



## 2015 DVP(\*) Departmental Seminar

UF Department of Chemistry

(\*) Distinguished Visiting Professor



### Dr. Roger Wiens

Space Remote Sensing Group  
Los Alamos National Laboratory  
and the University of New Mexico, USA

**FRIDAY, December 11, 2015**

**Location: Leigh Hall 207**

**Time: 4:00 pm (coffee and cookies at 3:50pm)**

### “ZAPPING ROCKS ON MARS WITH THE CHEMCAM LASER-INDUCED BREAKDOWN SPECTROSCOPY INSTRUMENT”

#### Abstract:

The Curiosity Mars rover uses laser-induced breakdown spectroscopy (LIBS) to probe rocks and soils up to 7 meters away, and provides the added advantage of removing ubiquitous dust and profiling several hundred microns into the rocks and through millimeters of soil. The ChemCam instrument also includes a Remote Micro-Imager (RMI) that provides the highest resolution remote images on the rover. Because of its long reach without requiring arm deployment, ChemCam has been used nearly every day since Curiosity landed in 2012. It discovered that Mars' most ancient igneous highland rocks resembled those of Earth's ancient continental crust, rich in feldspars but apparently poor in quartz. ChemCam also provided the first fine-scale soil studies on Mars, discovering ubiquitous hydration that is potentially important for human habitation. ChemCam has also explored the range of compositions of sedimentary rocks from ancient Gale Lake, finding calcium-sulfate and manganese-rich fracture fills, providing important clues to the chemistry and oxidation state of ancient groundwater in the area.



*Dr. Wiens started his scientific career by writing the first dissertation on the Mars atmosphere based on samples analyzed in the laboratory, from martian meteorites. He has worked as a scientist at Caltech, the University of California, and Los Alamos National Laboratory, and has made extended research visits to NASA's Johnson Space Center, Jet Propulsion Laboratory, the University of Bern, Switzerland, and Paul Sabatier University in Toulouse, France. Dr. Wiens was responsible for three instruments for NASA's Genesis mission and he acted in the capacity of Flight Payload Lead. This mission was the first to return to Earth from beyond the Moon, when it landed in 2004 with solar-wind samples that have revealed exciting details about the composition of the Sun.*

*Since 2004 Dr. Wiens has been the leader of the ChemCam laser instrument on the Curiosity rover (<http://mars.jpl.nasa.gov/msl/>; <http://www.msl-chemcam.com>) which landed in August, 2012. He has directed the US and French team operating ChemCam and interpreting the data returned from Mars. Dr. Wiens has been involved in other NASA robotic missions as well, including Stardust, Mars Odyssey, Lunar Prospector, and Deep Space-One, which include missions to the Moon, Mars, and two comets. In 2014 NASA selected the SuperCam instrument, a successor to ChemCam, to be built for its new Mars rover, scheduled to launch in 2020. Dr. Wiens is now leading this new instrument development.*