Postdoctoral Fellow in Monochromated EELS and In Situ Electron Microscopy

A postdoctoral position is available at Arizona State University in the general area of monochromated electron energy-loss spectroscopy (EELS) and in situ environmental transmission electron microscopy (ETEM) applied to photocatalytic materials systems. Developing a fundamental understanding of catalytic systems will have a potentially large impact on areas such as energy, healthcare, materials, medicine, transport, and the environment. Photocatalytic generation of solar fuels such as hydrogen is a potential path for solar energy storage. An important step in developing an improved understanding of the functioning of inorganic photocatalysts is to determine structure-reactivity relations at the nanometer and atomic level. Our long-term goal is to understand how atomic structures/defects and nanoparticle configurations regulate electronic/optical/catalytic properties to facilitate the design of next generation photocatalysts for solar fuel production. We will employ monochromated EELS to explore how resonant energy transfer or transduction processes can be employed to channel and direct photon energy directly to photoactive surfaces of nanoparticles. To explore energy transfer, we will manipulate the architectures of the composite photocatalytic systems and probe structure and functionality with advanced in situ imaging and spectroscopy techniques available in (scanning) transmission electron microscopy combined with theoretical modeling. A special emphasis will be in using monochromated low-loss EELS to investigate coupling between photonic, plasmonic, excitonic and phononic modes in catalysts. The postdoc will perform activities including photocatalyst characterization using monochromated EELS, aberration corrected scanning transmission electron microscopy (STEM), and in situ ETEM.

Basic Qualifications:
- A Ph.D. in physics, materials science or related disciplines is required.
- Experience in monochromated low-loss EELS, aberration corrected STEM, high resolution TEM imaging, in situ electron microscopy.
- Experience with characterization and applications of nanoparticle systems/catalysts.

Preferred Qualifications:
- A working knowledge of photocatalysts, catalytic testing, and dielectric theory for EELS modeling is also desired but not essential.
- Experience in scripting (Python, Matlab) for processing of EELS and S/TEM data.
- Proficiency with TEM software (Digital Micrograph, Nion Swift, ImageJ).

To apply, please send your cover letter (specifying EELS and in situ position), CV and names with contact information of three references to:

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