The 3rd International Conference on Mineral Engineering and Materials Science (iCMEMS-2025)
Western Sydney University (Parramatta South Campus)
26-28 November 2025, Sydney, Australia

Jointly organised by

Western Sydney University
Global Circle for Scientific, Technological and Management Research (GCSTMR)
Northeastern University
University of Wollongong
UNSW Sydney
Lanzhou University
Hunan University
Jiangxi University of Science and Technology

Website: https://icmems.net.au/

Conference Management by GCSTMR, Sydney, Australia

Welcome Messages

Welcome to iCMEMS-2025.

On behalf of the Organising Committee, thank you to everyone who has made this event possible: our authors and presenters for their intellectual contributions, our reviewers for upholding the quality of the program, our keynote speakers for their inspiring vision, and our volunteers for their invaluable support. We are especially grateful to all attendees for your active participation in making this a truly collaborative event.

iCMEMS is dedicated to sharing cutting-edge research, fostering cross-disciplinary collaboration, and inspiring future directions in fields from mineral engineering to materials science and beyond.

Special announcement: Call for full papers — iCMEMS-2025 Special Issue

- Submit full papers to the iCMEMS Special Issue in "**Springer Proceedings in Physics**" scheduled for publication in March 2026.
- Eligible submissions will be considered for the **iCMEMS Best Paper Awards** and **Student Best Paper Awards**.
- Submission timelines, formatting, and review details will be shared via the conference website and email.

We hope the sessions inspire new ideas, the discussions lead to lasting collaborations, and the connections you make here continue well beyond the closing session. Thank you for your contributions to a successful conference.

A/Prof Qinghua Zeng, co-chair
Prof Xizhong An, co-chair
Dr Xuefeng Dong, secretary
iCMEMS-2025
26–28 November 2025
Western Sydney University, Parramatta South Campus
https://icmems.net.au/

Conference Committee

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A/Prof Qinghua Zeng, Western Sydney University, Australia
Prof Xizhong An, Northeastern University, China

Secretary

Dr Xuefeng Dong, University of Wollongong, Australia

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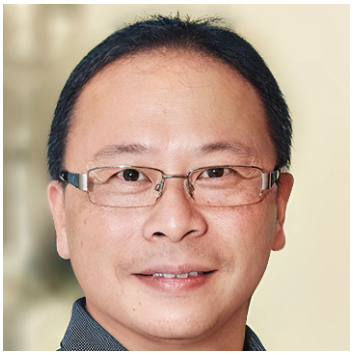
Dr Qijun Zheng, Monash University, Australia
Prof Zongyan Zhou, Jiangxi University of Science and Technology, China
A/Prof Haiping Zhu, Western Sydney University, Australia
A/Prof Qinghua Zeng, Western Sydney University, Australia

Keynote Speakers

(Alphabetical order)

Professor Jie Bao
Director
ARC Research Hub for Integrated Energy Storage Systems
School of Chemical Engineering, UNSW



Professor Jie Bao is a Process Control expert of international repute, particularly in dissipativity- and passivity-based process control. He is the Director of ARC Research Hub for Integrated Energy Storage Systems and leads the Process Control Research Group, School of Chemical Engineering. He has been awarded over AUD 18 million competitive research funding (excluding infrastructure funding) in the field of process control, control theory and applications, including 13 Australian Research Council Discovery Projects/ARC Large grants, 1 CSIRO National Flagship project, 5 ARC Industry Research Hub Projects, and several major industrial research grants. His research interests include dissipativity theory-based process control, networked and distributed control systems, system behavioural theory and control applications in membrane separation, flow batteries, coal preparation and aluminium smelting. He has published extensively in major process control and chemical engineering journals. He is an Associate Editor of *Journal of Process Control* (an International Federation of Automatic Control affiliated journal), Digital Chemical Engineering (an IChemE affiliated journal) and Journal of Franklin Institute (established in 1826). He is appointed by the ARC to the College of Experts. He also serves on the International Federation of Automatic Control Technical Committees: Chemical Process Control (TC6.1); Mining, Mineral and Metal Processing (TC6.2).

