

# Seminar

8:30 a.m. Thursday, Dec. 1, 220 STSS

Post Doctoral Fellow

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## ***Glow Discharge Plasmas in Analytical Spectrochemistry: Not Just for Elemental Depth Profiling Anymore!***

### **Abstract**

Glow discharges are very versatile plasmas and their applications cover a wide range of topics from materials deposition and etching, to lamps and plasma display panels. The purpose of this presentation is to give an overview of selected recent advances in the use of glow discharges in analytical spectrochemistry where they have attracted increased interest because they allow fast elemental depth profiling with high depth resolution (nm).

After an introduction to glow discharge plasmas, a brief summary of glow discharge optical emission spectroscopy (GDOES) will be given. Then, several examples will show why GDs are no longer only for elemental depth profiling. Two method development studies in the area of materials for photovoltaics will show that GDOES can also serve to obtain refractive index information from transparent thin films and surface area information from nanostructured surfaces, which are very important to the performance of solar cell (and other) devices. In addition, an instrument development study will be described where a pulsed GD is coupled to a spectral imaging system thus allowing 3-dimensional elemental mapping from large areas. The newly available dimension of information will open the door to many applications as an example of the analysis of blotted proteins will show. Finally, the development of a GD source that operates at atmospheric pressure will demonstrate how the reactive species generated can be used for direct desorption/ionization from solids, liquids or gases. The resulting simple mass spectra can be easy to interpret and has proven advantageous in the field ambient ionization mass spectrometry.

The studies presented will demonstrate the current importance of GDs but also that they hold significant promise for the future of both elemental and molecular spectrometries.

**Host: Professors Christopher Cramer and Michael Bowser**  
**Refreshments will be served prior to the seminar.**