

***UNIVERSITY OF RHODE ISLAND***

***Department of Chemistry***

***SEMINAR***

***Room 234 Pastore Hall***

***2:00 P.M, Friday, November 20, 2015***

***Julie Whelan***

***University of Rhode Island***

***Kingston, RI***

***“Molecular-Level Design of Nanoscale  
Tools for Enhanced Single Molecule  
Sensing”***

***Host***

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## **Molecular-Level Design of Nanoscale Tools for Enhanced Single Molecule Sensing**

Single molecule studies depend upon precise control over the chemical and physical structure of the nanoscale sensing instrumentation and environment, and this demand is particularly stringent in the case of nanopores, a unique tool for single-molecule sensing and manipulation. The size and shape of the nanopores are critical to their function, and each facet, alone, presents experimental hurdles; this work contains an approach to address both, simultaneously. A method for electroless deposition of gold onto solid-state silicon nitride nanopores provides a foundation for precision tailoring of surface properties and nanopore size to study single analyte molecules and their interactions with other molecules of interest. This work has developed a set of tools to directly modify the surface of silicon nitride, and through this approach, to customize the nanopore size and surface properties for various molecular systems under investigation.