Professor Zaiping Guo
Department of Materials Science and Engineering,
City University of Hong Kong

Professor Zaiping Guo is a Chair Professor of Engineering Materials at CityUHK since July 2025. Prior to her move to Hong Kong, she was a Professor and Australian Laureate Fellow in the School of Chemical Engineering at the University of Adelaide. She has served as an Associate Editor for *Chemical Science*, a flagship journal of the Royal Society of Chemistry (RSC) since May 2022. She was elected a Fellow of Australian Academy of Science and Australian Academy of Technological Sciences and Engineering in 2023. Her research focuses on the design and application of electrode materials and electrolyte for energy storage and conversion, including rechargeable batteries, hydrogen storage, and fuel cells. Her research achievements have been recognized through numerous awards, including an ARC Queen Elizabeth II Fellowship in 2010, an ARC Future Professorial Fellowship in 2015, an ARC Laureate Fellowship (2021). She has also been named a Clarivate Analytics Highly Cited Researcher Award for seven consecutive years (2018-2024). In addition, she received the 2020 NSW Premier's Prizes for Science and Engineering for Excellence in Engineering or Information and Communications Technology.

Professor Jun Huang
Director, The Laboratory for Catalysis Engineering
School of Chemical and Biomolecular Engineering
The University of Sydney

Professor Jun Huang received his PhD from University of Stuttgart in 2008. After his postdoctoral fellow at Georgia Institute of Technology and ETH Zurich, he joined the University of Sydney as a permanent faculty in 2010, moving up the ranks to Professor at Sydney. Jun is the Academic Leader of University of Sydney – Zhejiang University Joint Lab on Sustainable Environment. His research is to develop emerging nanoporous catalysts and supported nanometal catalysts for more attractive, practical, and cleaner processes using in situ characterization techniques coupled with innovative reaction engineering. Jun has published over 250 journal publications in high-rank Journals. He has been awarded over AU$ 12m research grants and many prestigious awards including *ACS Sustainable Chemistry & Engineering Lectureship Award,* CCST-IChemE Carbon Capture Outstanding Achievement Award, Australia's Most Innovative Engineer, and the Vice-Chancellor's Awards for Excellence Outstanding Research. Jun is the Editor-in-Chief of *Materials Today Sustainability, Editorial Group Member of National Science Review, and the Editorial Board member of other high-rank journals.*

Dr Renhu Pan
Managing Director
Zhejiang Ruike Enviro-tech Engineering Co., Ltd.

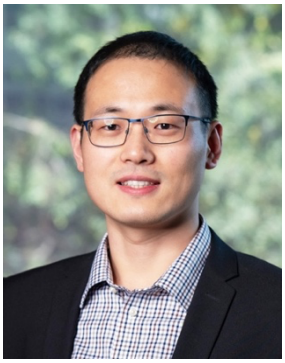
Dr Renhu Pan received his PhD degree in Pneumatic Conveying of Bulk Materials from University of Wollongong, Australia in 1993. He was a lecturer at the Department of Mechanical Engineering, the University of Newcastle, Australia from 1998 to 2002. In 2002, he jointed and had been a vice-president of Fujian Longking Co. Ltd., China until 2023, being totally in charge of Bulk Materials Handling (BMH) business. Currently he is a Managing Director of Zhejiang Ruike Enviro-tech Engineering Co., Ltd. and Industry Expert (Professor) of Xiamen University, China. His main research interests focus on BMH (mainly pneumatic conveying of fly ash up to 1000MW units, wet and dry FGD ash, limestone and mill rejects, pipe conveyor and dust suppression) and the application of AI and digital control in BMH. So far over two thousand BMH (including trouble shooting) projects have been conducted successfully.

Professor Geoff Wang
Faculty Director of China Research Partnership
Executive Director of the Baosteel-Australia Joint R&D Centre (BAJC)
Advisory Director of HBIS-UQ Innovation Centre for Sustainable Steel (ICSS)
School of Chemical Engineering
Faculty of Engineering, Architecture and Information Technology
The University of Queensland

Geoff Wang received his PhD in Metallurgical Engineering from the Northeastern University, Shenyang, China in 1990, and then worked in Wuhan University of Science and Technology for 5 years and then about 2 years at University of New South Wales.

