MAR13-2012-020039

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

Magnetic Nanostructures by Templated Self Assembly

CAROLINE ROSS, Massachusetts Institute of Technology

Self assembly techniques provide a route to the rapid synthesis of nanostructures whose long range order and registration can be controlled by pre-patterning the substrate lithographically. This presentation will focus on two processes. First, masks made from templated block copolymer films are used for patterning of metallic magnetic films and multilayers into arrays of lines or dots with feature sizes of 10 nm and above. Second, codeposition of spinel and perovskite oxide phases leads to epitaxial thin film nanocomposites in which ferrimagnetic cobalt ferrite pillars are embedded in a ferroelectric bismuth orthoferrite matrix. The pillars form a regular array when templated by pits of pitch 60 nm and above, and have a strong magnetoelastic anisotropy. Magnetic properties of the resulting nanostructured materials are described.