ACAN neuroscience

Australasian Neuroscience Society

Australasian Course in Advanced Neuroscience

2026 Course Program

- Neurons to Networks
- Networks to Systems
- Systems to Behaviour

UNSW SYDNEY

INTERNATIONAL BRAIN IBRO RESEARCH ORGANIZATION

Neurological Foundation
A pathway to hope

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COURSE **SITE MAP** & **COMMUTE**

ACAN (Wallace Wurth building)

Entry vial UNSW **Gate 10**

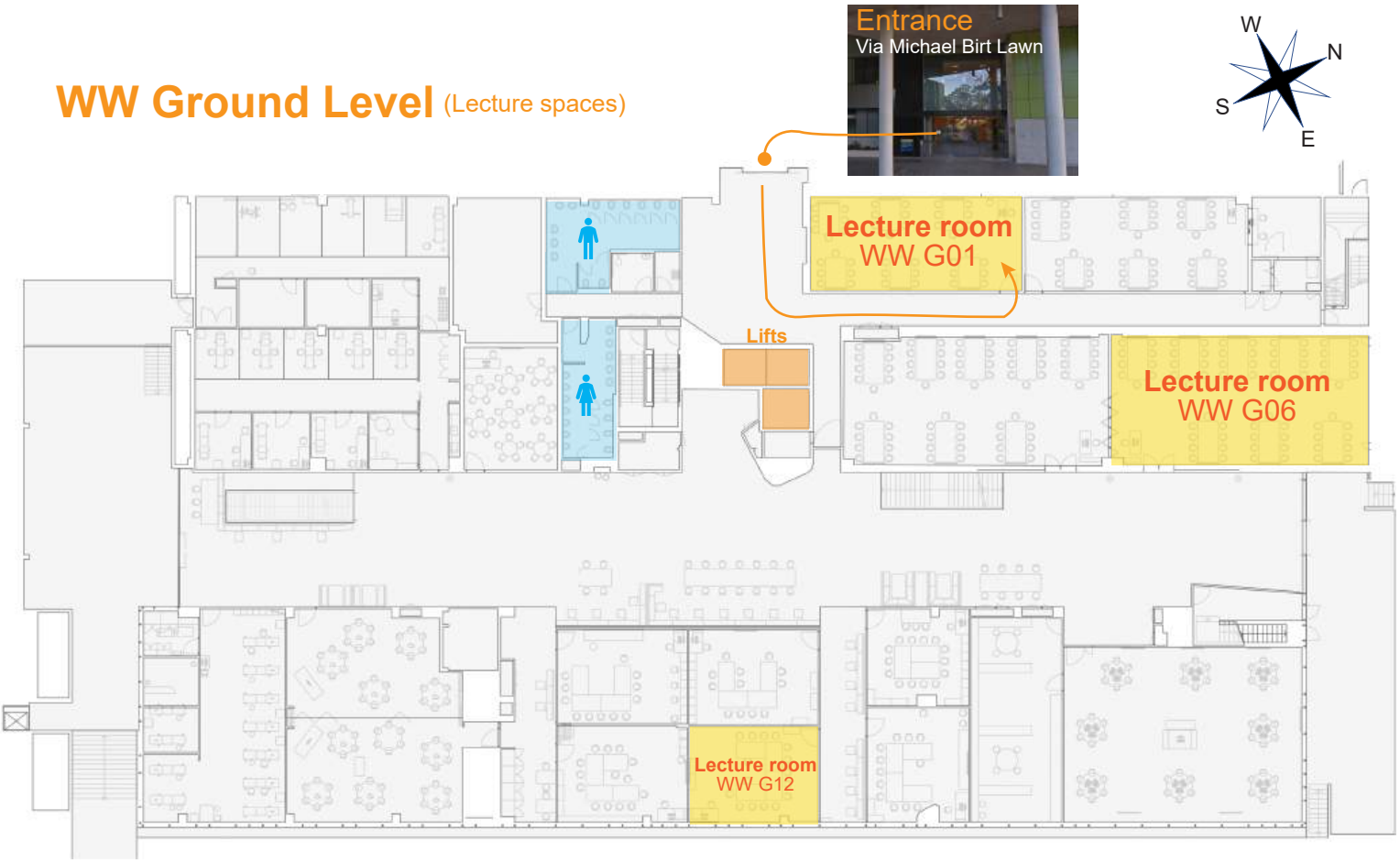
Sydney Lodges (Perouse Randwick)

Entry via **Perouse Road**

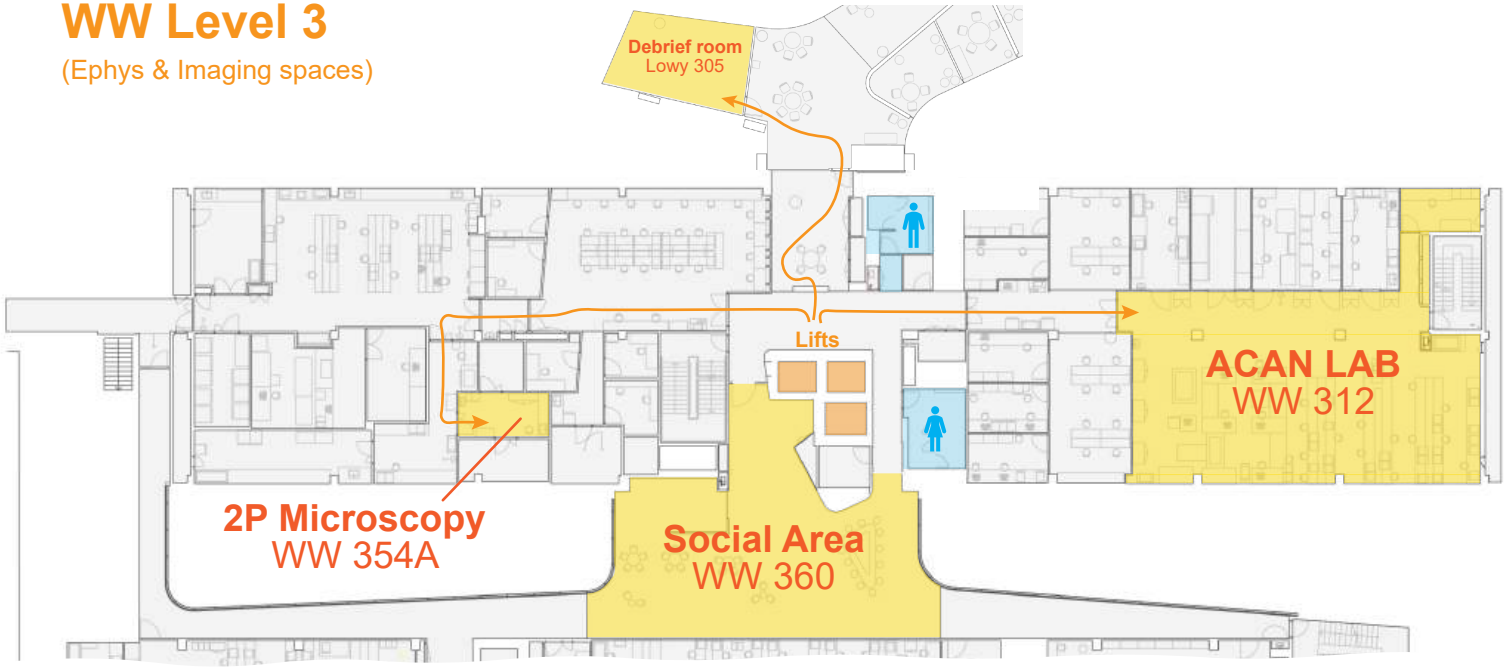
Coogee beach (follow Coogee beach Rd)