He joined the University of Queensland in end of 1996 until now. His research activity and interests are directed towards developing energy and environmental technologies dealing with the coal and steel industries. He has been active for research in clean coal energy and low-carbon technologies such as pulverized coal injection into blast furnaces, modelling in ironmaking and steelmaking, hydrogen production through lower emission coal gasification, coal seam gas recovery and CO_2 sequestration, and in recent years, the chemical and electrochemical conversion of CO_2 to fuel or reusable chemicals, carbon recycling in ironmaking blast furnace and the hydrogen shaft furnace.

Dr Xiaobing Yu
Research Fellow
School of Chemical Engineering, UNSW



Dr Xiaobing Yu is a Research Fellow in the School of Chemical Engineering at the University of New South Wales. His research expertise encompasses computational fluid dynamics (CFD), metallurgical process modelling, and computational program development. His primary research focuses on the modelling and optimisation of blast furnace ironmaking, including hydrogen-based smelting, carbon composite briquette utilisation, central coke charging, and transient in-furnace phenomena. Additionally, during his postdoctoral fellowship, he contributed to research on basic oxygen furnace (BOF) simulation and raceway behaviour analysis.

Professor Paul Zulli
Director, Australian Steel Manufacturing Research Hub
School of Mechanical, Materials, Mechatronic and Biomedical Engineering
University of Wollongong

Dr Paul Zulli is an internationally recognised leader in steel manufacturing research, technology development and deployment, combining over 35 years of technical and management experience across steel and ferrous minerals industries. He is a respected leader of multi-disciplinary teams, with an established reputation for delivery of tactical and strategic project outcomes into operating businesses. An influential senior manager, he has been active in seeking to bridge the gaps between academic research products and innovative industrial solutions, with the goal to provide value-adding and sustainable outcomes. His specific areas of scientific reputation include development and implementation of simulation methods and operational systems concerned with complex manufacturing processes in difficult industrial settings, coupled with experimentation, pilot and plant trials activities. He is an elected Fellow of the Australian Academy of Technological Sciences and Engineering. Based at the University of Wollongong, he was appointed Director of the ARC Research Hub for Australian Steel Manufacturing in March 2017 and is now leading the second hub.

Conference Program

Time: Australian Eastern Time (AEST)
Day 1 – Wednesday 26 November 2025
Parramatta South Campus, Building EA Foyer

Registration, Refreshments, and Networking	
5:30-7:30 pm	Delegates will be welcomed by **Conference Chairs:** Prof. Chin Leo (iCGMGE-2025) A/Prof. Fidelis Mashiri (iCSER-2025) A/Prof. Qinghua Zeng (iCMEMS-2025) **Conference Secretaries:** Dr. Pan Hu (iCGMGE-2025) Dr. Md Kamrul Hassan (iCSER-2025) Dr. Xuefeng Dong (iCMEMS-2025) **Conference Management Coordinator:** Ms Jenis Islam

Day 2 – Thursday 27 November 2025
Building EB, Room PS-EB.G.21
Zoom ID: 854 7939 9052, Password: icmems

