EQUS Autumn School 2024

7–9 May 2024
Peppers Noosa

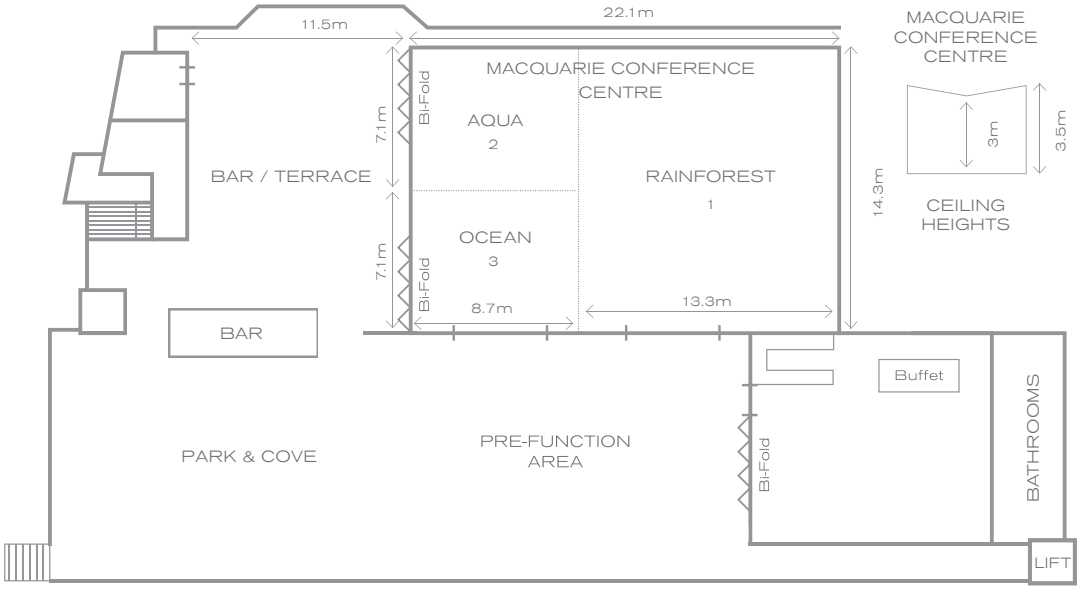
33A Viewland Drive
Noosa Heads QLD
Rainforest Room

EQUS
Australian Research Council
Centre of Excellence for
Engineered Quantum Systems

Timetable overview

	Breakfast	Check-in/out	Start	End	Dinner/social
Day 1: Tuesday 7 May		3:00 pm	4:00 pm	5:30 pm	6:00 pm
Day 2: Wednesday 8 May	7:00 am		9:00 am	4:30 pm	5:30 pm
Day 3: Thursday 9 May	7:00 am	8:00 am	8:30 am	3:15 pm	

Floor plan



Instagram: @engineeredquantumsystems | Twitter (X): @ARC_EQUS
equs.org | #teamEQUS | #EQUSAutumnSchool

EQUS acknowledges the Traditional Custodians and Cultures of the lands and waters on which we live and work. We pay our respects to all First Nations Peoples, Elders and Ancestors. We acknowledge that sovereignty was never ceded and stand in solidarity towards a shared future.

When we acknowledge Country, one of things we're doing is honouring and respecting the long tradition of knowledge-making in First Nations cultures, including in the STEM disciplines of science, technology, engineering and maths.

In particular, we acknowledge the Kabi Kabi/Gubbi Gubbi People as the Traditional Owners of the Noosa Shire area, and the area north to K'Gari, south to Pumicestone Passage and west to the Conondale and Blackall ranges.

It always was and always will be Aboriginal land.

Day 1: Tuesday 7 May

10:00 am	Bus departure: UQ to Peppers Noosa (via Brisbane Airport)
10:30 am	Bus departure: Brisbane Airport to Peppers Noosa
10:40 am	Bus departure: Sunshine Coast Airport to Peppers Noosa
3:00 pm–4:00 pm	Registration (outside Rainforest Room) and check-in
4:00 pm–4:30 pm	**Welcome**
4:30 pm–5:30 pm	**Keynote presentation: Arnan Mitchell** **Emerging platforms for photonic integrated circuits**

Professor Arnan Mitchell is a Distinguished Professor in the School of Engineering at RMIT University, Director of the RMIT Micro Nano Research Facility (MNRF) and Director of the recently announced ARC Centre of Excellence for Optical Microcombs for Breakthrough Science (COMBS). He has published more than 700 research papers, including in *Science*, *Nature*, *Nature Medicine* and *Nature Photonics*. He is a senior member of the IEEE and SPIE, and a Fellow of Optica. He is a highly multidisciplinary researcher working in microchip technologies that combine light, sound, fluids and electronics, with applications spanning radar systems for defence, high-speed fibre-optic communications and point-of-care diagnostic systems for biomedicine. He is enthusiastic about translating technology into the hands of end-users and has dedicated much of his career to building and training diverse teams and building comprehensive micro- and nanotechnology infrastructure to enable breakthrough discoveries to achieve real-world impact.

