

Session Program

30 November 2025 to 5 December 2025



AIP summer meeting 2025

Quantum Science and Technology

Building 40, Hope Theatre
University of Wollongong Northfields Avenue Wollongong NSW 2522

Tuesday 2 December

10:40

Quantum Science and Technology

Session |

Location: Building 40, Hope Theatre, University of Wollongong Northfields Avenue Wollongong NSW 2522

10:40–11:10

Quantum circuits as a tool in materials science: using imperfect devices to build better quantum technology

Speaker

Jared Cole

11:10–11:25

Logical channel for heralded and pure loss with the Gottesman-Kitaev-Preskill code

Speaker

Tom Harris

11:25–11:40

Q-PUF: Scalable, Hardware-Based Authentication for Quantum Processors

Speaker

Dr Behnam Tonekaboni

11:40–11:55

Noise mitigation of Quantum Circuits using Fictitious Copies

Speaker

Akib Karim

11:55–12:10

Classical simulation of noisy quantum circuits via locally entanglement-optimal unravelings

Speaker

Dr Hakop Pashayan

12:10–12:25

Identifying quantum chaos using rigorous statistics and random matrix theory

Speaker

Nathan Langford

12:25–12:40

Quantum State Preparation using Dynamical Invariants and Machine Learning

Speakers

Ritik Sareen, Dr Akram Youssry

12:40

16:30

Quantum Science and Technology

Session |

Location: Building 40, Hope Theatre, University of Wollongong Northfields Avenue Wollongong NSW 2522

16:30–17:00

Quantum-enabled optical large-baseline interferometry: applications, protocols and feasibility

Speaker

Zixin Huang

17:00-17:15

Collectively-pumped superradiant laser with coherence scaling beyond the standard quantum limit**Speaker**

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17:15-17:30

Exact Spectral Properties of Fermi Polarons in One-Dimensional Lattices: Anomalous Fermi Singularities and Polaron Quasiparticles**Speaker**

Dr Hui Hu

17:30-17:45

Molecular optomechanics with atomic antennas**Speaker**

Mikolaj Schmidt

17:45-18:00

Optical-microwave quantum state transduction beyond the ideal**Speaker**

James Bainbridge

18:00-18:15

Exponentially Enhanced Laser Coherence through Cascaded Cavities**Speaker**

Dr Giacomo Pantaleoni

18:15-18:30

Electromagnetically-induced transparency assists the Raman gradient echo memory at moderate detuning, dependent on gradient order**Speaker**

Aaron Tranter

18:30

Wednesday 3 December

10:45

Quantum Science and Technology

Session |
Location: Building 40, Hope Theatre, University of Wollongong Northfields Avenue Wollongong NSW 2522

10:45-11:15
"Atomtricity" the world of matter wave circuitry for precision sensing and signal processing
Speaker
Dana Anderson

11:15-11:30
Multi-time quantum process tomography--and beyond--on superconducting qubits
Speaker
Christina Giarmatzi

11:30-11:45
Resource efficient multi-time process tomography using superinstruments
Speaker
Abhinash Roy

11:45-12:00
Quantum Signal Processing Interferometry: Detecting Rare Events at the Single-Shot Limit
Speaker
Mr Frank Scuccimarra

12:00-12:15
Tunable qubit-cavity gates for digital quantum simulations in circuit QED
Speaker
Angsar Manatuly

12:15-12:30
Engineered Dissipation in Digital Quantum Simulations for Complex Resource State Generation
Speaker
Adrien Di Lonardo

12:30-12:45 Tunable λ -system to detect timelike Unruh effect
Speaker
Dr Pravin Kumar Dahal

12:45

Thursday 4 December

10:40

Quantum Science and Technology

Session |

Location: Building 40, Hope Theatre, University of Wollongong Northfields Avenue Wollongong NSW 2522

