

Post doctorate and PhD positions in Photonics / Optoelectronics of Disordered Organic Semiconductors

Institute of Physics and Astronomy, University of Potsdam



Job description:

The groups of Dr Safa Shoaee and Professor Dieter Neher, at the University of Potsdam (Institute of Physics and Astronomy) invite applications for experimental postdoctoral and PhD positions in the field of optoelectronics of disordered semiconductors. The interdisciplinary research projects focus on developing novel methods and models for new types of photonic devices.

The successful candidates will participate in the experimental investigations and contribute to the development of models of charge carrier motion in disordered semiconductors. This project will involve working together with other nationally- and internationally-renown groups in the field. The project will explore recent advances in optoelectronic techniques, to study recombination of charge carriers in disordered materials used in efficient light harvesting systems. By combining sophisticated experiments with high-level theory development and modelling, we aim to develop a fundamental understanding of the mechanisms governing the dynamics of highly efficient thin film disordered solar cells that would open new avenues and guide the future experimental work.

For examples of recent work please check:

- Nature Comm. (2016), 7 <http://www.nature.com/articles/ncomms11944>
- Adv. Energy Mater. (2016), 22 <http://onlinelibrary.wiley.com/doi/10.1002/aenm.201600939/full>
- Nature Comm. (2015), 7083 <http://www.nature.com/articles/ncomms18083>

Job Offer:

The starting date is flexible but ideally will be before 1st May 2017. The PhD position is for 3.5 years and the post doc position is initially for to 2 years which is subject to extension. The payment is according to the German TV-L salary scheme.

Key responsibilities:

- Setting up a pre-designed laser spectroscopic experiment which involves optics (ray optics and beam shaping), stray light control, low signal detection and noise reduction, Vis-NIR photodetection, LabVIEW coding and automation.
- Co-supervising PhD students (relevant to Post doc).
- Performing spectroscopic measurements using semiconductor devices such as diodes and transistors.
- Undertaking quality research and publication in a multidisciplinary field of research.
- Lab duties.
- Presentation of results at conferences and meetings.

Required skills and experience:

- BSc and MSc in Physics or equivalent
- PhD in physics, photonics or related (relevant to Post doc).
- LabVIEW and Matlab.
- Comprehensive experience in setting up optics-based measurements and extensive knowledge of optics, photonics and weak signal detection in Vis and NIR.

Preferred skills and experience:

- Knowledge of condensed matter physics, photophysics, optoelectronic properties of semiconductors, and semiconductor device physics.
- Experience in fabrication and characterization of photodiodes and/or solar cells made of disordered materials such as organic, perovskite and nano-crystals.
- Experience in spectroscopic techniques such as pump-probe methods in molecular systems and ultra-fast photoinduced absorption.

We offer:

- Possibility to work in a lab where highly innovative techniques are being employed.
- Work place where people with novel ideas and passion for realization can try new things.
- Open space for interdisciplinary studies.
- Highly motivating and friendly team environment.

Application procedure:

Any interested candidates are encouraged to mail their CV and motivation letter to Safa Shoaee (shoai@uni-potsdam.de). Informal enquiries are encouraged. Applications will be considered until a suitable candidate has been identified.

About the employer/this job:

The research groups of Shoaee and Neher investigate charge carrier generation, transport and recombination in solar cells made of disordered semiconductors such as organic molecules and polymers. The groups utilize a wide range of advanced optical and optoelectrical techniques to unravel recombination dynamics in disordered semiconductor solar cells. This research project will address the molecular-scale processes in organic optoelectronic devices – solar cells, which are believed to become low-cost renewable energy and light sources of the future. We aim to gain a fundamental nanoscale understanding of charge, energy and structural dynamics in organic materials as well as other disordered systems. For this, we combine new spectroscopic methods, material science expertise, and electronic device characterisation. Our team broadly collaborates with a number of world class research groups working on organic materials and electronic systems (organic solar cells, transistors, molecular light-emitting diodes) and spectroscopy worldwide.