

# Physics Colloquium

Michigan Technological University

Thursday, April 7, 2011 at 4:00 pm

Room 139 Fisher Hall



## Electronic Transport in Single Molecular Junctions Bingqian Xu

University of Georgia

**Abstract:** Molecular electronics, where single molecules are used as devices - molecular wires, rectifiers and transistors - is a topic of considerable interest at present. Although substantial efforts are being made to bring the ideas of molecular devices into reality, this field is still somewhat futuristic and need further experimental and theoretical investigation. Future experimental techniques that can fabricate molecular junction devices with molecule electrode contacts that are well defined on the atomic scale and that can characterize the atomic-scale structures of the molecule-electrode contacts with more efficient and more precise control of electron transport will contribute enormously to the field of molecular electronics. We will describe highly integrated and effective methods to simultaneously fabricate, control and modulate, and monitor the electronic and mechanical properties of molecular junction devices at the singlemolecule level. The simultaneity will minimize variations normally occur in individualized approaches and thus offer more detailed information and greater understanding of molecular junctions and of processes. Various molecule systems will be discussed.

**Biography:** Bingqian Xu is an Associate Professor of Biological Engineering and Adjunct Professor of Chemistry in The University of Georgia (UGA). He received his Ph. D. in Materials Science and Engineering at Arizona State University (ASU) in 2004 and worked as a Faculty Research Associate in ASU until he came to UGA in 2006. His BS degree in Physics and Geography was offered by Northwestern University, Xian, China. He taught Quantum Physics in China until he came to the US in 2000. His main research interests are in molecular nanoelectronics, nanobiotechnology and single molecule techniques and pioneers in SPM-based single molecule study techniques. He published more than 40 research papers in journals of Science, PNAS, JACS, Nano letters, Small, Angew Chem., etc. He is a member of American Physical Society, American Chemical Society and Materials Research Society.

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