

ORNL Publications

External Publication

Job Posting Title

Postdoctoral Research Associate – Ultrafast Laser Spectroscopy of Nanomaterials and Energy Transport / NB50352787

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Purpose

Under general supervision, the incumbent will focus on the ultrafast laser spectroscopy of nanomaterials and the characterization of energy transfer at interfaces with both organic and inorganic molecules, polymers and nanomaterials utilized for organic electronic devices. This position resides in the Functional Hybrid Nanostructure Group in the Center for Nanophase Materials Sciences (CNMS) Division, Physical Sciences Directorate (PSD) at Oak Ridge National Laboratory (ORNL).

Major Duties/Responsibilities

- Perform fundamental ground- and excited-state spectroscopy of primarily 2D nanomaterials, such as graphene and chalcogenides and their hybrids
- Work with other CNMS postdocs and staff who are involved in the synthesis, characterization, and device applications of nanomaterials, small molecules, and polymers synthesized at CNMS as well as atomic-resolution TEM, STM characterization
- Develop ultrafast laser techniques to characterize exciton and charge transport dynamics in nanomaterials including 2D nanostructures and their hybrids with organic molecules
- Participate in the user-initiated research program at the CNMS, developing laser spectroscopic techniques to investigate nanomaterials, e.g., nonlinear laser spectroscopy, as well as laser-based synthesis and processing, including femtosecond laser ablation and surface structuring
- Help to establish the user facilities in this area, collaborating with and supporting users, and for operating and maintaining the facilities
- Consult with CNMS/ORNL staff in the development of collaborative user facilities; provide scientific support and train a variety of users at the CNMS to carry out ultrafast laser spectroscopic experiments with nanomaterials such as graphene, carbon nanotubes, nanowires, and nanoparticles, as well as their functional hybrid nanostructures
- Ensure compliance with environment, safety, health and quality program requirements
- Maintain strong commitment to the implementation and perpetuation of values and ethics

Qualifications Required

A PhD in Physics, Chemistry or Materials Science or a related discipline within Physical Sciences and be within five years of receiving their Doctorate is required. The incumbent must be familiar with the operation, alignment, and tuning of both femtosecond and picosecond lasers as well as OPA and OPO lasers. The ability to conduct creative, independent research is required. The incumbent must have a strong interest and skills in ultrafast lasers and laser spectroscopy including nonlinear effects and be capable of innovative, independent research in this area. Excellent interpersonal skills and oral and written communication skills are mandatory. The ability to work collaboratively in a team environment and interact effectively

with a broad range of colleagues are keys to success. The ability to communicate in English to an international scientific audience and a strong record of productive and creative research demonstrated by publications in peer-reviewed journals are required. Working knowledge of Microsoft Office (which includes Word, PowerPoint, and Excel,) required. Proven ability to function well in a fast-paced environment. Must be able to set priorities, multi-task and adapt to ever changing needs. The abilities to work on multiple tasks in a limited amount of time and to independently set priorities to accomplish multiple tasks to meet deadlines are required.

This position is for one year with the option to renew term for an additional one to two years.

QUALIFICATIONS DESIRED: A strong background in femtosecond lasers, pump-probe spectroscopy, and data acquisition techniques (LabVIEW, MATLAB, etc.) to explore the dynamics of excited states in nanomaterials and their hybrids with organic molecules and polymers is desired. Chemistry experience is also desirable. Experience in Raman spectroscopy and nonlinear laser methods, such as second and third harmonic laser spectroscopy, is also highly desirable.

Work Directions and Interfaces

Position reports to the Group Leader, CNMS Functional Hybrid Nanostructures Group. Interfaces with administrative staff, managers and visitors to ORNL.

This position will remain open for a minimum of 5 days after which it will close when a qualified candidate is identified and/or hired.

We accept Word(.doc, .docx), Excel(.xls, .xlsx), PowerPoint(.ppt, .pptx), Adobe(.pdf), Rich Text Format(.rtf), HTML(.htm, .html) and text files(.txt) up to 2MB in size. Resumes from third party vendors will not be accepted; these resumes will be deleted and the candidates submitted will not be considered for employment.

If you have trouble applying for a position, please email ORNLRecruiting@ornl.gov.

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