FLOOR PLAN
Wallace Wurth building (WW)

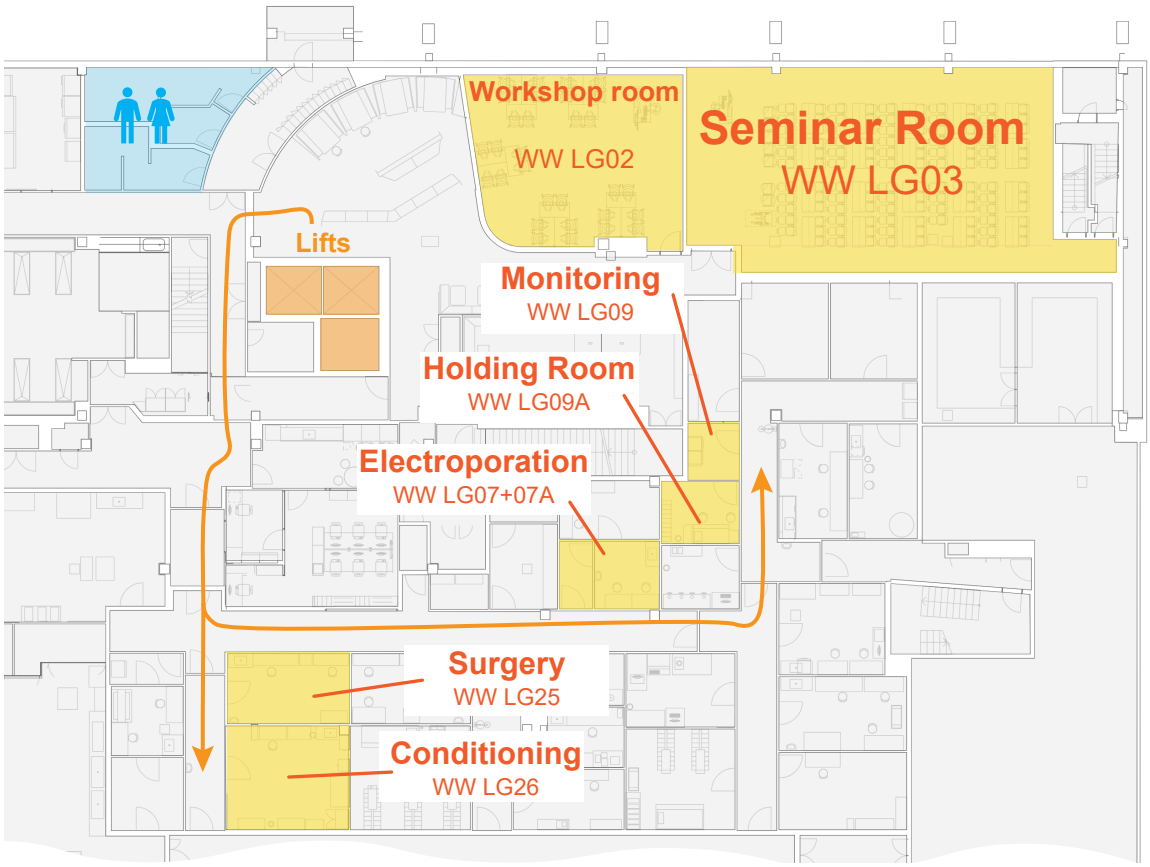
WW Ground Level (Lecture spaces)



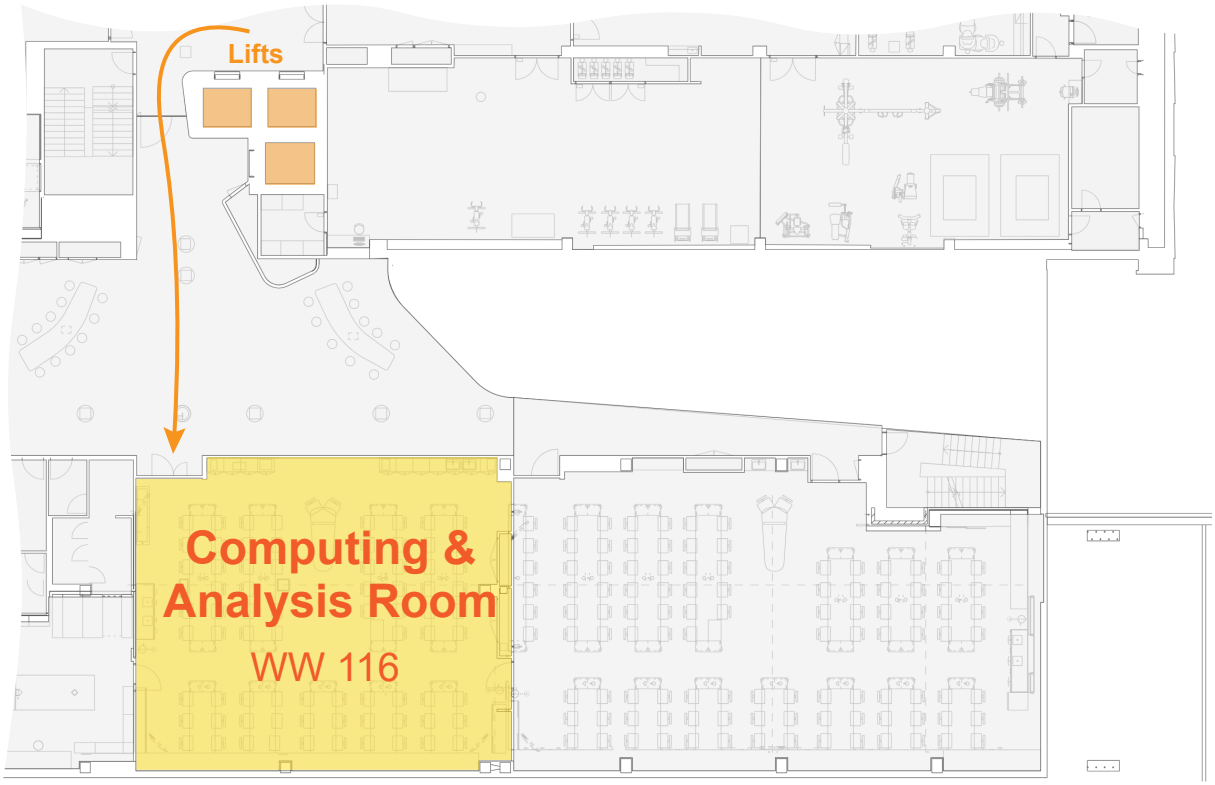
WW Level 3
(Ephys & Imaging spaces)



