Details

Core Facility for Microscopy and Materials Analysis (CMMA)

The Core Facility for Microscopy and Materials Analysis (CMMA) combines the essential infrastructure for characterising materials using electron and ion microscopy and the associated spectroscopic methods and in-situ testing technology. Two scanning electron microscopes (SEM), a focused ion beam system (FIB) and a dual-beam system (SEM-FIB combination) are available for this purpose. All scanning electron microscopes have the capability of elemental analysis using energy-dispersive X-ray spectroscopy (EDS). It is also possible to perform elemental analyses using wavelength-dispersive X-ray spectroscopy (WDS). EBSD measurements (backscattered electron diffraction) can also be performed to determine orientation relationships, phase analyses and quantitative microstructure assessments. To determine mechanical characteristics, the CMMA has an in-situ tensile-compression module with a load capacity of up to 5 kN. In-situ experiments can also be performed using a heating stage. Each of the available devices is located in its own laboratory with corresponding operator and preparation workstations for sample preparation. In a separate preparation laboratory, it is possible to carry out more extensive preparations (rough and fine cutting, metallographic preparation), the production of sample holders or surface modifications by sputtering and vapour deposition with various metals.

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Host Institution

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Scientific Domain

Primary Subjects:
- Mechanical and Industrial Engineering
- Materials Science and Engineering

Secondary Subjects:
- Medicine
- Thermal Engineering/Process Engineering
- Computer Science, Electrical and System Engineering

Category

Analytical Facilities

Scientific Services

The Core Facility for Microscopy and Materials Analysis (CMMA) at Otto-von-Guericke-University Magdeburg combines the essential infrastructure for the characterization of materials using electron and ion microscopy as well as the associated spectroscopic methods and possibilities of in-situ testing technology. Furthermore, selected methods of qualitative and quantitative element analysis are bundled here. The aim of the CMMA is to offer internal and external users an efficient infrastructure and a platform for scientific and technological exchange in the area of imaging, materials analysis and the production of structures at the micro-nano scale. It is also integrated into university training and education programmes. The approach is to accompany research projects from the idea, via preparation, right through to imaging, analysis or the measured characteristic parameters. Users are provided with expert advice, equipment training, assistance and full-service offers at every stage. The Core Facility for Microscopy

and Materials Analysis (CMMA) offers state-of-the-art equipment and methods for imaging of materials using electron and ion microscopy as well as selected methods of solid-state analysis. In addition, the Core Facility has access to the main preparation methods for achieving optimum analysis results.

Scientific Equipment

- DualBeam FEI Scios
- Field Emission SEM FEI XL30
- LaB6 SEM Zeiss Evo 15
- Focused Ion Beam FEI Strata
- Energy-dispersive X-ray spectroscopy (EDS)
- Sputter coater Quorum Q150T ES
- Sputter coater Emitech K550
- Wavelength-dispersive X-ray spectroscopy (WDS)
- Electron backscatter diffraction (EBSD)
- in-situ heating stage
- in-situ tensile testing module
- stereomicoscope

Keywords

- electron microscopy
- SEM
- EBSD
- EDS
- materials science
- FIB
- medical technology
- materials technology

Networks

Users per annum

Internal Users: 50
External Users in total: 15
External Users: 15
External Users in the EU: -
External Users outside of EU: -