Symposium Synergistic Imaging Techniques: From Spins and Atoms to Ferroic Domains (SYSA)

jointly organized by
the Crystalline Solids and their Microstructure Division (KFM),
the Metal and Material Physics Division (MM),
the Surface Science Division (O), and
the Magnetism Division (MA)

Felix Büttner
University of Augsburg
Institute of Physics
Universitätsstraße 1
86159 Augsburg
felix.buettner@physik.uni-augsburg.de

Jan Schultheiß
NTNU
Faculty of Natural Sciences
Kjemi 1
208 Gløshaugen
jan.schultheiss@ntnu.no

Anna Grünebohm
Ruhr-Universität Bochum
Interdisciplinary Centre for Advanced Materials Simulation
Universitätsstraße 150
44801 Bochum
anna.gruenebohm@rub.de

Several notable features have emerged in the study of ferroic materials, including skyrmions, topologically protected vortices, and multiferroic domain walls. These advancements can be attributed to the continuous improvement of imaging techniques, which allow for the visualization of spatially resolved properties instead of solely relying on the macroscopic ferroic behavior averaged over a large scale. By applying these techniques in a synergistic manner, we can now gain a better understanding of the physical phenomena occurring across multiple length scales, ranging from the overall ferroic order to the behavior of individual atoms. This not only advances the fundamental understanding of ferroic materials but also creates vast opportunities for related fields, including thin films, magnetism, or superconductivity. These fields inherently involve physical behaviors that arise from multiple length scales. This symposium aims to introduce imaging techniques that bridge these length scales, with a particular focus on ferroic materials. The ultimate vision is to explore the synergistic capabilities among these techniques, opening new avenues of research and discovery.

Overview of Invited Talks and Sessions

(Lecture hall H 0105)

Invited Talks

SYSA 1.1	Mon	15:00–15:30	H 0105	**Imaging with coherent soft X-rays** — •Bastian Pfau
SYSA 1.2	Mon	15:30–16:00	H 0105	**Exploring ferroelectric domains and domain wall dynamics with quantitative STEM** — •Marta D. Rossell
SYSA 1.3	Mon	16:00–16:30	H 0105	**Scanning Oscillator Piezoresponse Microscopy: new tools to explore domain wall dynamics** — •Neus Domingo, Shiva Raghuraman, Ralph Bulanadi, Patrycja Paruch, Stephen Jesse
SYSA 1.4	Mon	16:45–17:15	H 0105	**Imaging probe nuclei environments using perturbed angular correlation spectroscopy: Examples from multiferroic $BiFeO_3$** — •Doru C. Lupascu, Thien Thanh Dang, Georg Marschick, Marianela Escobar, Astita Dubey, Ian Yap Chang Jie, Juliana Heiniger-Schell
SYSA 1.5	Mon	17:15–17:45	H 0105	**Exploring antiferromagnetic order at the nanoscale with a single spin microscope** — •Vincent Jacques, Aurore Finco

Sessions

SYSA 1.1–1.5	Mon	15:00–17:45	H 0105	**Synergistic Imaging Techniques: From Spins and Atoms to Ferroic Domains**