WW Lower Ground (Evening Lectures, Behaviour & Surgery spaces)



WW Level 1 (Computing and Analysis space)



Welcome | Sunday 10 MAY

EVENING SESSION — The Avenue, Randwick
2 The Avenue, Randwick, NSW 2031

17:00 – 21:00 — Welcome Drinks & Dinner
(outdoor picnic space)

Attendees include:

ACAN Students	
ACAN Faculty	*Lab instructors and speakers*
John Bekkers	*Former ACAN Director*
Stephen Williams	*Former ACAN Director*
Jay Bertran-Gonzalez	*Course Director*
Lee Fletcher	*Co-director*
Christina Mo	*Co-director*
John Power	*Co-director*
Greg Stuart	*ACAN Chair*

THEME 1 | NEURONS to NETWORKS

Monday 11 MAY — FUNDAMENTALS OF ELECTROPHYSIOLOGY

07:30 – 08:15	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G12)
08:30 – 09:00	Introduction to Theme **Lee Fletcher** | *Monash University* (VIC)
09:00 – 10:15	The Golden Rules of Electrophysiology **John Bekkers** | *Eccles Institute of Neuroscience ANU* (ACT)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G12)
10:45 – 12:00	Practical Aspects of Patch Clamp Recordings **Lee Fletcher** | *Monash University* (VIC)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Lab (WW 312)
13:00 – 13:30	Pre-Lab Debrief (Lowy 305) | **Cherry Mao** (Florey VIC), **Alex Tang** (UWA WA), **Ben Lau** (UNSW NSW), **Tobias Bluett** (UQ QLD), **Bryony Winters** (USyD NSW), **Lee Fletcher** (Monash VIC)
14:00 – 18:00	Lab: Meeting the rigs | *All groups*
EVENING WORKSHOPS	ACAN Lab (WW 317)
15:00 – 18:00	Neuro-Electronics Workshop | *Group A* **Ian Forster** | *Florey Institute of Neuroscience* (VIC)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Meeting Room (Lowy 305)
19:30 – 22:00	Student Presentations

Tuesday 12 MAY — BUILDING BLOCKS OF NEURONS

07:30 – 07:55	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G06)
09:00 – 10:15	The Electrical Structure of The Neuron **Greg Stuart** | *Monash University* (VIC)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G06)
10:45 – 12:00	Voltage-gated Ion Channels and Excitability **Bill Connelly** | *University of Tasmania (*TAS)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Lab (WW 312)
13:00 – 13:30	Pre-Lab Debrief (Lowy 305)| **Cherry Mao** (Florey VIC), **Alex Tang** (UWA WA), **Ben Lau** (UNSW NSW), **Tobias Bluett** (UQ QLD), **Bryony Winters** (USyD NSW), **Lee Fletcher** (Monash VIC)
13:30 – 18:00	Lab: Current and voltage relationships in neurons | *All groups*
EVENING WORKSHOPS	ACAN Lab (WW 317)
15:00 – 18:00	Neuro-Electronics Workshop | *Group B* **Ian Forster** | *Florey Institute of Neuroscience* (VIC)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	ACAN Lab (WW 312)
19:30 – Late.	Lab After-hours | *All groups*

THEME 1 | NEURONS to NETWORKS

Wednesday 13 MAY — NEURONAL COMMUNICATION

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G01)
09:00 – 10:15	Axons and Signal Transmission **Maarten Kole** | *Netherlands Institute for Neuroscience and Utrecht University* (Netherlands)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G01)
10:45 – 12:00	Neurotransmission and Synaptic Function **Karl Iremonger** | *University of Otago* (NZ)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Lab (WW 312)
13:00 – 13:30	Pre-Lab Debrief (Lowy 305)| **Cherry Mao** (Florey VIC), **Alex Tang** (UWA WA), **Ben Lau** (UNSW NSW), **Tobias Bluett** (UQ QLD), **Bryony Winters** (USyD NSW), **Lee Fletcher** (Monash VIC)
13:30 – 18:00	Lab: Action potential dynamics | *All groups*
EVENING WORKSHOPS	ACAN Lab (WW 312)
15:00 – 18:00	*In Vivo* Recording Workshop **Saba Gharaei** | *Eccles Institute of Neuroscience, ANU* (ACT)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	ACAN Lab (WW 312)
19:30 – Late.	Lab After-hours | *All groups*

Thursday 14 MAY — SYNAPTIC PLASTICITY

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G01)
09:00 – 10:15	Synaptic Dynamics, Plasticity, and Modulation **Elena Bagley** | *University of Sydney (NSW)*
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G01)
10:45 – 12:00	Neuronal Mechanisms of Learning and Memory **Christine Grienberger** | *Brandeis University* (Massachusetts, USA)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Lab (WW 312)
13:00 – 13:30	Pre-Lab Debrief (Lowy 305)| **Cherry Mao** (Florey VIC), **Alex Tang** (UWA WA), **Ben Lau** (UNSW NSW), **Tobias Bluett** (UQ QLD), **Bryony Winters** (USyD NSW), **Lee Fletcher** (Monash VIC)
13:30 – 18:00	Lab: Excitatory and Inhibitory Synaptic Potentials | *All groups*
EVENING WORKSHOPS	ACAN Lab (WW 312)
15:00 – 18:00	*In Vivo* Recording Workshop **Saba Gharaei** | *Eccles Institute of Neuroscience, ANU* (ACT)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Wallace Wurth Seminar Room (WW LG03)
19:30 – 20:30	*Special Lecture* Circuit Mechanisms Underlying Behavioural Timescale Synaptic Plasticity **Christine Grienberger** | *Brandeis University* (Massachusetts, USA)
20:30 – Late.	Post Lecture Discussion / Lab

