

**UNIVERSITY OF RHODE ISLAND**  
**Department of Chemistry**  
**SEMINAR**

**Room 105 Beupre Center**  
**2:00 p.m, Monday March 8, 2019**

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***College of the Holy Cross***

***“Molecular Interactions in Multi-component  
Self-Assembled Monolayers as Investigated by  
Scanning Tunneling Microscopy and X-ray  
Photoelectron Spectroscopy”***

**HOST**

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## **Molecular Interactions in Multi-component Self-Assembled Monolayers as Investigated by Scanning Tunneling Microscopy and X-ray Photoelectron Spectroscopy**

### **Abstract**

The everyday world does not exist in isolated compartments, but in mixtures. From contaminants to naturally occurring blends, chemical compounds are, more often than not, found intermingled with a multitude of other compounds. Furthermore, the existence of our world in non-vacuum conditions and the resulting exposure of a surface to over a mole of particles at standard temperature and pressure conditions introduces an entirely new set of variables that can alter the surface structures of compounds. Add to this the fact that the majority of chemical processes occur at interfaces and you have created a surface scientist's dilemma: how is the monolayer structure and functionality of a compound impacted by its presence in a mixture in ambient conditions? Multi-component self-assembled monolayers of aromatic and aliphatic organothiols offer a wealth of information for the mechanism of intermolecular interactions on surfaces. Thus far we have carried out the characterization of binary monolayers consisting of biphenyl-4-thiol or 2-naphthalenethiol and octanethiol using Scanning Tunneling Microscopy and X-Ray Photoelectron Spectroscopy. Our research program aims to create a library of mixed monolayer systems of compounds within these families. By creating such a library, we will be able to identify common trends that guide the formation of heterogeneous surface structures.