Post-Doctoral Position in Dynamic Liquid Cell Transmission Electron Microscopy
University of Chicago, Pritzker School of Molecular Engineering

Liquid Cell Transmission Electron Microscopy (LCTEM) is an evolving analytical methodology which allows investigators to gain insights into the developing area of understanding interactions and processes surrounding nanoscale materials in liquids at a high spatial resolution.

A multi-year Post-Doctoral research position is now open in this area at the University of Chicago, Pritzker School of Molecular Engineering. This position is funded through a U.S. National Science Foundation Major Research Instrumentation (MRI) Consortium (Award Number: 2117896 - Dynamic PicoProbe Project for Multi-Modal, Multi-Dimensional HyperSpectral Imaging of Soft/Hard Matter and Interfaces in Environmental Media). The Post-Doctoral candidate will work closely with the project PI team consisting of Profs. Junhong Chen, Paul F. Nealy and Chong Liu of the University of Chicago, Prof. Benjamin J McMorran at the University of Oregon, and Drs. Arvind Ramanathan and Nestor J. Zaluzec of Argonne National Laboratory (ANL).

Through this project the candidate will be part of a highly collaborative research effort which seeks to enable quantitative investigations of liquid/solid/hard/soft matter interfaces for time-resolved, high-resolution in-situ environmental observations using advanced PicoProbe Analytical Electron Microscope. These measurements are critical to advance multiple frontiers in science and engineering, such as engineered nanomaterials, organic/inorganic heterostructures, biointerfaces, macromolecular complexes, and quantum electronics.

The PicoProbe is an advanced next-generation analytical electron microscope which is located in the Materials Design Laboratory at ANL. This monochromated, aberration corrected, probe forming analytical electron microscope facilitates state-of-the-art correlative studies of the morphology, crystallography, elemental, chemical and electronic structure composition of matter in static and dynamic environments. It is combined with the world’s highest sensitivity 4 sR detector for x-ray spectroscopy (the XPAD) and the unique ZTwin lens. The PicoProbe is fully equipped for TEM/STEM/DPC and 4DSTEM operations with conventional and pixel array imaging and diffraction detectors. It has a full complement of ambient, cryogenic, tomographic, and ptychographic holders as well as custom liquid cell holders for in-situ studies. A high energy resolution Electron Imaging and Spectrometry system will be added in late 2022. In collaboration with the ANL Computational Science Division, the system will also be integrated into an artificial intelligence/machine learning (AI/ML) workflow.

We are looking for a candidate with excellent skills, curiosity, and ambitions. Preference is for applicants with a strong background both in developing LCTEM systems and methods, as well as applications of LCTEM in the Transmission Electron Microscope. A background in relevant application fields such as materials science, water, and electrochemistry is a plus. In this position, the candidate has a unique opportunity to advance beyond simple observational modes to enable new discoveries and improve our temporal measurement capabilities to record dynamic changes of materials at the nanoscale in environmental media and enhance our dynamic imaging detectability. In addition, the candidate will be collaborating with students and faculty users on the PicoProbe instrument to help facilitate their LCTEM research.
Interested candidates should electronically submit a cover letter, a CV and a list of three references to Jennifer Nolan at jmnolan@uchicago.edu and copy junhongchen@uchicago.edu and zaluzec@uchicago.edu.

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