

PhD Position in Atomic Level Structure of Passivated Quantum Dots

Position Summary

We are looking for a suitably qualified graduate student to work on an ARC Centre of Excellence in Exciton Science (ACEx) funded project on nanocrystal surfaces. The goal is to map the atomic level structure of well passivated nanocrystal surfaces, identify the chemical structures of trap states and improve nanocrystal quantum yield.

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 Schools of Chemistry and Materials Engineering at Monash University and The University of Melbourne. 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 colour of light emitted by semiconductor quantum dots can be changed by changing only the size of the nanocrystal. The atomic structure at the surface of the quantum dots can determine the amount of light emitted by the quantum dots and this is important for incorporation of quantum dots into LEDs and in sensing applications. In this project, we aim to investigate the surface structure of quantum dots at the atomic level. The project will develop and apply high-resolution transmission electron microscopy methods to determine the surface structure of the quantum dots and correlate these with optical properties. It will suit a student with a background in physics, chemistry or materials science and a strong interest in electron microscopy.

Project Details and Location: The project will be carried out as a collaboration between Prof Joanne Etheridge (Monash University), Dr Alison Funston (Monash University) and Prof. Paul Mulvaney (The University of Melbourne). The position will be situated at Monash University, Melbourne.

Selection Criteria

Essential

- BSc(Hons), MSc or equivalent with CGPA > 85% in physics, chemistry or materials science;
- 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 electron microscopy (TEM).
- Experience in nanocrystal chemical synthesis, purification and characterization.
- Experience in optical instrumentation and measurements.

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

Start Date Available now.

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