Physics Colloquium

Exploring the local behavior of magnetic nanomaterials via Lorentz TEM

WEDNESDAY

FEBRUARY 3

4:00 P.M.

RM 118 NSH

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As the dimensions of magnetic materials decrease to the nanoscale, novel distributions of spin can be created. We are exploring the formation of these novel distributions and ways to control them through gaining an understanding of the local energy landscape of the nanostructures. We use a combination of Lorentz TEM and in-situ magnetizing experiments, together with magnetic force microscopy (MFM), to study the micromagnetic behavior at the sub-micron scale in magnetic nanostructures such as heterostructures composed of coupled, patterned magnetic disks, and artificial spin ice arrays consisting of arrays of nanoscale magnetic elements. Quantitative analysis of the Lorentz TEM data has been carried out using the transport of intensity equation (TIE) approach, which we have extended to allow us to visualize the magnetic structure in three dimensions. By comparing these data with the results of simulations, we are able to gain a fuller understanding of the various energy terms that contribute to the behavior that we observe.

Refreshments
in Rm 202 NSH
@ 3:30 pm