Conference Registration	
8:00 – 9:00 am	Parramatta South Campus: • Day 1: Building EA Foyer • Day 2 and Day 3: Building EB, Room PS-EB.G.18 Desk in charge: Ms Jenis Islam
Session 1 - Conference Opening (Room PS-EA.2.13 (LT02)) **Zoom Link/ID: http://uws.zoom.us/s/2804663551**	
9:00 – 10:00 am	Moderator: Prof. Chin Leo, Chair (iCGMGE-2025) Acknowledgment of Indigenous owners of the land Speech: Prof. Ataur Rahman, Chair GCSTMR Speech: Prof. Chin Leo, Chair (iCGMGE-2025) Speech: A/Prof. Fidelis Mashiri, Chair (iCSER-2025) Speech: A/Prof. Qinghua Zeng, Chair (iCMEMS-2025) Speech: Prof. Yang Xiang Acting Dean, School of Engineering, Design and Built Environment Speech: Nicole Waterman, FIEAust CPEng NER President, Engineers Australia (Sydney Division) Housekeeping: Prof. Ataur Rahman
Session 2 – Chairs: Qinghua Zeng and Shibo Kuang (Room PS-EB.G21)	
10.00 – 10:30 am	**Keynote:** Electrode and electrolyte design for high-performance aqueous zinc-ion batteries. **Zaiping Guo** (City University of Hong Kong)
Morning Tea: 10:30-11:00 (Room PS-EB.G.32 and EB.G.33)	
Session 3 – Chairs: Xuefeng Dong and Xiaobing Yu (Room PS-EB.G21)	
11:00 –11:30 am	**Keynote:** Numerical analysis of internal nitrogen recycling for hydrogen-based Shaft Furnace. **Geoff Wang** (The University of Queensland)
11:30 –11:50 am	**Invited:** Enhancing hydrocyclone performance through mechanistic and data-driven modeling. **Shibo Kuang** (Monash University)
11:50 –12:10 pm	**Invited:** Dynamic mechanical behaviors of composite materials and structures. **Weifu Sun** (Southeast University)
12:10 –12:30 pm	**Invited:** Numerical study on the injection of pre-reduced iron ore fines into a blast furnace. **Ting Shi** (UNSW Sydney)

Lunch: 12:30-1:30 pm (Room PS-EB.G.32 and EB.G.33)	
Session 4 – Chairs: Runyu Yang and Shengliang Zhong (Room PS-EB.G21)	
1:30-2:00 pm	**Keynote:** Flexible operation of aluminium smelters for transition to renewable energy. **Jie Bao** (UNSW Sydney)
2:00-2:20 pm	**Invited:** Developing nanoparticle interaction force models from molecular dynamics. **Qinghua Zeng** (Western Sydney University)
2:20-2:40 pm	**Invited:** Optimization of adsorption sites through combining orbit-weighted dual descriptor with electrostatic potential method. **Yingwei Liu** (Harbin Engineering University)
2:40-3:00 pm	**Invited:** Molecular dynamics study on the deformation and heat transfer mechanisms of nano-Al_2O_3 particles under extreme conditions. **Qijun Zheng** (Monash University) **(Online)**
After Tea: 3:00-3:30 (Room PS-EB.G.32 and EB.G.33)	
Session 5 – Chairs: Kejun Dong and Kailai Chen (Room PS-EB.G21)	
3:30-4:00 pm	**Keynote:** Development of highly selective nanocatalysts for CO2 upcycling. **Jun Huang** (The University of Sydney)
4:00-4:20 pm	**Invited:** Electromagnetic field behaviour in an electric smelting furnace under alternating current conditions. **Xuefeng Dong** (University of Wollongong)
4:20-4:40 pm	**Invited:** Coordination polymer ultrafine powders and their composites: preparation, conversion and properties. **Shengliang Zhong** (Jiangxi Normal University)
4:40-5:00 pm	**Invited:** Engineering oxygen vacancies and acidic site density in MnOx/CMS via Mn^{3+}/Mn^{4+} ratio manipulation for ambient deep desulfurization. **Yun Zhang** (Lanzhou University) **(Online)**

Conference Dinner:

- **Time: 7:00-10:00 pm (Only for the Conference Dinner Ticket Holders)**
- **Venue: Novotel Sydney Parramatta (map), 350 Church St, Parramatta NSW 2150 – Prince Alfred Square light rail station)**
- **Welcomed by Professor Kevin Dunn, Deputy Vice-Chancellor, Western Sydney University**

Day 3 – Friday 28 November 2025
Building EB, Room PS-EB.G.21
Zoom ID: 854 7939 9052, Password: icmems