5:30 pm–6:00 pm	Free time
6:00 pm–7:00 pm	**Dinner** Peppers food station, pre-function area
7:00 pm–8:30 pm	**Social event** Rainforest room

Day 2: Wednesday 8 May

7:00 am–9:00 am Breakfast (buffet area)

9:00 am–10:00 am **Lectorial: Daniel Peace**

Introduction to nanofabrication 1

Dr Daniel Peace is an EQUS Research Fellow at UQ, currently focused on the development of integrated photonics devices for classical and quantum information processing. Daniel has worked with several photonics platforms, including silicon-on-insulator, silicon nitride and lithium niobate, for various quantum technologies. He has a keen interest in developing and refining nanofabrication and electron-beam lithography techniques to improve the performance of photonic integrated circuits.

10:00 am–10:30 am Morning tea (pre-function area)

10:30 am–11:30 am **Lectorial: Erick Romero**

Introduction to nanofabrication 2

Dr Erick Romero received his PhD from UQ, which is where he was first introduced to the world of fabrication, and is a former EQUS Research Fellow. His PhD focused on the origins of nanomechanical dissipation and developing a nanomechanical circuitry platform. As a Research Fellow, his research expanded to high-precision photonic sensors, nanomechanical computing and nano-electromechanical systems. He further developed his nanofabrication skills during his time at the Australian National Fabrication Facility. Now in industry, Erick supports the fabrication and development of deep-UV LEDs at one of the largest Australian semiconductor companies, Silanna Semiconductor.

11:30 am–12:00 pm **Q&A**

12:00 pm–1:00 pm Lunch (pre-function area)

1:00 pm–2:00 pm **Lectorial: Till Weinhold**

Single photonic devices and systems

Before joining DSTG, Dr Till Weinhold was an EQUS Research Fellow, working at UQ with EQUS Director Andrew White on single-photon quantum technologies and nanophotonic circuits for quantum optics. He collaborated with researchers at ANU in the demonstration of an integrated single-photon source and quantum memory system towards realising a quantum repeater. Together with researchers at UWA, Till participated in the Army Quantum Technology Challenge in 2019/20 as teamEQUS.

2:00 pm–2:30 pm Afternoon tea (pre-function area)

2:30 pm–4:30 pm **On-chip photonic sensing workshop**

4:30 pm–5:30 pm Free time

5:30 pm–7:00 pm **Dinner**

Noosa Surf Club, 69 Hastings Street

Day 3: Thursday 9 May

7:00 am–8:30 am	Breakfast (buffet area) & check-out
8:30 am–9:30 am	**Lectorial: Chris Baker** **Opto/electromagnetic sensing**

Dr Chris Baker is an experimental physicist, UQ Amplify Fellow and EQUS Research Fellow at UQ, with more than a decade of experience in micro- and nanofabrication, including in integrated photonics, micro-electromechanical systems (MEMS), optomechanics, superfluid physics and nanomechanics. He received his PhD from the University of Paris for work in the field of cavity optomechanics. Read more about his research and access his latest publications at http://www.christophergbaker.com/.

9:30 am–10:30 am	**Lectorial: Xanthe Croot** **Superconducting circuits**

Dr Xanthe Croot is an experimental physicist, EQUS Chief Investigator and director of the Superconducting Quantum Circuits Laboratory at USYD. Her research focuses on superconducting and hybrid semi-superconducting platforms for quantum computing. Xanthe completed her PhD in semiconductor spin qubits as an EQUS PhD student at USYD in 2018. As a postdoctoral Dicke Fellow at Princeton University, she worked on hybrid semi-superconducting implementations of quantum computing and novel protected qubits in superconducting circuits. Xanthe's research interests include protected qubits, spin-based quantum information and hybrid devices.

10:30 am–11:00 am	Morning tea (pre-function area)
11:00 am–12:00 pm	**Lectorial: Markus Rambach** **Neuromorphic systems**

Dr Markus Rambach is a Senior Research Fellow at UQ and an EQUS Associate Investigator. He has worked in research groups in Austria, Australia and the UK. Markus has a strong background in experimental photonic quantum information, focusing on engineering and developing single-photon sources (quantum dots, SPDC sources) and higher-dimensional quantum systems (qudits) with spatial modes of light for quantum communications and information. Recently, he has moved his focus to quantum and classical integrated photonics, to implement quantum algorithms and their use in energy-efficient neuromorphic computing platforms. He is also enthusiastic about public outreach and creating a diverse, inclusive and safe environment for everyone.

12:00 pm–12:45 pm	Lunch (pre-function area)
12:45 pm–2:15 pm	**Q&A panel**
2:15 pm–2:45 pm	**Conclusion**
2:45 pm–3:00 pm	Afternoon tea (pre-function area)
3:05 pm	Bus departure: Peppers Noosa to Sunshine Coast Airport
3:15 pm	Bus departure: Peppers Noosa to UQ, via Brisbane Airport