THEME 1 | NEURONS to NETWORKS

Friday 15 MAY — NEURONAL OPERATION

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G12)
09:00 – 10:15	Dendritic Integration **Stephen Williams** | *Monash University* (VIC)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G12)
10:45 – 12:00	*In Vivo* Patch Clamp and recording techniques **Saba Gharaei** | *Eccles Institute of Neuroscience ANU* (ACT)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Lab (WW 312)
13:00 – 13:30	Pre-Lab Debrief (Lowy 305)| **Cherry Mao** (Florey VIC), **Alex Tang** (UWA WA), **Ben Lau** (UNSW NSW), **Tobias Bluett** (UQ QLD), **Bryony Winters** (USyD NSW), **Lee Fletcher** (Monash VIC)
13:30 – 18:00	Lab: Neural Circuits | *All groups*
EVENING WORKSHOPS	ACAN Lab (WW 312)
15:00 – 18:00	*In Vivo* Recording Workshop | *Group 2* **Saba Gharaei** | *Eccles Neuroscience Institute* (ACT)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	ACAN Lab (WW 312)
19:30 – Late.	Lab After-hours | *All groups*

THEME 1 | NEURONS to NETWORKS

Saturday 16 MAY — NEURONAL FUNCTION

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (G01)
09:00 – 10:15	Neural Coding and Information Theory **Ehsan Arabzadeh** | *Eccles Institute of Neuroscience ANU* (ACT)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (G01)
10:45 – 12:00	Pre-Lab Debrief and Lab setup | **Cherry Mao** (USyd NSW), **Alex Tang** (UWA WA), **Ben Lau** (UNSW NSW), **Tobias Bluett** (Monash VIC), **Bryony Winters** (USyD NSW), **Lee Fletcher** (Monash VIC)
12:00 – 13:00	Lunch (Social area – WW 360)
AFTERNOON PRAC	ACAN Lab (WW 312)
13:00 – 18:00	Lab: Paired / Dendritic recordings | *All groups*
EVENING WORKSHOPS	ACAN Lab (WW 312)
15:00 – 18:00	*In Vivo* Recording Workshop | *Group 3* **Saba Gharaei** | *Eccles Neuroscience Institute* (ACT)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Science at the Pub (The Royal Randwick)
19:30 – 20:30	*Special Lecture* How Bright Is This Beer? Primate Retina Brightness Coding from High-Density MEAs to Spatial Omics **Ben Sivyer** | *Casey Eye Institute* (Oregon, USA)
20:30 – Late	Post Lecture Discussion / Drinks

Sunday 17 MAY — FREE DAY ACTIVITY

THEME 2 | CIRCUITS to NETWORKS

Monday 18 MAY — MEASURING NEURAL FUNCTION WITH LIGHT

07:30 – 08:15	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G01)
08:30 – 09:00	Intro to Theme **Christina Mo** | *Florey* (VIC) & **John Power** | *UNSW Sydney* (NSW)
09:00 – 10:15	Fundamentals of Optics & Microscopy **Michael Carnell** | *UNSW Sydney* (NSW)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G01)
10:45 – 12:00	Neuronal Calcium Signalling **John Power** | *UNSW Sydney* (NSW)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Lab (WW 312) or Animal Facility
13:00 – 13:30	Pre-Lab Debrief (**Lowy 305**)| *All groups* **John Power** (*UNSW* NSW), **Dennis Cheung** (*NIPS* Japan), **Michel Herde** (*Otago* NZ), **Sophia Gilchrist** (*USyD* NSW), **Laura McNamara** (Auckland, NZ), **Si Yin Lui** (*UNSW* NSW) & **Billy Chieng** (UNSW NSW)
13:30 – 15:30	Ca^{2+} Imaging in Brain Slices | *Group A* Headplate Surgery | *Groups B*
15:30 – 18:00	Headplate Surgery | *Groups Group A* Ca^{2+} Imaging in Brain Slices | *Groups B*
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	ACAN Lab (WW 312) | Meeting room (Lowy 305)
19:30 – Late.	Using Image J, Lab After-hours: back at the rig! | *All groups*

Tuesday 19 MAY — CONTROLLING NEURAL FUNCTION WITH LIGHT

07:30 – 07:55	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G01)
09:00 – 10:15	How to Probe Neuronal Circuits and Networks **Christina Mo** | *Florey Institute of Neuroscience* (VIC)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G01)
10:45 – 12:00	Advances in Optogenetics **John Lin** | *University of Tasmania* (TAS)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Lab (WW 312) or TNF (WW 354A)
13:00 – 13:30	Pre-Lab Debrief (Lowy 305)| *All groups* **John Power** (*UNSW* NSW), **Dennis Cheung** (*NIPS* Japan), **Michel Herde** (*Otago* NZ), **Sophia Gilchrist** (*USyD* NSW), **Laura McNamara** (Auckland, NZ), **Si Yin Lui** (*UNSW* NSW) & **Billy Chieng** (UNSW NSW)
13:30 – 18:00	Optogenetics or Ca^{2+} Imaging in Brain Slices | *Group A* Cranial Window Surgery (TNF) | *Group B*
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	ACAN Lab (WW 312)
19:30 – Late.	Lab After-hours | *All groups*

THEME 2 | CIRCUITS to NETWORKS

Wednesday 20 MAY — A WINDOW TO NEURAL FUNCTION

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G01)
09:00 – 10:15	Molecular Mechanisms of Synaptic Function **Victor Anggono** | *Queensland Brain Institute* (QBI)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G01)
10:45 – 12:00	How to Investigate Peripheral Circuits **Johanna Montgomery** | *University of Auckland* (NZ)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Lab (WW 312) or TNF (WW 354A)
13:00 – 13:30	Pre-Lab Debrief | *All groups* **John Power** (*UNSW* NSW), **Dennis Cheung** (*NIPS* Japan), **Michel Herde** (*Otago* NZ), **Sophia Gilchrist** (*USyD* NSW), **Laura McNamara** (Auckland, NZ), **Si Yin Lui** (*UNSW* NSW) & **Billy Chieng** (UNSW NSW)
13:30 – 18:00	Optogenetics or Ca^{2+} imaging in brain slices | *Group B* Cranial Window Surgery (TNF) | *Group A*
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Wallace Wurth Seminar Room (WW LG03)
19:30 – 20:30	*Special Lecture* Diamond Voltage Imaging Microscopy **David Simpson** | *University of Melbourne* (VIC)
20:30 – Late.	Post Lecture Discussion

Thursday 21 MAY — FUNCTIONAL IMAGING IN WHOLE SYSTEMS (I)

