



NanoSpin Group
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Post-Doctoral Position in Advanced Transmission Electron Microscopy of Functional Oxide Multilayers

Hybrid multilayer oxides comprising magnetic and ferroelectric thin films hold a great promise for device applications as they facilitate active control over magnetic properties such as moment, anisotropy, and permeability by the application of an electric field and tuning of electrical polarization and permittivity by an external magnetic field. In the Nanomagnetism and Spintronics Group of the Department of Applied Physics at Aalto University (former Helsinki University of Technology) we are studying magnetoelectric phenomena in epitaxial oxide multilayers with coexisting magnetic and ferroelectric order. In this project, strain-mediated coupling at magnetic/ferroelectric interfaces will be studied and quantified using advanced transmission electron microscopy techniques including aberration-corrected HR-TEM, aberration-corrected STEM, electron-energy loss spectroscopy (EELS) and energy-filtered TEM.

The work will be conducted in the Nanomicroscopy Center at Aalto University. This center, which was opened in 2009, is one of the largest microscopy clusters in Europe. The infrastructure consists of various high-resolution microscopes for soft, hard and biomaterial characterization. The successful candidate will work with a state-of-the-art JEOL JEM-2200FS double Cs corrected TEM. This instrument combines a 200 kV field emission gun (FEG) and an in-column energy filter to produce a high-end, optimally configured TEM for energy filtered imagery. It also utilizes a new, rotation-free image-forming optical system which not only facilitates acquisition of TEM images and diffraction patterns but also produces stable spectral data. Cs-correction at the probe and image provides a specified spatial resolution of $d < 0.12$ nm in TEM mode and $d < 0.10$ nm in STEM mode.

Applicants should have a Ph.D. in physics, material science, chemistry or a related discipline and at least four years hands-on experience in advanced TEM techniques and cross-sectional sample preparation. Proficiency in the use of Cs correction is highly desired and experience with focused-ion beam (FIB) sample preparation is appreciated.

The contract can start immediately and the appointment can run up to three years. After a successful post-doctoral period, there is a possibility to apply for a tenure-track position at the Department of Applied Physics. The yearly gross salary amounts to about 40 kEUR.

Applications, including CV, statement of interest, and contact details of three references should be sent by mail or e-mail to Prof. Sebastiaan van Dijken, Nanotalo, Puumiehenkuja 2, P.O. Box 15100, FI-00076 Aalto, Finland. E-mail: sebastiaan.van.dijken@hut.fi