any further questions, please contact me further.

Sincerely,

Phil Christensen
Professor