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G01)
09:00 – 10:15	Light-sheet Imaging of Whole Brain Networks in Zebra Fish **Ethan Scott** | *University of Melbourne* (VIC)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G01)
10:45 – 12:00	Using Brain Organoids to Model Disease **Lezanne Ooi** | *University of Wollongong* (NSW)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	Imaging Labs (TNF | ACAN Lab | Katharina Gaus Facility)
13:00 – 13:30	Pre-Lab Debrief | *All groups*
13:30 – 18:00	*Group rotations (groups X, Y, Z)* 2P Imaging Head-fixed Mouse **Dennis Cheung** (*NIPS* Japan) & **Christina Mo** (*Florey* VIC) Dendritic Imaging **KGLMF staff** | *UNSW Sydney* (NSW) & **Michel Herde** (*Otago* NZ) Multi-Electrode Arrays **Lezanne Ooi** (Wollongong NSW) & **Albert Steiner** *3Brain AG* (Switzerland)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	
19:30 – 21:30	*Group rotations (continued)*

Friday 22 MAY — FUNCTIONAL IMAGING IN WHOLE SYSTEMS (II)

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G01)
09:00 – 10:15	Holographic Microscopy **Vince Daria** | *Australian National University* (ACT)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G01)
10:45 – 12:00	Analysing Neural Populations **Clarissa Whitmire** (*QBI* QLD)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Computing Lab (WW 116)
	Analysing Population Data
13:00 – 16:00	2P Image Analysis **Clarissa Whitmire** (*QBI* QLD) & **Christina Mo** (*Florey* VIC)
16:30 – 18:00	MEA Analysis Pipeline **Lezanne Ooi** (Wollongong NSW) **& Albert Steiner** *3Brain AG* (Switzerland)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	ACAN Computing Lab (WW 116)
19:30 – 21:00	MEA Analysis (continued) **Lezanne Ooi** (Wollongong NSW) **& Albert Steiner** *3Brain AG* (Switzerland)

Saturday 23 MAY — WRAP UP!

07:30 – 08:45	Breakfast (Perouse Randwick)
MORNING	ACAN Computing Lab (WW 116) | Lecture Room (G01)
09:00 – 12:00	Data Analysis | *All Groups* **Clarissa Whitmire** (*QBI* QLD) & **Christina Mo** (*Florey* VIC) **Michel Herde** (*Otago* NZ), **John Power** (*UNSW* NSW) **Albert Steiner** *3Brain AG* (Switzerland)
12:00 – 13:00	Lunch (Social area – WW 360)
AFTERNOON	Lecture Room (G01)
13:00 – 15:00	Data Analysis | *All Groups*
16:00 – 18:00	Student Presentations | *All students*
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Wallace Wurth Seminar Room (WW LG03)
19:30 – 20:30	*Special Lecture* Manipulating Neuron-Glia Interactions Holographically **Hiro Wake** | *National Institute for Physiological Sciences (Japan)*
20:30 – Late.	Post Lecture Discussion

Sunday 24 MAY — FREE DAY ACTIVITY

THEME 3 | SYSTEMS to BEHAVIOUR

Monday 25 MAY — LEARNING & BEHAVIOUR

07:30 – 08:15	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G12)
08:30 – 09:00	Intro to Theme **Jay Bertran-Gonzalez** | *UNSW Sydney* (NSW)
09:00 – 10:15	Associative Learning and Behaviour **Nathan Holmes** | *UNSW Sydney* (NSW)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G12)
10:45 – 12:00	Interrogating Neural Systems Function with Behaviour **Karly Turner** | *UNSW Sydney* (NSW)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	Lecture Room | Computing Lab | Behaviour Lab
13:00 – 18:00	Designing our Behavioural Experiment | *Rotations* | WW LG03 **Jay Bertran-Gonzalez** (*UNSW* NSW) Controlling a Conditioning Rig | *Rotations* | WW LG02 **Karly Turner** & **Beatrice Leung** (*UNSW* NSW) Meet Your Mouse & Training Day 1 | *Rotations* | WW LG26 **Chelsea Goulton** (*UNSW* NSW) & **Leigh Walker** (*Florey* VIC)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Wallace Wurth Seminar Room (WW LG03)
19:30 – 20:30	*Special Lecture* Neuroscience of Associative Learning **Mihaela Iordanova** | *Concordia University* (CAN)
20:30 – Late.	Post Lecture Discussion

THEME 3 | SYSTEMS to BEHAVIOUR

Tuesday 26 MAY — SETTING UP BRAIN SYSTEMS

07:30 – 07:55	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G06)
09:00 – 10:15	Investigating Brain Structure and Function at the Macroscale **Dylan Black** | *University of Queensland* (QLD)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G06)
10:45 – 12:00	Studies of Neurogenesis and Neural Circuit Formation **Annalisa Paolino** | *University of Queensland* (QLD)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Computing Lab | Behaviour Lab
13:00 – 18:00	Training Day 2 | *All Groups* | WW LG26 **Jay Bertran-Gonzalez** (*UNSW* NSW) **& Beatrice Leung** (*UNSW* NSW)
	Prac 3_1 | *In Utero* Electroporation | *Group 1* | WW LG07 **Annalisa Paolino** (*UQ* QLD) **& Dylan Black** (*UQ* QLD)
	Prac 3_2 | Advanced Behaviour | *Group 2* | WW 116 **Chris Nolan , Martín Miranda & Tom Burton** (*UNSW*, NSW)
	Prac 3_3 | *In Vivo* Fibre Photometry | *Group 3* | WW LG25 **Chelsea Goulton**, **Phil JRDB** (*UNSW* NSW), **Leigh Walker** (*Florey* VIC)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Wallace Wurth Seminar Room (WW LG03)
19:30 – 20:30	*Special Lecture* Astrocyte Evolution **Carmen Falcone** | *Towson University* (USA)
20:30 – Late.	Post Lecture Discussion

Wednesday 27 MAY — LEARNING AND NEUROMODULATION (I)

