

Physikalisches Kolloquium

Thursday, 12.06.14, 17:15, HS 100
Reception with coffee & cookies 16:45



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Phase stabilities in alloy nanoparticles

Abstract

Due to their nanoscopic size, the surface-to-volume ratio of nanoparticulate materials is significantly enhanced over that of their bulk counterparts. Consequently, large fractions of the atoms “feel” the symmetry breaking of these surfaces, and the surface (free) energies contribute significantly to the total energy balance of nanoparticles. In alloy nanoparticles, differences in the surface energies of their constituents may even promote the segregation of elements with low surface energies toward the particle surfaces. As a consequence, materials, which are known to form homogeneous alloys in the bulk, may exhibit tendencies to segregate at small length scales. The talk will review segregation phenomena in alloy nanoparticles with a special focus on FePt nanomagnets. Particular attention will be paid to the near-surface lattice relaxation as determined through aberration-corrected high resolution transmission electron microscopy in combination with Molecular Dynamics simulations.

References:

D. Pohl et al., Phys. Rev. Lett. 107 (2011) 185501.

B. Bieniek et al., J. Nanoparticle Res. 13 (2011) 5935.

D. Pohl et al., Nano Lett. 14 (2014) 1776.

All of you interested in physics are cordially invited!

