

PhD Scholarship

- Centre for Quantum and Technology Theory
- Full-time, 2-year position at Swinburne University of Technology
- Stipend of \$33,500 p.a.

About the Scholarship

We are seeking a PhD student to join an ongoing project funded by the Australian Research Council, under the supervision of Prof. Xia-Ji Liu. The research will be conducted at the Centre for Quantum Technology Theory (CQTT). This full-time PhD scholarship is available for a duration of three years.

Polaritons, known as quantum fluids of light, are unique particles that are half-light and half-matter, exhibiting superfluidity—frictionless flows with zero energy cost. This project aims to advance our understanding of polaritons in the strongly interacting regime far from equilibrium, addressing the knowledge gap needed to achieve room-temperature superfluid light. This breakthrough is expected to usher in a new era of quantum polaritonics, laying the groundwork for energy-efficient lasers and all-optical transistors, and positioning Australia as a global leader in the commercialization of innovative photonic technologies.

The project will open a new direction in the studies of quantum polaritons by addressing several challenge topics,

- Determining the polariton-polariton interaction strength,
- Clarifying the non-equilibrium phase diagram of polaritons at very strong light-matter coupling,
- Exploring emergent quasiparticles of polariton-polarons in the highly imbalanced condition.

About you

To be successful in the role, you will have:

- Mater or Honours
- Theoretical background in ultracold quantum gases and condensed matter physics
- Demonstrated experience in numerical simulations
- A valid working with children's check card (or ability to obtain prior to or upon commencement).

A full list of selection criteria is available within the position description.

How to apply and further information

Please submit your CV and cover letter addressing why you believe you are suitable for this position.

For further information about this position, contact **Professor, Xia-Ji Liu** at xiajiliu@swin.edu.au

Applications Close: Sunday 15th September 2024 at 11pm.