10:40–10:55

Quantum Entanglement as a Resource for Secure Navigation

Speaker

Rakhitha Chandrasekara

10:55–11:10

Quantum Engineering of Qudits with Interpretable Machine Learning

Speakers

Yule Mayevsky-Mattiaccio, Akram Youssry, Mr Ritik Sareen

11:10–11:25

Integrating gate-defined quantum dots with nuclear spin qudits in silicon

Speaker

James Zingel

11:25–11:40

Spectroscopy with Undetected Photons for Biomedical Diagnostics in Mid-Infrared

Speaker

MAHYA MOHAMMADI

11:40–11:55

Quantum imaging of living cells with bright squeezed light

Speaker

alex terrasson

11:55–12:10

Enhanced Optomechanical Cooling In Brillouin Waveguides Using Squeezed Light

Speaker

Adem Ozer

12:10–12:25

Engineering tunable anharmonic potentials with light-atom interaction for chemical dynamics simulations

Speaker

Cameron McGarry

12:25–12:40

Ballistic Optical Tweezers for Measuring Fast Protein-Receptor Binding Dynamics

Speaker

Jackson Lucas

12:40

13:40

Quantum Science and Technology

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13:40–13:55

Classical Approximate Algorithms for Gaussian Boson Sampling: Has quantum advantage been achieved?

Speaker

Ned Goodman

13:55–14:10

A bivariate bicycle code architecture for quantum communication using ion traps

Speaker

Anthony O'Rourke

14:10–14:25

Transient Coherence Dynamics of Trapped Exciton-Polariton Condensates

Speaker

Ms Bianca Rae Fabricante

14:25–14:40

Development of a Hybrid Optical-Electrical trap for levitated nanoparticles for quantum sensing and fundamental science

Speaker

Samuel McNeil

14:40–14:55

Demonstrating single-ion addressing of dynamic 2D ion crystals for quantum simulation

Speaker

Nihar Makadia

15:10

16:10

Quantum Science and Technology

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16:10–16:25

Quadratically coupling DV detectors with QFT: tools for non-perturbative modelling of CV-DV hybrid systems

Speaker

Nicholas Funai

16:25–16:40

Cryogenic Memory Elements Using Rare-Earth Nitride Thin Films

Speaker

Dr Catherine Pot

16:40–16:55

Moments-based ground-state energy estimation for pre-fault tolerant quantum hardware and beyond

Speaker

Michael Jones

16:55-17:10

Quantum phase estimation with optimal confidence interval using three control qubits**Speaker**

Kaur Kristjuhan

17:10-17:25

Validation tests of Gaussian boson samplers with photon-number resolving detectors**Speaker**

Alexander Delliös

17:25-17:40

Resource estimates for the open-system simulation of chemical reactions**Speaker**

Soumya Sarkar

17:40-17:55

Electromagnetic helicity in twisted cavity resonators**Speaker**

Emma Paterson

17:55-18:10

Quantum Approaches to Biomedicine: Hybrid Algorithms and Rydberg-Atom Sensing**Speaker**

Dr Teague Tomesh

18:10

Friday 5 December

10:40

Quantum Science and Technology

Session |**Location:** Building 40, Hope Theatre, University of Wollongong Northfields Avenue Wollongong NSW 2522

10:40–10:55

Grand Unification of All Discrete Wigner Functions on $d \times d$ Phase Space

Speaker

Lucky Antonopoulos

10:55–11:10

Quantum Fast Multipole Method

Speaker

Dominic Berry

11:10–11:25

Engineering continuous-variable entanglement in mechanical oscillators with optimal control

Speaker

Maverick Millican

11:25–11:40

Superfluidity with Penetrable Obstacles

Speaker

Charlotte Thomson

11:40–11:55

Using coherence as a resource in a two-mode BEC thermal quantum engine

Speaker

Sukhmandeep Singh Baath

11:55–12:10

Precision Bounds for Characterising Quantum Measurements

Speaker

Aritra Das

12:40