

Computational and Applied Mathematics Seminar

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**Wednesday, February 15, 2012
10:00a.m., HH-3017**

***“NEW PARADIGMS IN MAGNETIC RECORDING: UNDERSTANDING
THROUGH MICROMAGNETIC MODELING.”***

Abstract:

The rapid growth in areal density which has driven the magnetic recording industry over the past 40 years is facing fundamental physical limitations. Superparamagnetism is largely responsible for the reduction in disc-drive warranty periods that has occurred in recent years. New types of recording systems continue to be introduced and evaluated in an effort to increase the number of bits on a disc. Perpendicular recording along with Tunneling Magneto-Resistive sensors introduced recently ensure continued near-term improvements in storage-based consumer electronics. Evaluation of exotic ideas such as heat-assisted recording and bit-patterned media are ongoing. Fundamental to all these types of recording paradigms is magnetic interactions on a nanometer length scale. Computational micromagnetic modeling is a powerful tool that can be used to evaluate new concepts as well as provide guidance for production-ready designs. Several examples of how computer modeling contributes to our understanding of fundamental magnetic processes relevant to thin film storage technology are presented.