

Ultrafast Free Electron Laser Program – Research Associate for X-Ray Scattering (BCDI)

BNL Overview

Brookhaven National Laboratory is a nonprofit research and development institution whose purpose is to advance ideas and knowledge through a multidisciplinary program of basic and applied research. The Department of Condensed Matter Physics and Materials Science currently has a full-time opportunity for a Research Associate.

Organization Overview (short paragraph about the Division or Department as it pertains to the position):

The Condensed Matter Physics and Materials Science Department has a very strong tradition of research into strongly correlated materials using several experiment techniques including x-ray scattering, neutron scattering and photoelectron spectroscopy, etc. This is complemented by excellent sample synthesis capabilities and strong theoretical support. The X-ray Scattering Group specializes in Resonant Inelastic X-ray Scattering (RIXS), Bragg Coherent Diffraction Imaging (BCDI) and X-ray Total Scattering for Pair Distribution Function (PDF) and benefits from close collaboration with beam-lines at the National Synchrotron Light Source II.

Brookhaven National Laboratory was recently awarded a grant entitled Dynamics and Control of Magnetic and Charge Order in Complex Oxides -- one of 10 nationwide programs for advancing x-ray free electron laser studies aiming to advance our understanding of chemical and materials science. The collaboration involves 8 PIs and 5 research associates working together to deliver detailed pictures of ultra-fast spin and charge behavior in complex oxide materials and how this organizes into domains once it couples to the lattice. This multi-degree of freedom, multi-length-scale understanding of canonical strongly correlated oxides is a vital step towards “properties on demand” via strategic ultra-fast excitation of quantum materials.

The successful candidate will work with Ian Robinson and Mark Dean in the X-Ray Scattering Group alongside Ivan Bozovic, Pavol Juhas, Jing Tao, Robert Konik, Weiguo Yin and Yimei Zhu who provide expertise in molecular beam epitaxy, complex data analysis, ultra-fast electron diffraction and theory.

Essential Duties and Responsibilities:

The successful candidate will develop Bragg Coherent Diffractive Imaging (BCDI) techniques to probe charge and magnetic ordering in quantum materials in the ultrafast time domain. This involves preparing and performing state-of-the-art x-ray scattering experiments, analyzing the data and disseminating the conclusions in scientific publications and talks.

Required Knowledge, Skills and Abilities:

A PhD in experimental condensed matter physics or related field within 5 years of the application date

A good understanding of the science of quantum materials, such as complex oxides, or related materials

Excellent English-language written and oral communication skills

Self-motivated and able to work both independently and as part of a team.

While principally based at Brookhaven National Laboratory, candidates must be willing to travel to carry out experiments at various national facilities.

Preferred Knowledge, Skills, and Abilities:

Experience in scattering techniques such as x-ray scattering, neutron scattering, photoelectron spectroscopy etc.

Familiarity with proposal submission procedures and effective completion of experiments in fixed time-slots using national-scale central facilities.

Strong data analysis skills. Knowledge of programming languages such as python is and experience with large datasets is preferred.

Other Information (Security Clearance, drivers' license, use of private car, location, travel requirements)

This position will require national and international travel to central user facilities such as the Linear Coherent Light Source.

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- Medical Plans
- Vacation
- Holidays
- Dental Plans
- Life Insurance
- 401(k) Plan
- Retirement Plan
- On site, Swimming Pool, Weight room Tennis Courts, and many other employee perks and benefits

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