

Phd Student Position: Liquid-Phase 3d Electron Microscopy For Studying Nanoparticle Uptake

A PhD student position is available at the INM-Leibniz Institute for New Materials in Saarbruecken within the framework of the project Liquid3DSTEM that is in cooperation with the MATEIS laboratory at INSA-Lyon, France, and is funded by the French Research National Agency (ANR) and the Deutsche Forschungsgemeinschaft (DFG).

Electron microscopy has traditionally been associated with the study of thin solid samples in vacuum. However, during the last decade, a few groups were able to pioneer systems that are enabling nanometer resolution in the analysis of specimens suspended in liquid. The broad applicability of liquid phase electron microscopy has driven a wave of interest as it has opened exciting possibilities for solving grand challenges in materials science, chemistry, biology and other fields and has opened the route for operando studies. Whatever the application field, a three-dimensional (3D) representation of the sample in liquid is often required for understanding its morphology and chemical distribution. The primary method for obtaining insight into the 3D morphology at the nanometer scale of unique samples from biology and materials science is tilt-series transmission electron tomography. The goal of the project Liquid3DSTEM is to establish liquid-phase scanning transmission electron tomography as new 3D microscopy modality, presenting unique way for nanoscale characterization of samples in liquid from both materials science and biology.

The PhD research involves acquiring detailed understanding of the image formation, and establishing the method of 3D image reconstruction. In the second phase of the project, Liquid3DSTEM will be used to study nanoparticle uptake in mammalian cells. Extensive cooperation is planned with the Lyon lab for method optimization and for application in materials science. The project is integrated in the core research activities of the group. For our research, we use a state-of-the-art facility containing an aberration corrected scanning transmission electron microscope, a scanning electron microscope, and a fluorescence microscope.

The applicant should have a Master's degree in physics, biophysics, biochemistry, or materials science, ideally (but not necessarily) with experience in electron microscopy. He/she should have a strong interest for experimental work, data analysis, and image processing. He/she should be open-minded, thorough in his/her work, and able to work very carefully. He/she should also be able to work in team, and exhibit excellent writing and oral communication skills in English, and proficient communication skills in German.

INM is an equal-opportunity employer with a certified family-friendly policy. We promote the professional opportunities of women and strongly encourage them to apply.

Contact

Please send your motivation letter via email to the attention of Prof. Niels de Jonge including a detailed CV and a letter of recommendation not later than Dec. 15, 2020. The attachment should be a single pdf-file <5 MB:

E-mail: diana.loeb@leibniz-inm.de

Reference: "liquid phase electron microscopy of dynamic protein interactions"

Group website: <https://www.leibniz-inm.de/en/innovative-electron-microscopy/>



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