

## FALL 2016 CHEMISTRY COLLOQUIA, COSPONSORED BY NCMN



**October 14, 2016**

**3:00 p.m. Reception**

Rm 227 Hamilton Hall

**3:30 p.m. Seminar**

Rm 112 Hamilton Hall

**WASHBURN AWARD LECTURE**  
**Professor Richard J. Saykally**  
**University of California Berkeley and**  
**Lawrence Berkeley National Laboratory**

**Selective Adsorption of Ions to Aqueous Interfaces and its Effects on  
Evaporation Rates**

The behavior of ions at aqueous interfaces has been a subject of much controversy for decades. By exploiting the strong charge-transfer-to-solvent (CTTS) resonances of selected anions in aqueous electrolytes, their interfacial adsorption properties have been measured by deep UV-SHG spectroscopy. Temperature and concentration dependences are determined, with the goal of establishing a complete molecular description of selective ion adsorption via detailed theoretical modeling. A study of thiocyanate reveals that its strong adsorption to the air-water interface is enthalpically driven by hydration forces and impeded by a novel entropy effect (capillary wave suppression). Extension of this approach to the water-graphene interface reveals striking similarity to the air-water case. Development of a broadband deep UV SFG spectroscopy technique has produced detailed CTTS spectra of interfacial ions, for which comparisons with bulk CTTS spectra provide new insights. Evaporation rates measured by combining liquid microjet technology and Raman thermometry elucidate the relationship between surface propensities of ions and water evaporation rates. Detailed molecular mechanisms for both selective ion adsorption and aqueous evaporation are explored.

