The Institute of Micro- and Nanostructure Research (IMN) and the Center for Nanoanalysis and Electron Microscopy (CENEM) at the Friedrich-Alexander-University Erlangen-Nürnberg (FAU) is looking for motivated and enthusiastic

Doctoral Researcher (f/m/d) in Scale-Bridging Correlative Tomography

to join our team!

Position Overview:

We invite applications for a motivated doctoral researcher to join our interdisciplinary team specializing in scale-bridging correlative tomography to investigate hierarchical porous structures. The successful candidate will focus on characterizing stationary phase materials (SPMs) used in chromatography, as well as other porous materials, utilizing state-of-the-art imaging techniques such as electron tomography (ET), nano X-ray computed tomography (nano-CT), and micro-computed tomography (micro-CT).

Key Responsibilities:

- Conduct detailed 3D characterization of porous and particulate materials on different scales with the overarching goal of understanding irregularities and designing optimized porous structures.
- Develop tailored sample preparation workflows, including laser ablation and focused ion beam (FIB), for correlative imaging experiments.
- Refine workflows and algorithms for data acquisition, reconstruction, and registration to enhance correlative 3D reconstructions.
- Implement advanced machine and deep learning segmentation strategies to improve quantitative analysis of hierarchical pore networks.
- Collaborate with material synthesis teams to optimize SPM structures based on imaging feedback.
- Analyze 3D pore data to support simulations of diffusion, transport, and particle self-assembly.

Your Qualifications:

- Master's degree or equivalent in Materials Science, Physics, Chemical Engineering, or a closely related field with competitive grades.
- Strong interest in tomographic imaging techniques and data analysis.
- Good communication skills and the ability to work both independently and collaboratively.
- Able to work in an interdisciplinary team, high level of independence and diligence.
- Able to present ideas and results to a broad audience.
- Proficient in the English language; proficiency in the German language is beneficial though not essential.

Desirable Qualifications:

- Prior experience with SEM/FIB, TEM or X-ray microscopy methods is a plus but not required.
- Experience with tomographic imaging techniques and data analysis.
- Programming skills and familiarity with image processing and analysis software.
- A keen interest in advancing methodological developments in tomography and materials characterization.

What We Offer:

- A dynamic research environment with access to cutting-edge microscopy and tomography facilities.
- Opportunities for interdisciplinary collaboration and networking within the scientific community.
- A comprehensive training program and mentorship from leading experts in the field.

Your Online Application Should Include:

- Letter of motivation including justification of your suitability for the described project (max. 4000 characters).

- CV listing: educational and vocational history, key skills and academic achievements, publications and oral presentations (max. 2 page).
- Copy of your Master degree certificate (if not yet available, please send Bachelor certificate instead) along with full academic transcripts.
- Two academic letters of recommendation.

Contact:

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Submission Is Possible Until: 30 September 2025

More Information:

The CENEM, a well-established expertise center and user facility for electron microscopy and nanoanalysis at FAU, runs a number of state-of-the-art microscopes in the field of transmission electron microscopy, scanning electron microscopy and X-ray microscopy, as well as a well-equipped laboratory for sample preparation. The IMN, a research institute of the Materials Science Department, explores the advanced capabilities of CENEM's instrumentation for cutting edge research on new materials, a major research focus of the university.

The position is embedded in the Collaborative Research Center (CRC) 1411, which is an initiative funded since 2020 by DFG focused on predictive model based design and practical process realisation of particulate products. These range from single nanoparticles with controlled shape and composition, through hierarchically organised assemblies of particles, up to particle packings with optimised optical properties. Such particles are produced by continuous syntheses directly coupled to classification by chromatography. The research is carried out at FAU Erlangen-Nürnberg and involves the Departments of Chemical and Biological Engineering, Materials Science and Engineering, Mathematics, Chemistry, and Physics. One project is located at the NanoEnergieTechnikZentrum of the University of Duisburg-Essen.

CRC 1411 offers appealing benefits to doctoral researchers, including wide access to equipment, collaborations, dual mentoring, soft skills, support for conference contributions, the possibility for research stays abroad, summer/winter schools etc. These measures are provided by the integrated Research Training Group.

FAU is a member of “The Family in Higher Education Institutions” best practice club and aims to increase the number of women in scientific positions. Female candidates are therefore particularly encouraged to apply.

The FAU is interested in increasing the share of women in research and teaching positions and therefore explicitly encourages female candidates to apply. Physically disabled applicants receive favorable consideration when equally qualified.

Severely disabled persons in the sense of the Disabled Persons Act will be given preferential consideration over other candidates of equal professional qualification and personal suitability if the advertised position is suitable for severely disabled persons. If desired by the applicant (m/f/d), the Equal Opportunities Officer can be involved in the job interview without any disadvantage to the applicant (m/f/d).