



UNIVERSITY OF CENTRAL FLORIDA

NANO SCIENCE TECHNOLOGY CENTER  
ADVANCED MATERIALS PROCESSING & ANALYSIS CENTER

## GRADUATE RESEARCH SEMINAR SERIES

Friday  
March 20, 2015

12:30 PM – 1:00 PM

Research Pavilion  
NSTC  
Conference Room 475

*Pizza and drinks  
will be provided*

### **New Atomic Force Microscopy Techniques Based on Mechanical Actuation of the Cantilever Tip and the Sample**

**Mikhael Soliman (12:30 PM - 1:00 PM)**  
**Dr. Laurene Tetard's Group**

Recent advances in nanotechnology call for the development and perfection of new and reliable characterization techniques, which can probe materials at the nanoscale with minimal disturbance in their structural and compositional integrity. Since its invention, scanning probe microscopy has continually shown unlimited potential and exceptional versatility in terms of studying the various properties of materials at the nanoscale, and the atomic force microscope continues to be at the forefront of developing new nanoscale characterization methods. Multi-Frequency Atomic Force Microscopy, such as Mode Synthesizing Atomic Force Microscopy (MSAFM), in which the tip and/or the sample are subjected to mechanical actuations, is emerging as a versatile platform for soft matter studies. However, the complexity of the tip-sample dynamics requires a comprehensive calibration and modeling of the system to reach quantitative analysis. Here we will present the first time study of a block copolymer thin film sample and discuss how different configurations affect the resolution and sensitivity of the image. Furthermore, the power of the technique will be demonstrated in resolving the ultrastructure of plant cell walls, as an example for new exciting applications in studying biomaterials at the nanoscale .

