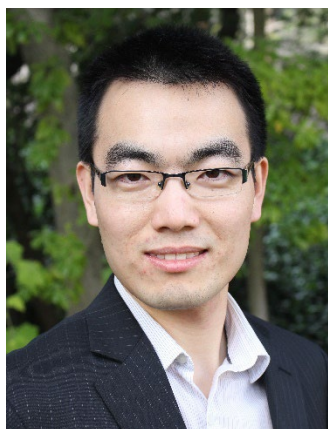




## **Analytical Chemistry Seminar**

**Tuesday, February 1, 2022  
3:30 PM, WTHR 320**

***“Molecular Imaging and Spectroscopy of Electrochemical  
Solid-Liquid Interfaces”***



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### **Abstract**

The interconversion between chemical energy and electricity relies critically on electrode-electrolyte interfaces, which consists of the electrode surface regions and the solvation layers, also called the electric double layers (EDLs). While the electrode morphology and composition have been extensively studied using in-situ characterization techniques, to date the structure of EDLs remains largely elusive. I will discuss our recent efforts on in situ imaging and spectroscopy of electrode-electrolyte interfaces at the molecular level, for a large range of liquid electrolytes including ionic liquids, aqueous solutions, and organic electrolytes. In particular, we have developed a novel technique, electrochemical three-dimensional atomic force microscopy (EC-3D-AFM), to directly image both the electrode surface and EDLs with atomic-scale resolution. We also use surface-sensitive Raman spectroscopy to probe the chemical bonding states of these interfaces. We observe rich EDL reconfiguration effects on crystalline and atomically heterogeneous electrode surfaces.