Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Development of Molecular Beam Epitaxy/Pulsed Laser Deposition/Low Temperature Spin-Polarized Scanning Tunneling Microscopy System[1] JEONGIHM PAK, WENZHI LIN, KANGKANG WANG, ANDREW FOLEY, TIANJIAO CHEN, YINGHAO LIU, ABHIJIT CHINCHORE, DANIEL BERGMAN, MENG SHI, ARTHUR R. SMITH, Ohio University Nanoscale and Quantum Phenomena Institute — Spin-polarized scanning tunneling microscopy and spectroscopy have shown tremendous abilities to obtain detailed spin information about surfaces down to the atomic scale. In order to take full advantage of this method for studying pristine, as-prepared sample surfaces, we couple an SP-STM system to a sophisticated ultra-high-vacuum growth facility. The hybrid molecular beam epitaxy/pulsed laser deposition/spin-polarized STM system is home-designed and constructed with many unique features. A wide variety of engineered spintronic materials can be grown in the 8 source growth chamber, or using the 9 source laser deposition system. Samples may be heated during growth to as high as 1300 K or cooled using LN2 to temperatures below 195 K, while being simultaneously probed using reflection high energy electron diffraction. The system is currently configured for nitride systems as well as transition metal or rare earth ultra-thin films. Prepared samples are transferred through a central distribution chamber to the LHe-cooled, spin-polarized STM operating inside an integral superconducting magnet (0-4.5 T). The system is outfitted with magnetic tip preparation. The magnetic field allows us to manipulate the magnetic structure of samples during SP-STM experiments.

[1]National Science Foundation and Department of Energy

Arthur R. Smith
Ohio University Nanoscale and Quantum Phenomena Institute

Date submitted: 11 Nov 2011 Electronic form version 1.4