Physical Chemistry Seminar

Tuesday, September 30, 2014 | **11:00 am** | **Room 1315 Chemistry Building**

Electrospray Photoelectron Spectroscopy: From Multiply Charged Anions to Ultracold Anions

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Host: Professor Etienne Garand

We first integrated an electrospray ionization source with photodetachment photoelectron spectroscopy, which has allowed any negatively charged ions present in solution to be investigated in the gas phase, including multiply charged anions, simple organic and inorganic anions to biological molecules. In this talk, I will briefly review our early effort in the studies of multiply charged anions using photoelectron spectroscopy, followed by our development of a cryogenic ion trap to create vibrationally cold anions. Cold anions are important to obtain high-resolution photoelectron spectra free of vibrational hot bands. I will also discuss our photoelectron imaging studies of multiply charged anions to probe the influence of intramolecular electrostatic effects on the photoemission angular distributions. Finally, I will discuss our very recent effort in high resolution photoelectron imaging of ultracold anions using a tunable laser, leading to the observations of dipole-bound excited states and vibrational autodetachment. I will discuss the potential to develop this experiment into a new method for vibrational spectroscopy of dipolar radicals. I will also present unexpected autodetachment dynamics via the dipole-bound states that result in excitations of forbidden molecular vibrations.

Refreshments will be available prior to the seminar at 10:45 a.m. outside room 1315

Graduate Students may meet with the speaker at 1:00 p.m. in Room 8305F