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G12)
09:00 – 10:15	Studying Neural Systems *in vivo* **Lizzie Manning** | *University of Newcastle* (NSW)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G12)
10:45 – 12:00	Capturing Learning through Fibre Photometry **Philip Jean-Richard Dit Bressel** | *UNSW Sydney* (NSW)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Computing Lab | Behaviour Lab
13:00 – 18:00	Training Day 3 | *All Groups* | WW LG26 **Jay Bertran-Gonzalez** (*UNSW* NSW) **& Beatrice Leung** (*UNSW* NSW) Prac 3_1 | *In Utero* Electroporation | *Group 2* | WW LG07 **Annalisa Paolino** (*UQ* QLD) **& Dylan Black** (*UQ* QLD) Prac 3_2 | Advanced Behaviour | *Group 3* | WW 116 **Chris Nolan , Martín Miranda & Tom Burton** (*UNSW*, NSW) Prac 3_3 | *In Vivo* Fibre Photometry | *Group 1* | WW LG25 **Chelsea Goulton**, **Phil JRDB** (*UNSW* NSW), **Leigh Walker** (*Florey* VIC)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Wallace Wurth Seminar Room (WW LG03)
19:30 – 20:30	*Special Lecture* Unique Signatures for Learning in Distinct Dopamine Circuits **Melissa Sharpe** | *University of Sydney* (NSW)
20:30 – Late.	Post Lecture Discussion

Thursday 28 MAY — LEARNING AND NEUROMODULATION (II)

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G06)
09:00 – 10:15	Acetylcholine Systems in the Striatum **Nathalie Dehorter** | *Queensland Brain Institute* (UQ)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G06)
10:45 – 12:00	Muscarinic Control of Neural Function and Chemogenetics **Leigh Walker** | *The Florey Institute of Neuroscience* (VIC)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	ACAN Computing Lab | Behaviour Lab
13:00 – 18:00	Learning Encoding Test 1 | *All Groups* | WW LG26 **Jay Bertran-Gonzalez** (*UNSW* NSW) **& Beatrice Leung** (*UNSW* NSW) Prac 3_1 | *In Utero* Electroporation | *Group 3* | WW LG07 **Annalisa Paolino** (*UQ* QLD) **& Dylan Black** (*UQ* QLD) Prac 3_2 | Advanced Behaviour | *Group 1* | WW 116 **Chris Nolan, Martín Miranda & Tom Burton** (*UNSW*, NSW) Prac 3_3 | *In Vivo* Fibre Photometry | *Group 2* | WW LG25 **Chelsea Goulton**, **Phil JRDB** (*UNSW* NSW), **Leigh Walker** (*Florey* VIC)
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Wallace Wurth Seminar Room (WW LG03)
19:30 – 20:30	*Special Lecture* Dopamine, Acetylcholine and Corticostriatal Plasticity **John Reynolds** | *University of Otago* (NZ)
20:30 – Late.	Post Lecture Discussion

THEME 3 | SYSTEMS to BEHAVIOUR

Friday 29 MAY — SYSTEMS FAILURE

07:30 – 08:45	Breakfast (Perouse Randwick)
SUNRISE SESSION	Lecture Room (WW G01)
09:00 – 10:15	Subcortical Systems and Disease **Robyn Brown** | *The Florey Institute of Neuroscience* (VIC)
10:15 – 10:45	Coffee Break
MORNING SESSION	Lecture Room (WW G01)
10:45 – 12:00	Synaptic Genes & Cognition **Jess Nithianantharajah** | *Florey Institute of Neuroscience* (VIC)
12:00 – 13:00	Lunch (UNSW Food Court)
AFTERNOON PRAC	Lecture Room | Behaviour Lab
13:00 – 18:00	Learning Encoding Test 2 | *All Groups* | WW LG26 **Jay Bertran-Gonzalez** (*UNSW* NSW) **& Beatrice Leung** (*UNSW* NSW) INTEGRATIVE WORKSHOP | WW G06 **Lee Fletcher** (*Monash* VIC), **Christina Mo** (*Florey* VIC), **John Power** (*UNSW* NSW) & **Jay Bertran-Gonzalez** (*UNSW* NSW) *Discussion-based session aimed at integrating the fundamental concepts acquired during the course with a novel experimental research program individually or as groups. Students will work on their research question together with faculty.*
18:30 – 19:30	Dinner (Social area – WW 360)
SUNSET SESSION	Wallace Wurth Seminar Room (WW LG03)
19:30 – Late.	Preparation of Presentations | *All Groups*

Saturday 30 MAY — WRAP UP!

07:30 – 08:45	Breakfast (Perouse Randwick)
MORNING PRAC	Lecture Room (G01) & Computing Lab (WW 116)
09:00 – 12:00	Preparation of Presentations | *All Groups* Behavioural data processing | *Selected groups*
12:00 – 13:00	Lunch (Social area – WW 360)
AFTERNOON SESSION	Lecture Room (WW G01)
13:00 – 19:30	Student Presentations | *All students* Conditioning Experiment Results | *All students*
SUNSET SESSION	Coogee Beach
19:30 – 21:00	END OF COURSE DINNER
21:00 – Late.	Drinks Coogee + The Spot

Sunday 31 MAY — RETURN HOME

07:30 – 09:00	Breakfast (Perouse Randwick)
09:00 onwards	Checkout and Safe return home.

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Kristen Anderson (USyD, NSW)

Sophie Catchpole (UWA, WA)

Samuel Combes (Florey, VIC)

Sara Assar Kashani (Macquarie, NSW)

Ilya Kuzovkin (UNSW, NSW)

Bridget Milky (SAHMRI, SA)

Navide Sabbaghi (ANU, ACT)

Neda Sabbaghi (ANU, ACT)

Matthew Schwarz (Flinders, SA)

Maxine Sokolowski (Max Planck, Germany)

Stian Thomson (Auckland, New Zealand)

Ariana Tuson (Otago, New Zealand)

STUDENT BIOSKETCHES

Kristen ANDERSON

I am a 3rd-year PhD student in neuroscience at The University of Sydney, where my research focuses on the neural mechanisms underlying chronic neuropathic pain and its interaction with fear learning. My work uses a combination of behavioural assays and ex vivo electrophysiology in mouse models, particularly the chronic constriction injury (CCI) model, to investigate how persistent pain alters synaptic transmission within the lateral amygdala. I am especially interested in how these changes contribute to maladaptive fear and anxiety-related behaviours. My current research involves patch-clamp recordings to examine alterations in excitatory and inhibitory synaptic function. In the near future, I plan to extend this work to investigate long-term synaptic plasticity, including LTP and LTD, and to incorporate circuit-specific approaches such as optogenetics to better understand input-specific changes in amygdala function. Following my PhD, I aim to continue in neuroscience research in a postdoctoral position where I can further explore circuit-level mechanisms underlying affective disorders and pain. Through ACAN, I aim to further develop my technical expertise in advanced neurophysiological methods and broaden my perspective on studying neural circuits.

