# MA 30: Magnetic instrumentation and characterization

Time: Wednesday 10:45–11:45 Location: H53

MA 30.1 Wed 10:45 H53

**Bambus: a new inelastic neutron multiplexed analyzer for Panda at MLZ** — •A. Bertin[1], P. Cermák[2], J. A. Lim[1], I. Radelytskyi[2], A. Schneidewind[2], and D. S. Inosov[1] — [1]Institut für Festörperphysik, TU Dresden, Dresden, DE — [2]Forschungszentrum Jülich GmbH, Outstation at MLZ, Garching,DE

Cold-neutron triple-axis spectrometers (TAS) are dedicated to the investigation of low-energy excitations in a wide area of condensed matter physics, from quantum magnetism to unconventional superconductors. This technique allows us to measure individual points in the large $(\mathbf{Q}, E)$ space for one instrument setting, in particular at very low temperatures and high magnetic fields. New engineering solutions were recently developed in order to increase the useful signal on TAS. With this purpose, the multianalyser Bambus is being constructed at the cold-neutron triple-axis spectrometer Panda at MLZ, in cooperation with TU Dresden, and financial support from the BMBF project 05K16OD2. Its concept lies in collecting data at a certain energy transfers along a curved path in $\mathbf{Q}$ space, with the aim to construct broad reciprocal space maps at multiple energy transfers in a reliable, easy-to-use setup without movable axes. Hence, experiments will provide an overview in a large $(\mathbf{Q}, E)$ space, in order to get insights of broad features at low energy or study complex dispersion laws. Because this spectrometer is designed as a complementary option to the normal TAS mode, a fast switch between the two setups is foreseen. The general concept will be presented together with the final design, the different key components, and the results obtained with two prototypes.

MA 30.2 Wed 11:00 H53

**SQUID Setup for the Measurement of Antiferromagnets and other Magnetically Weak Samples** — Michael Paulsen[1], Jörn Beyer[1], Michael Fechner[2], Klaus Kiefer[3], •Bastian Klemke[3], and Dennis Meier[4] — [1]Physikalisch-Technische Bundesanstalt, Berlin, Germany — [2]Max Planck Institute for the Structure and Dynamics of Matter, CFEL, Hamburg, Germany — [3]Helmholtz-Zentrum Berlin, Berlin, Germany — [4]Norwegian University of Science and Technology, Trondheim, Norway

Antiferromagnets have been studied for several decades in fundamental research and, more recently, as materials of interest in spintronic devices. While these materials typically possess zero net magnetization, predictions of a permanent magnetization of higher order have been made but very few confirmed measurements exist. In this presentation, the development of a SQUID setup for the measurement of antiferromagnets and other weakly magnetic samples is presented. The initial measurements demonstrate that the setup is especially well suited for measuring weak quadrupolar magnetic fields in magnetically shielded rooms.

MA 30.3 Wed 11:15 H53

**Quantitative measurements of magnetic states in patterned permalloy disks using off-axis electron holography and model-based reconstruction of magnetisation** — •Teresa Wessels[1], Simone Finizio[2], Patrick Diehle[1], Jan Caron[1], Andras Kovacs[1], Vadim Migunov[1,3], Jörg Raabe[2], and Rafal Dunin-Borkowski[1] — [1]Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons and Peter Grünberg Institute, Forschungszentrum Jülich, 52425 Jülich, Germany — [2]Swiss Light Source, Paul Scherrer Institute, 5232 Villigen, Switzerland — [3]Central Facility for Electron Microscopy (GFE) RWTH Aachen University, 52074 Aachen, Germany

The ability to image magnetic states in sub-micron-sized structures is of increasing importance for new emerging technologies. Here, we investigate intrinsic magnetisation states in permalloy disks using off-axis electron holography in an aberration transmission electron microscope. The disks were deposited onto electron-transparent SiN windows with diameters of 750 to 1500 nm and thicknesses of 50 to 200 nm. Magnetic induction maps were determined from the recorded off-axis electron holograms and used to show that the disks contained magnetic vortices at remanence. The projected in-plane magnetisation in each disk was reconstructed quantitatively using a model-based iterative reconstruction algorithm. A cross-sectional analysis of the disks revealed that they had slightly distorted bowl-like shapes. The relationship between the disk shapes and the three-dimensional nature of the resulting magnetic states will be discussed.

MA 30.4 Wed 11:30 H53

**Bringing Neutrons to the User - The Jülich HBS Project for accelerator based neutron sources** — •Thomas Gutberlet[1], Ulrich Rücker[1], Paul Zakalek[1], Eric Mauerhofer[1], Tobias Cronert[1], Johannes Baggemann[1], Paul Doege[1], Marius Rimmler[1,3], Sarah Böhm[2], Jingjing Li[1,4], and Thomas Brückel[1] — [1]Forschungszentrum Jülich GmbH, JCNS, Germany — [2]RWTH Aachen, Germany — [3]Forschungszentrum Jülich GmbH, IKP-4, Germany — [4]Forschungszentrum Jülich GmbH, IEK-6, Germany

Neutron scattering has proven to be one of the most powerful methods for studying structure and dynamics of condensed matter on atomic length and time scales. In particular, neutrons are an essential tool to study and understand magnetic phenomena. Accelerator driven neutron sources with high brilliance neutron provision are an attractive option to provide scientist with neutrons for their research. The Jülich Centre for Neutron Science is developing a compact accelerator driven pulsed neutron source to offer access to science and industry to neutrons as medium-flux, but high-brilliance neutron facility. The "High-Brilliance Neutron Source (HBS)" will consist of a high current proton accelerator, compact neutron production and moderator system and optimized neutron transport system for thermal and cold neutrons. The project will allow construction of a scalable neutron source ranging from a university based neutron laboratory to a full user facility with open access and service. We will describe the currents status of the project, the next steps, milestones and the vision for the future use of neutrons at universities and research institutes.