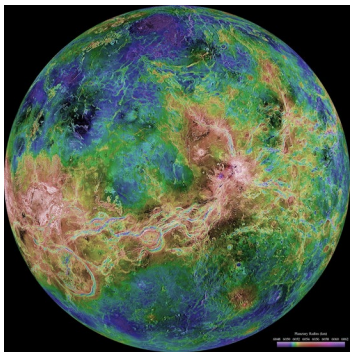
Stony Brook University

GEOLOGY OPEN NIGHT

UNDERSTANDING THE PLANET VENUS THROUGH UPCOMING MISSIONS

DR. LAURA BREITENFELD

Research Assistant Professor, Department of Geosciences



February 27, 7:30pm, Earth & Space Sciences 001

Three upcoming missions to Venus, VERITAS, EnVision, and DAVINCI, will investigate the planet's surface geology in the next decade. Past missions have revealed that Venus is similar to Earth in size and bulk composition but has an extreme surface environment, widespread volcanic plains, and a geologic history that remains poorly constrained due to limited compositional data. VERITAS and EnVision will provide global radar and spectroscopic observations to map surface morphology and composition, while DAVINCI will probe the atmosphere to better understand Venus's climate evolution. In particular, Venus orbital spectroscopy from the VERITAS mission will enable quantitative interpretation of surface geology by measuring emissivity variations related to rock composition. Achieving this requires detailed analysis of terrestrial analog samples, such as basalt and granite, to develop and calibrate spectral models that link laboratory measurements to orbital observations, ultimately allowing us to constrain the surface geology and geochemical evolution of the planet Venus.

Dr. Laura B. Breitenfeld is a Research Assistant Professor at Stony Brook University and an Associate Research Scientist at the Planetary Science Institute. Laura is a mineralogist and planetary scientist who utilizes vibrational spectroscopy techniques to characterize geologic materials on Earth and across the solar system. Her planetary science research includes remote sensing of Venus, Mars, the Moon, and asteroids as well as laboratory measurements of extraterrestrial samples and their analogs. Laura is motivated to answer fundamental mineralogy questions for a wide range of mineral groups by utilizing quantitative methods such as multivariate analysis. Her primary research goal is to understand the nature and distribution of hydrogen, oxygen, and carbon across our solar system.