Postdoctoral Position in Quantitative Transmission Electron Microscopy and Electronic Structure Determination at the University of Pittsburgh

We invite applications for a postdoctoral position at the University of Pittsburgh with Professor Jörg Wiezorek in the Department of Mechanical Engineering and Materials Science. The work is focused on developing and applying advanced transmission electron microscopy (TEM) experiments using quantitative convergent beam electron diffraction (CBED) for the experimental determination of electronic bonding charge density distributions in crystals. The materials of primary interest are transition metals and transition metal based materials, including intermetallic phases. The TEM CBED measurements will be complemented by density functional theory (DFT) based calculations. This promises development of electronic structure and interatomic bonding detail based understanding of material properties and enables accelerated validation of DFT predictions. The ideal candidate combines skills in experimentation using modern TEM instruments and competency in crystallography and electron diffraction theory with an interest in computer simulation and programming. The work is part of a federal agency funded program of research and offers opportunity for extensive interaction with faculty experts in materials science experimentation, modeling, and fundamental theory.

A PhD in materials science, physics, chemistry, or a related field is required. Experience with modern TEM instrumentation and its use in the study of crystalline materials is necessary. Familiarity with modern programming language(s), programming and optimization techniques, computer simulations of electron diffraction data (e.g. MBFIT) and electronic structure using popular DFT simulation software (e.g. WIEN2K) is desirable. The successful candidate is expected to perform quantitative experimental analyses of the electronic and crystal structure of relevant materials by electron and X-ray beam methods, e.g. TEM, CBED, HREM, XRD, sample preparation, and associated theoretical calculations and computer simulations. Duties will also include interpretation of the research results, as well as preparation of scientific publications and dissemination of the research activity results.

The appointment is initially for one year with the possibility of extension for up to three years, depending on performance and availability of funding. Interested applicants should send a CV in PDF format and contact information for three (3) references to Professor Wiezorek at Wiezorek@pitt.edu. Review of applicants will begin immediately and will continue until the position is filled. For further information on research in Professor Wiezorek’s groups please visit http://www.engineering.pitt.edu/JorgWiezorek/.