

## Details

### Institute of Solid State Physics, Section Electron Microscopy (IFP-Elektronenmikroskopie)

The working group Electron Microscopy at the Institute for Solid State Physics is engaged in the development of quantitative electron microscopy methods. Currently, the group consists of 10 staff members who have high expertise in the field of electron microscopy and materials science. As part of the Institute of Solid State Physics, the focus lies in the analysis of nanostructures such as nanowires, semiconductor heterostructures, semiconducting oxide materials, nanoporous gold and metallic nanoparticles. Besides several instruments for sample preparation, the working group is provided with an FEI Nova 200 Nanolab dual beam system. The FEI Titan 80-300 transmission electron microscope (TEM) with aberration corrector for the objective lens installed in 2008 allows analyses in the subnanometer or subångström scale. The Titan microscope is equipped with a Si (Li) EDX detector and an energy filter. In 2021, the working group was provided with a Thermo-Fisher SPECTRA 300 TEM with probe corrector. This microscope is equipped with a monochromator, a Super-X EDX detector, a pixel array detector (EMPAD) with an acquisition rate of 1000 images per second and several tomography specimen holders. The electron microscopes of the working group are integrated into the "MAPEX Center for Materials and Processes" Core Facility.

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### Host Institution

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<https://www.uni-bremen.de/mapex>

### Scientific Domain

**Primary Subjects:**

- Physics
- Materials Science and Engineering

**Secondary Subjects:**

- Biology
- Chemistry
- Mechanical and Industrial Engineering

### Category

Micro- and Nanotechnology facilities

### Scientific Services

As a longtime cooperation partner of scientific and industrial research and development groups the working group Electron Microscopy provides external users with a pool of different electron microscopy analysis techniques. The provided services range from specimen preparation over planning and realization of experiments to data analysis and survey of results. While the measurements at the microscopes are usually performed by working group staff, external users can perform specimen preparation and data analysis self-directed after a short introduction. However, a full

specimen characterization by an employee of the working group is also possible. This includes specimen preparation, data acquisition/analysis and a compilation of results. Depending on the scientific problem a SEM/FIB system (FEI Nova 200 Nanolab) and two TEMs (Thermo-Fisher Spectra 300, Titan 80/300) are available for experiments. While the Spectra 300 with its probe-corrector and monochromator is well suited for STEM applications, the Titan 80/300 allows the acquisition of aberration-corrected TEM images. Both TEMs are also equipped with a variety of detectors that allow for spectroscopic analysis such as EDX or EELS.

## Scientific Equipment

- Thermo-Fisher SPECTRA 300
- FEI Titan 80-300 STEM
- Analytical Tomography Holder
- Tomography Holder, Fischione, Model 2020
- Double Tilt Tomography Holder, Fischione Model 2045
- On-Axis Rotation Tomography Holder Fischione, Model 2050
- DensSolutions Biasing Holder
- Double Tilt Heating Holder, Gatan Model 652
- Double Tilt Kryo Holder, Gatan Model 636
- FEI Nova 200 FIB
- Allied HTP MultiPrep
- Gatan Model 691 PIPS
- Technoorg Linda Model IV5 Ion Mill
- Hitachi Zone TEM Sample Cleaner
- Ditabis micron Imaging Plate Scanner

## Keywords

- transmission electron microscopy (TEM)
- high-resolution TEM (HRTEM)
- scanning TEM (STEM)
- high-resolution STEM (HRSTEM)
- electron energy loss spectroscopy (EELS)
- energy dispersive x-ray analysis (EDX)
- electron holography
- electron tomography
- Focussed Ion Beam (FIB)
- Ion Mill
- Precision Ion Polishing System (PIPS)
- light emitting diode (LED)
- semiconductor
- electron optics
- solid state research

## Networks

### Users per annum

**Internal Users:** 7 interne Nutzer  
**External Users in total:** 9  
**External Users:** 7  
**External Users in the EU:** 0  
**External Users outside of EU:** 0