

Physikalisches Kolloquium

15.12.08

16:15 Uhr

Hörsaal H2

Dr. Rafal Dunin-Borkowski (Technical University of Denmark, Kongens Lyngby)

“Advanced transmission electron microscopy of nanoscale materials and devices”

Abstract:

The Center for Electron Nanoscopy in the Technical University of Denmark, which was inaugurated in December 2007, contains seven new electron microscopes including two aberration-corrected Titan TEMs. I will begin with a brief description of the facility. I will then present a selection of recent results that illustrate how modern transmission electron microscopy techniques can be used to provide quantitative information about the properties of nanoscale materials and devices.

I will concentrate on off-axis electron holography for measuring magnetic and electric fields in materials. The technique is applied to materials systems that include ferromagnetic nanoparticles and semiconductor devices examined as a function of applied voltage in situ in the electron microscope. If time permits, I will also describe results obtained by applying electron tomography to characterize the microstructure and chemistry of materials in three dimensions, aberration-corrected imaging combined with focal series restoration to characterize active sites on the surfaces of catalyst nanoparticles, and in situ transmission electron microscopy to observe nanoparticle sintering in a gas reaction environment.