TECHNISCHE UNIVERSITÄT CHEMNITZ

PHYSIKALISCHES KOLLOQUIUM

Mittwoch, 04.12.2013, um **17:15 Uhr**

Ort: Reichenhainer Str. 90; Neues Hörsaalgebäude, Raum: 2/N013

Dr.Volker Neu

IFW Dresden

Epitaxial Sm-Co thin films and multilayers: magnetism and more

Thin magnetic films are inevitable in today's technological society and due to the continuing discoveries of new magnetic phenomena and materials they remain a fascinating research topic. Crystallographically well defined epitaxial growth of such films is of special interest when magnetic phases with anisotropic magnetic properties are studied.

Epitaxial SmCo5 films build on the outstanding intrinsic anisotropic magnetic properties of the known hard magnetic bulk phase, especially the large uniaxial magnetocrystalline anisotropy, and they combine it with a nanocrystalline microstructure, which favorably influences the magnetic coercivity by introducing a dense network of pinning sites. This is reflected in the small size of (interaction) domains observed by magnetic force microscopy and in the large resistance against demagnetization, which leads to large coercivities μ0Hc and energy densities (BH)max – both decisive quantities for permanent magnet applications.

Utilizing epitaxial growth conditions and the full size control in the 3rd dimension we are able to prepare novel fully textured and vertically exchange coupled hard/soft magnetic SmCo5/Fe multilayers, which combine the excellent coercivity of SmCo5 with the high saturation polarization of Fe to obtain hard magnetic thin films with unprecedented energy densities above 450 kJ/m3. I will discuss microstructural and magnetic properties of such exchange coupled multilayers and will derive a quantitative understanding of their behavior by means of 3-dimensional micromagnetic modeling.

Alle Zuhörer sind ab 17:00 Uhr zum Kaffee vor dem Hörsaal eingeladen.

Informationen zum Vortrag erteilt Dr. Sebastian Fähler, Tel.: 0371 531 33761