Sophie CATCHPOLE

I am a PhD student at the University of Western Australia, completing my studies under the supervision of Dr Alex Tang and Dr Jamie Beros in the Healthy brain ageing and plasticity lab. Building on preliminary data collected during my Honours project, my PhD research investigates the impact of ischemic stroke during the critical period on axon initial segment structure and function, both acutely and into adulthood. I am using a well-established stroke model in transgenic mice to investigate structural and functional changes to the axon initial segment using confocal microscopy, live twophoton calcium imaging, and electrophysiological methods. The knowledge gained from this project will provide a foundation for developing more effective and targeted treatments for paediatric stroke, thus leading to better recovery outcomes for patients. I hope that through ACAN, I can expand my technical skillset to be able to study neural circuits from single cell function to network activity and establish meaningful collaborations to enhance my PhD project and build a future career in neuroscience research.

Samuel COMBES

My name is Sam, and I am currently a third-year PhD student at The Florey Institute for Neuroscience and Mental Health, under the Faculty of Medicine at the University of Melbourne, supervised by Professor Lucy Palmer, Head of The Neural Networks Laboratory. Our lab investigates the neural activity underlying sensory-based behaviour and memory formation, with a focus on how synaptic input and dendritic integration are shaped by different brain regions. We use in vivo approaches including two-photon calcium imaging, somatic and dendritic patch-clamp electrophysiology, and optogenetics. I joined the lab in 2023 for my honours year, where I examined cortical activity during goal-directed behaviour, focusing on how neural dynamics support sensory-guided actions. In my PhD, I extend this work into a disease context by investigating how glioma progression disrupts neuronal activity and memory-related circuits. Using a stem-cell-derived human glioma xenograft model, I combine longitudinal two-photon calcium imaging with behavioural assays to track changes in neuronal population dynamics during tumour progression. My research focuses on neuron–glioma interactions and their impact on synaptic and network function. I also use optogenetics to inversely elucidate the neural affect on glioma, and have plans to implement patch-clamp electrophysiology to directly probe synaptic and dendritic mechanisms underlying tumour-induced circuit dysfunction. Through ACAN 2026, I aim to deepen my understanding of in-vivo techniques, and connect with like-minded, passionate neuroscientists!

Sara Assar KASHANI

I am a final-year PhD candidate in neuroscience at Macquarie University, where I study the molecular mechanisms underlying amyotrophic lateral sclerosis (ALS), with a particular focus on FUS protein and cytoskeletal dysfunction. My work combines cellular and animal models, including iPSC-derived motor neurons, mice, and zebrafish, to understand how disrupted actin dynamics contribute to neurodegeneration. More recently, my research has shifted toward synaptic connectivity and how actin dynamics shape neuronal function. During my Master's, I explored the regenerative potential of stem cell–derived extracellular vesicles in a type 1 diabetes rhesus monkey model, which sparked my interest in translational and therapeutic research. Through the ACAN program, I'm looking to approach my research questions from a systems neuroscience perspective, linking molecular changes to circuit-level outcomes while building new technical and collaborative skills. Looking ahead, I'm aiming to move into a postdoctoral role in neurodegenerative disease and therapeutic development, with a strong focus on research that leads to meaningful, patient-centered outcomes.

Ilya KUZOVKIN

Hi, I'm Ilya! I did my PhD in computational neuroscience at the University of Tartu (Estonia) in 2020 comparing artificial and biological mechanisms of vision. Since then I've moved to Australia, worked in industry applying machine learning to various domains, including neurotechnology and robotics, and in 2025 got a postdoctoral grant to resume my academic journey in NeuroAI at UNSW Decision Neuroscience Lab. The upcoming postdoc project bridges computational neuroscience and machine learning to build a biologically constrained artificial neural network model of basal ganglia circuits to capture the neural mechanisms of decision-making. The model will integrate anatomical connectivity, neuromodulatory constraints, behavioural data, and neural recordings into a single computational framework, use the distance between model's internal dynamics and in vivo rodent recordings as an additional constraint, and is trained with reinforcement learning to incorporate the behavioural element. I'm joining ACAN to complement my computational neuroscience and machine learning background with a deeper understanding and hands-on experimental experience in modern neuroscience techniques & data acquisition methods and to build a better bridge between computational thinking and experimental design and reality.

Bridget MILKY

I am an early career researcher at the South Australian Health and Medical Research Institute (SAHMRI) and Flinders University, within the Laboratory for Human Neurophysiology and Genetics led by Prof Cedric Bardy. During my PhD, I developed a novel coating for glass coverslips that supports stable cell adhesion, and assisted with the validation of BrainPhys Imaging medium; both of which are critical for optimised patch-clamp and imaging experiments. My current research uses patient-derived midbrain dopaminergic neural cultures to investigate the bioenergetic mechanisms underlying Parkinson's disease. My work integrates *in vitro* optogenetics and neuropharmacology with multi-electrode array electrophysiology, and involves collaborations with Prof Rusty Gage at the Salk Institute and Dr Jeff Jones at the University of Florida. Through ACAN, I aim to leverage advanced whole-cell patch-clamp and calcium imaging techniques to interrogate the functional changes influencing Parkinson's disease and Lewy Body Dementia at single-cell resolution.

Navide SABBAGHI

I am a second-year PhD candidate in the Synaptic Mechanisms Group at the Eccles Institute of Neuroscience, Australian National University, supervised by Associate Professor Brian Billups. I have a background in biomedical engineering and, before commencing my PhD, I completed a Master of Neuroscience in the same laboratory. My research investigates how presynaptic glutamine uptake supports the balance between excitation and inhibition during epileptic activity. Building on recent work from our group showing that neurotransmitter transporter 4 (NTT4) is essential for sustaining glutamate supply during high-frequency neurotransmission, I aim to determine how this transporter shapes glutamate release dynamics and contributes to network stability under pathological conditions, such as epileptic seizures. To address these, I employ a combination of electrophysiology, fluorescence imaging, and fibre photometry. At this stage, I have established an *in-vitro* seizure model using mouse hippocampal slices and identified significant differences in CA1 network activity between experimental and wild-type groups. Moving forward, I will employ viral-mediated gene delivery to express the glutamate biosensor iGluSnFR in the mouse hippocampus and quantify glutamate dynamics using *in-vitro* imaging. I also plan to extend this work *in-vivo* by applying fibre photometry to monitor glutamate signalling in behaving mice.

Neda SABBAGHI

I am a second-year PhD student at Australian National University, supervised by Professor John Bekkers. Our lab is interested in understanding how the mammalian brain processes sensory information from the external world, with a particular focus on the olfactory system. I previously completed a Master of Neuroscience in the same lab, where I explored the feasibility of studying connections from the primary olfactory cortex (piriform cortex; PCx) to the orbitofrontal cortex (OFC). Building on this work, my PhD focuses on understanding the role of this little-studied circuit. So far, I have used Channelrhodopsin-2-Assisted Circuit Mapping (CRACM) to investigate long-range functional connections between PCx and OFC neurons. My electrophysiological and morphological analyses show powerful monosynaptic connections from the PCx to many identified cell types in the OFC. Moving forward, I aim to explore the functional roles of these connections by using opto- and chemogenetic manipulations in awake, behaving mice. I am looking forward to ACAN as an opportunity to deepen my understanding of core neuroscience concepts, while also connecting with fellow students and researchers from diverse backgrounds.

