

MSE 2024

24 - 26 Sep 2024 (Darmstadt)
dgm.de

Topic C: Characterization

C09: Multiscale Materials Characterization through 3D Diffraction Microstructure Imaging

Materials science drives innovation in modern society, necessitating advanced tools for comprehensive understanding. The hierarchical arrangement of structures, from atomic defects to grains, profoundly influences material properties. Traditional electron microscopy, though offering atomic-scale resolution, falls short of capturing dynamic processes and multi-scale structures within bulk materials. In response, x-ray and neutron-based diffraction-contrast imaging techniques have emerged as potent instruments for 3D multiscale material exploration, enabling in-situ and in-operando experiments. This symposium spotlights these cutting-edge techniques with two clear goals: (i) Advancing Diffraction-Based Imaging: Explore innovative approaches and applications for characterizing materials, structures, and properties. Dive into complex materials science characterization challenges through presentations and discussions. (ii) Exploring Collaborative Opportunities: Foster interaction among researchers using diverse synchrotron, neutron and lab-based diffraction-contrast imaging methods, emphasizing synergies. Discuss collective advancements in sample environments, data analysis platforms, and instrumentation.

Topics of interest include but are not limited to:

- Applications in Cutting-Edge Materials Research: Showcasing diffraction-based characterization contributions to research on novel materials, composites, and functional materials.
- Instrumentation and Methodological Developments: Highlighting advancements in instrumentation, data acquisition, and analysis methods.
- Sample Environment Innovations: Investigating integration with novel sample environments, such as in-situ and in-operando setups.
- Data Analysis and Computational Approaches: Presenting efficient data analysis strategies, visualization, and integration of computational simulations with experimental data.
- Cross-Technique Synergies: Identifying opportunities for collaboration and knowledge transfer among imaging methods.

By hosting this symposium, we aim to nurture the 3D diffraction-contrast imaging community's growth and drive continued advancements in materials-centered research. Our collaborative efforts strive to find innovative, sustainable solutions for contemporary societal challenges.

Symposium Organizer



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