POSITION DESCRIPTION

Australian Research Council Centre of Excellence in exciton science

Melbourne-Bayreuth IRTG Joint PhD Program

PhD Scholarship to study control of excitons in single polymer chains

Position Summary

The Universities of Melbourne and Bayreuth have created a new, joint PhD program. Students from each University spend a minimum of 12 months at the partner University and submit a PhD thesis at each location. Students need to be Australian residents and have an undergraduate mark equivalent to those required for an APA. The project listed below is supported through the ARC Centre of Excellence in Exciton Science (ACEx).

ACEx: The overall mission of ACEx is to examine and manipulate the way light energy is absorbed, transported and transformed in advanced molecular materials. This project is a collaboration between the School of Chemistry and the Department of Physics at Universität Bayreuth. ACEx values equity and diversity and promotes an inclusive workplace culture for staff irrespective of their gender identity, ethnicity, or cultural background. We recognise that diversity drives excellence and innovation in research and teaching and a key objective is to lift the proportion of women in our workplace.

Project Outline: The distribution of conjugation lengths with a conjugate polymer chain gives rise to a distribution of absorption and emission wavelengths. Excitons formed within a conjugated polymer following electronic excitation can relocate along and between polymer chains from high energy, short to low energy, long conjugation length segments. The distribution of conjugation lengths can be influenced by stretching the polymer chain, which we aim to do via various approaches and thereby control the fate of the excitons produced by light absorption, and employ single molecule microspectroscopy methods to probe the steady-state and time-resolved emission properties under these stretched conditions. Nanofabricated structures will be fabricated and conjugated polymers will be studied in using single molecule spectroscopic techniques in both Melbourne and Bayreuth working with Prof. Jürgen Köhler. We are seeking an Australian student to work on this project as part of a joint PhD with the University of Bayreuth. The successful student will spend a minimum of 12 months at Bayreuth. Knowledge of German is not essential but useful. Students with an interest in laser spectroscopy and/or single molecule spectroscopy are sought.

Location: The Ultrafast and Microspectroscopy Laboratory is located in the School of Chemistry, University of Melbourne.

Selection Criteria

ESSENTIAL

- MSc or equivalent in microscopy and/or laser optics;
- Excellent written and oral communication skills;
- Demonstrated organisational skills, time management and ability to work to priorities;
- Demonstrated problem solving abilities;
- The ability to work independently and as a member of a team.

DESIRABLE

- Experience in optical instrumentation, spectroscopy, chemical synthesis and purification.

SALARY LEVEL: A $31 200 p.a. stipend (tax free). Further information on benefits is available here https://scholarships.unimelb.edu.au/awards/graduate-research-scholarships.

EMPLOYMENT TYPE: Stipends are available for minimum 3 years, subject to satisfactory progress. **CONTACT:** A/Prof Trevor Smith Email: trevoras@unimelb.edu.au