

PhD Position in Energy Transfer in Nanocrystal Hybrids

Position Summary

We are looking for a suitably qualified graduate student to work on an ARC Centre of Excellence in Exciton Science (ACEEx) funded project on the movement of energy across nanocrystal interfaces. The goal is to direct movement of energy in nanoscale systems with applications in luminescent solar concentrators.

ACEEx: The overall mission of ACEEx is to examine and manipulate the way light energy is absorbed, transported and transformed in advanced molecular materials. This project is within the Monash University Node of ACEEx in The School of Chemistry. ACEEx 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: Energy transfer plays a key role in photosynthesis within which energy from sunlight is transferred to the reaction centre. The absorption and transfer of energy from photons is also a key process in the development of solar photovoltaic cells. The challenge within the field of energy transfer is achieving structures which undergo efficient energy capture and transfer with low losses at the molecular or particle level, along with the organisation of these single systems into larger films. This project will focus on the energy transfer from asymmetric luminescent semiconducting nanocrystals (for example quantum-confined nanorods) to molecular and nanocrystalline acceptors. It will explore the optimal geometry of the system to achieve highly efficient energy transfer within a single energy transfer system and the effect of the interface on energy transfer. An additional aim will be the formation of the single structures into films which show directed energy transfer. The project will use single particle spectroscopy techniques such as confocal microscopy and time-resolved luminescence techniques. It will suit a student with a strong background in spectroscopy including transient techniques such as fluorescence lifetime measurements.

Project Details and Location: The position will be situated in the Nanoscale Spectroscopy Laboratory in the School of Chemistry, Monash University, Melbourne.

Selection Criteria

Essential

- BSc(Hons), MSc or equivalent with CGPA > 85% in chemistry or a related field;
- 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 fluorescence spectroscopy, including time resolved.
- Experience in nanocrystal chemical synthesis, purification and characterization.
- Experience in confocal microscopy/single particle spectroscopy.

Stipend A\$27,872 p.a. stipend (tax-free) plus justified relocation expenses.

Start Date Available now.

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