

Probing Structure-Function Relationships Using Single Molecule Measurements

As matter is confined to the nanometer scale, unusual phenomena arise. The ~ 1 nm regime is where physics meets chemistry—materials approach atomic dimensions and can no longer be described by bulk properties. In order to understand and create devices on these lengths scales, we must learn to probe the atomic structure of a single molecule system while simultaneously measuring its function in ambient conditions.

In this talk, I will first describe how we study electron transport properties of metal-molecule-metal junctions as a function of junction geometry. We find that the atomic structure of the metal-molecule interface determines transport properties at both cryogenic and room temperatures. I will demonstrate the varying effects of geometry on conductance in diamine, pyridine and metallocene molecular junctions.

Finally, I will present our recent progress towards measuring the absorption spectrum of single molecules using a force-based approach in an optical tweezer setup and outline future plans for single molecule experiments on this system.

**Department of Physics
University of Vermont**

**Theoretical and
Applied Physics**

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4:00 PM

Davis Center, Mildred Livak

Room 419

Refreshments will be available at

3:30 PM.

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