Abstract Submitted
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Magnetic Properties of Nanostructures[1] JOHN CIRALDO, Ohio State University, EZEKIEL JOHNSTON-HALPERIN TEAM — The recent development of the superlattice nanowire pattern transfer (SNAP) technique has enabled the fabrication of complex molecular-electronic circuits at unprecedented densities. In this project, we explore the possibility of extending this technique to generate comparably dense arrays of nanoscale giant magnetoresistive (GMR) and tunneling magnetoresistive (TMR) devices. My primary contribution to this project has focused on using a vibrating sample magnetometer (VSM), as well as a superconducting interference device (SQUID) magnetometer to monitor the magnetic properties of the devices as they are processed from thin 2D films into nanostructure arrays. This investigation allows us to investigate both fundamental and technological aspects of the nanopatterning process. For example, the effects of changing surface to volume ratios on the ferromagnetic exchange interaction and the role of various patterning techniques in determining surface chemistry and oxidation of the final nanostructures, respectively. Additionally I have worked on simulations of the materials using NIST's OOMF program, allowing me to compare actual results with theoretical expectations. I am also designing a magneto-optical Kerr effect (MOKE) detector, which will allow faster approximations of magnetic behavior.

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John Ciraldo
Ohio State University

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