



Melbourne-Bayreuth IRTG Joint PhD Program

PhD Scholarship to Study Morphology Manipulation for Increased Singlet Fission Yields

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 Australian Renewable Energy Agency (ARENA).

This project is a collaboration between the School of Chemistry and the Department of Physics at Universität Bayreuth. The School of Chemistry 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: We are looking for a suitably qualified graduate student to work on a jointly funded PhD project between the University of Melbourne and the University of Bayreuth on Singlet Fission Materials. The goal is to improve the efficiency of solar cells by effectively harnessing polymeric singlet fission materials.

For typical solar cells when photons with greater than twice the bandgap energy are absorbed, the excess energy is lost through thermalisation. Singlet fission is the process where we can use the excess energy in these high energy photons to generate two triplet excitons from a singlet exciton. Polymeric singlet fission materials often have higher triplet exciton yields than molecular intra-molecular singlet fission materials, even though they comprise the same building blocks. This is thought to be due to the increased delocalisation of excitons in polymeric materials, allowing for dephasing and separation of the initially generated correlated triplet pair. If we align the polymer can we increase the singlet fission yield, and increase the triplet lifetime? Materials will be synthesised in the Jones laboratory, with spectroscopic studies regarding the electronic and morphological structure in A. Köhler group in Bayreuth. The successful student will spend a minimum of 12 months at Bayreuth, Institute of Physics. Knowledge of German is not essential but useful. Students with an interest in X-ray spectroscopy/ laser spectroscopy and/or polymer synthesis are sought.

Location: The Organic Electronics Laboratory is located in Bio21 Institute at the University of Melbourne.

Selection Criteria

ESSENTIAL

- MSc or equivalent in polymer synthesis;
- 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 organic photovoltaics, chemical synthesis and purification.

SALARY LEVEL stipend (tax-free) plus justified relocation expenses.

A\$31,200 p.a.

START DATE Applications close June 1, 2020. Start date in late 2020.

EMPLOYMENT TYPE Stipends are available for minimum 3 years, subject to satisfactory progress.

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