MAR07-2006-000423

Abstract for an Invited Paper
for the MAR07 Meeting of
the American Physical Society

Opportunities in Nanomagnetism[1]

SAMUEL D. BADER, Argonne National Laboratory

This talk addresses the challenges and scientific problems in the emerging area of nanomagnetism. [1] Included are fabrication strategies, and experiments that explore new spin-related behavior in metallic systems, as well as efforts to understand the observed phenomena. As a subfield of nanoscience, nanomagnetism shares many of the same basic organizing principles, such as geometric confinement, physical proximity, and chemical self-organization. These principles are illustrated by means of examples drawn from the quests for ultra-strong permanent magnets, ultra-high-density magnetic recording media, and nanobiomagnetic sensing strategies. As a final example showing the synergetic relationship to other fields of science, the manipulation of viruses to fabricate magnetic nanoparticles is presented.

[1] S. D. Bader, Rev. Mod. Phys. 78, 1 (2006).

[1]Work supported by the U.S. Department of Energy under contract #DE-AC02-06CH11357.