Matthew SCHWARZ

Matthew Schwarz is an early career neuroscientist. He completed his PhD at the University of Adelaide in late 2024 with Prof. Dave O'Carroll and A/Prof. Steven Wiederman in the Visual Physiology & Neurobotics Laboratory, where he used electrophysiology to characterise neural adaptation in dragonfly small target motion detector neurons. He is currently a postdoctoral researcher at Flinders University with Prof. Karin Nordström in the Motion Vision Group, applying the same techniques to study loom-sensitive descending neurons in hoverflies. In August, he will commence a postdoctoral position at La Trobe University with Dr. Amanda Franklin, investigating red light and heat detection in jewel beetles. Matt's work to date examines how characterised neurons within visual pathways respond to repeating preferred stimuli, and how response history shapes subsequent neural responses. He also studies how convergent visual pathways are integrated, and how these dynamics shape behaviourally relevant motor signals over timescales ranging from hundreds of milliseconds to minutes. More broadly, his long-term goal is to understand how sensory signals from different modalities are integrated in neural circuits, where behaviourally relevant computations occur, and how those computations give rise to behaviour.

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Maxine SOKOLOWSKI

I am a second year PhD student in the 'Instinctive Behavioral Circuits' group of Dr. Vanessa Stempel at the Max-Planck Institute for Brain Research in Frankfurt, Germany. I completed my Bachelor's and Master's degrees in Biology in Germany, where I am originally from. During my Master's thesis, I joined Vanessa Stempel's lab and began the project I am continuing today as a PhD student. My research is driven by a broader interest in how female-specific physiological states shape fundamental neural circuits and the behaviors they govern. Focusing on the Periaqueductal Gray (PAG), a brainstem region critical for instinctive behaviors such as defensive responses and fear processing, I investigate how hormonal fluctuations across the estrous cycle influence the activity of individual neurons within this circuit. To address this, I use *ex vivo* patch-clamp electrophysiology in acute brain slices of naturally cycling female mice, identifying differences in single-neuron activity across cycle stages. Looking ahead, I plan to scale from single-cell recordings to population-level dynamics by implementing in vivo calcium imaging in freely behaving animals, directly linking PAG circuit activity to behavioral output across the estrous cycle and bridging the cellular and systems levels of analysis.

Stian THOMSON

I am a second-year PhD student in the Cardiorenal Research Group at the University of Auckland, supervised by Dr Julia Shanks and A/Prof Rohit Ramchandra. During my undergraduate and Honours years, I developed an interest in autonomic regulation and parasympathetic control of the heart. My PhD project aims to characterise alterations in parasympathetic signalling in heart failure with preserved ejection fraction (HFpEF). Currently, I use whole-nerve recordings from a cardiac-projecting branch of the vagus nerve to examine the effect of parasympathetic bursting activity on cardiac haemodynamics. Further, I will explore how this activity is locally integrated by the intracardiac ganglia using electrophysiological recordings and immunofluorescence imaging techniques, many of which are taught at ACAN. My overarching goal is to better understand this condition and provide a translatable foundation for developing novel neuromodulatory and pharmacological approaches for treating HFpEF. Following my PhD, I hope to continue studying neurocardiac interactions and their contribution to cardiovascular disease.

Ariana TUSON

Kia ora! I'm a PhD student in John Reynolds's lab at the University of Otago. After completing my undergraduate degree in Neuroscience, I went on to complete my Honours research in 2024, which explored how our focused ultrasound headset could be developed in a more culturally appropriate way for Indigenous people with Parkinson's disease. This headset is designed to trigger targeted dopamine release from injected liposomes, enabling a more phasic and naturalistic delivery pattern, with the aim of reducing side effects associated with current medications. My PhD builds on this work by investigating whether mechanosensitive ion channels, particularly TRPC6, mediate localised ultrasound effects in vivo in a rat model. I'm especially focused on their role in reward-related brain circuits relevant to tinnitus, and whether these pathways can be neuromodulated using focused ultrasound without microbubbles or liposomes. My research involves stereotaxic surgeries to implant an ultrasound transducer and optical fibre, alongside fibre photometry to record neural activity during stimulation. Part of my PhD will also involve qualitative research with Indigenous communities affected by tinnitus. Looking ahead, I hope to complete my PhD and pursue a postdoctoral pathway.

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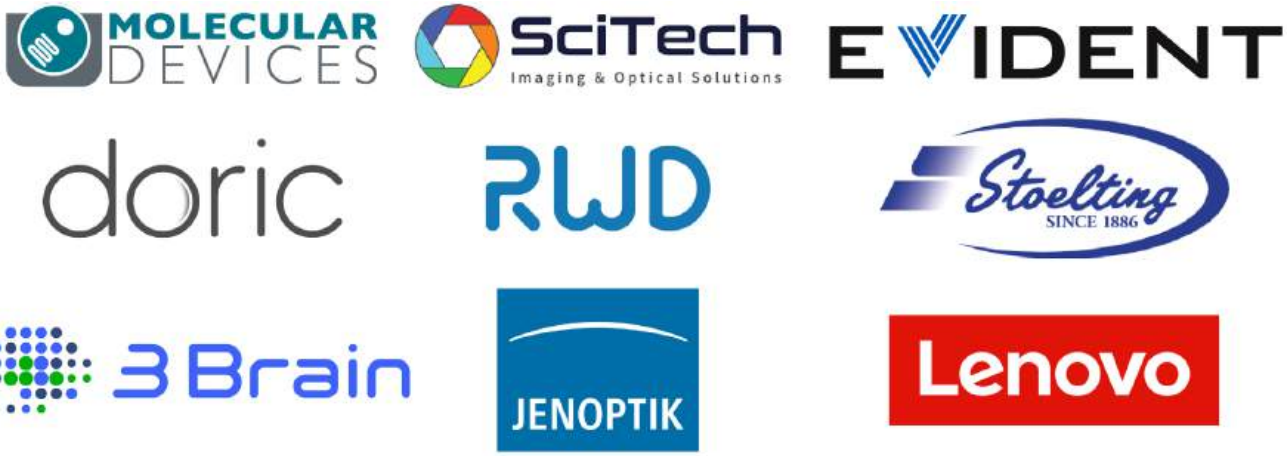
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