FRIEDRICH-ALEXANDER
UNIVERSITÄT
ERLANGEN-NÜRNBERG

TECHNISCHE FAKULTÄT

The chair of Electron Devices (LEB) offers a **PhD position (m/f)** on

In situ Transmission Electron Microscopy of electrochemical processes

Nanostructures or nanopatterned surfaces show strongly enhanced (electro-)chemical reactivity due to their large surface-to-volume ratio. Vice versa, nanostructures are subject to very fast degradation in e.g. corrosive environment.

The aims of this project are:

- the establishment of micro-engineered TEM liquid cells for the observation of electrochemical processes at the nanoscale and
- the development and conduction of reference experiments in electrochemical liquid cells.

Both tasks build on the excellent infrastructure and knowledge available at the Center for Nanoanalysis and Electron Microscopy (CENEM) and the joint cleanroom facility of University of Erlangen-Nuremberg (FAU/Chair of Electron Devices) and Fraunhofer IISB.

In a first approach, the available TEM cell architectures will be advanced by the incorporation of electrical contacts for the later manipulation and control of in situ reactions. The PhD student will apply bulk micromachining and other microelectronic techniques to define the electrodes and the wiring to the external control devices. The experimental side will involve advanced TEM techniques like high-resolution imaging, tomography and STEM EDXS. The experimental design will be developed under guidance of the advisors and includes strategies for the introduction and attachment of the specific nanomaterial (film, particle) to the electrodes. Reactions of interest may cover but are not limited to electrochemically induced growth, decomposition or oxidation phenomena. The comparison of reaction kinetics against their large-scale counterparts as well as the observation of early stages of the process are of special importance.

The applicant should be open to broad interdisciplinary cooperation within the Research training group GRK 1896 “In situ microscopy with electrons, X-rays and scanning probes” at the Friedrich-Alexander-University of Erlangen-Nuremberg (FAU) and should be fluent in English and German. Previous practical and scientific experiences in at least one of the fields microelectronics technology or experimental transmission electron microscopy will be of advantage.

The salary is according to German standard (100% E13 TL-V). The PhD position will be for 3 years (with potential extension) with evaluation after 1 year. **The position will be filled as soon as possible**.

The University of Erlangen-Nürnberg 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.

Please send your application by email to Prof. Dr. Lothar Frey (lothar.frey@leb.eei.uni-erlangen.de)

If you should have any further questions, please contact

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