Conference Registration	
8:00 – 9:00 am	Parramatta South Campus: • Day 1: Building EA Foyer • Day 2 and Day 3: Building EB, Room PS-EB.G.18 Desk in charge: Ms Jenis Islam
Session 6 – Chairs: Geoff Wang and Ting Shi (Room PS-EB.G21)	
9.00 – 9:30 am	**Keynote:** System Estimation and AI Control on Pneumatic Conveying. **Renhu Pan** (Zhejiang Ruike Enviro-tech Engineering Co., Ltd.)
9:30 – 9:50 am	**Invited:** A particle–pore scale PNM framework for simulating multiphysics transport in particle–fluid systems. **Yi Zou** (Monash University)
9:50 – 10:05 am	Numerical investigation of triboelectric charging effects in adhesive mixtures within a high-shear mixer. **Yurui Wang** (UNSW Sydney)
10.05 – 10:20 am	Effect of surfactant type and surface orientation on the wettability of FAU zeolite: a molecular simulation approach. **Yilin Li** (Western Sydney University)
Morning Tea: 10:30-11:00 (Room PS-EB.G.32 and EB.G.33)	
Session 7 – Chairs: Renhu Pan and Xuefeng Dong (Room PS-EB.G21)	
11:00 –11:30 am	**Keynote:** A transitional pathway to low-carbon steel production: challenges to overcome through R&D. **Paul Zulli** (Wollongong University)
11:30 –11:50 am	**Invited:** Experimental and numerical study on the metallurgical properties of raw materials used in the blast furnace. **Kailai Chen** (Monash University)
11:50 –12:05 pm	A DEM-FRM-PBM coupled model calibrated by overall grinding results and incorporating energy variation for long-term prediction of particle size evolution in ball mills. **Yudong Zou** (UNSW Sydney)
12:05 –12:20 pm	Numerical study on the effect of particle size distribution on hydrocyclone classification efficiency. **Qiuzhe Hu** (Western Sydney University)
Lunch: 12:30-1:30 pm (Room PS-EB.G.32 and EB.G.33)	
Session 8 – Chairs: Yuchen Dai and Ting Shi (Room PS-EB.G21)	
1:30-2:00 pm	**Keynote:** Transient-state dynamics of blast furnace ironmaking with shaft-injected hydrogen. **Xiaobing Yu** (UNSW Sydney)
2:00-2:15 pm	Effect of Si/Al ratio on geopolymer structure and its binding strength with expansive clay minerals: a molecular dynamics study. **Yikang Hu** (Western Sydney University)

2:15-2:35 pm	Coupling computational fluid dynamics and finite element method (CFD-FEM) for modelling dense particle-fluid flows. **Yinghui Wu** (Monash University)
2:35-2:55 pm	Quasi-two-dimensional vortex dynamics and self-organization in buoyancy-driven thermal turbulence. **Jinming Liang** (Lanzhou University)
After Tea: 3:05-3:30 (Room PS-EB.G.32 and EB.G.33)	
Session 9 – Chairs: Runyu Yang and Yi Zhou (Room PS-EB.G21)	
3:30-3:45 pm	**Invited:** Rotating fluid flow and energy mode decomposition. **Yumeng Zhang** (Lanzhou University) **(Online)**
3:45-4:00 pm	Interface-engineered ZrO2@W2C-WOx heterojunctions with a built-in electric field for selective, 1O2-dominated oxidative desulfurization. **Huirong Zhang** (Lanzhou University) **(Online)**
4:00-4:15 pm	A coupled CFD-DEM model for fine particle flow and agglomeration in supersaturated vapor. **Hainuo Wang** (Lanzhou University) **(Online)**
4:15-4:30 pm	Influence of particle loading on turbulence modulation in forced vortex flows. **Miaomin Hong** (Lanzhou University) **(Online)**
4:30-4:45 pm	Numerical investigation of swirling vortices and particle drying behavior in an industrial spray dryer. **Qing Lv** (Lanzhou University) **(Online)**
4:45-5:00 pm	Aerodynamic analysis and Bézier-based optimization of Savonius blades in swirling flow fields. **Zhaojun Cao** (Lanzhou University) **(Online)**
Session 10 - Conference Closing	
6:00-6:30 pm	Building EA, Room PS-EA.2.13 (LT02) Zoom Link/ID: **http://uws.zoom.us/s/2804663551**

Conference Information

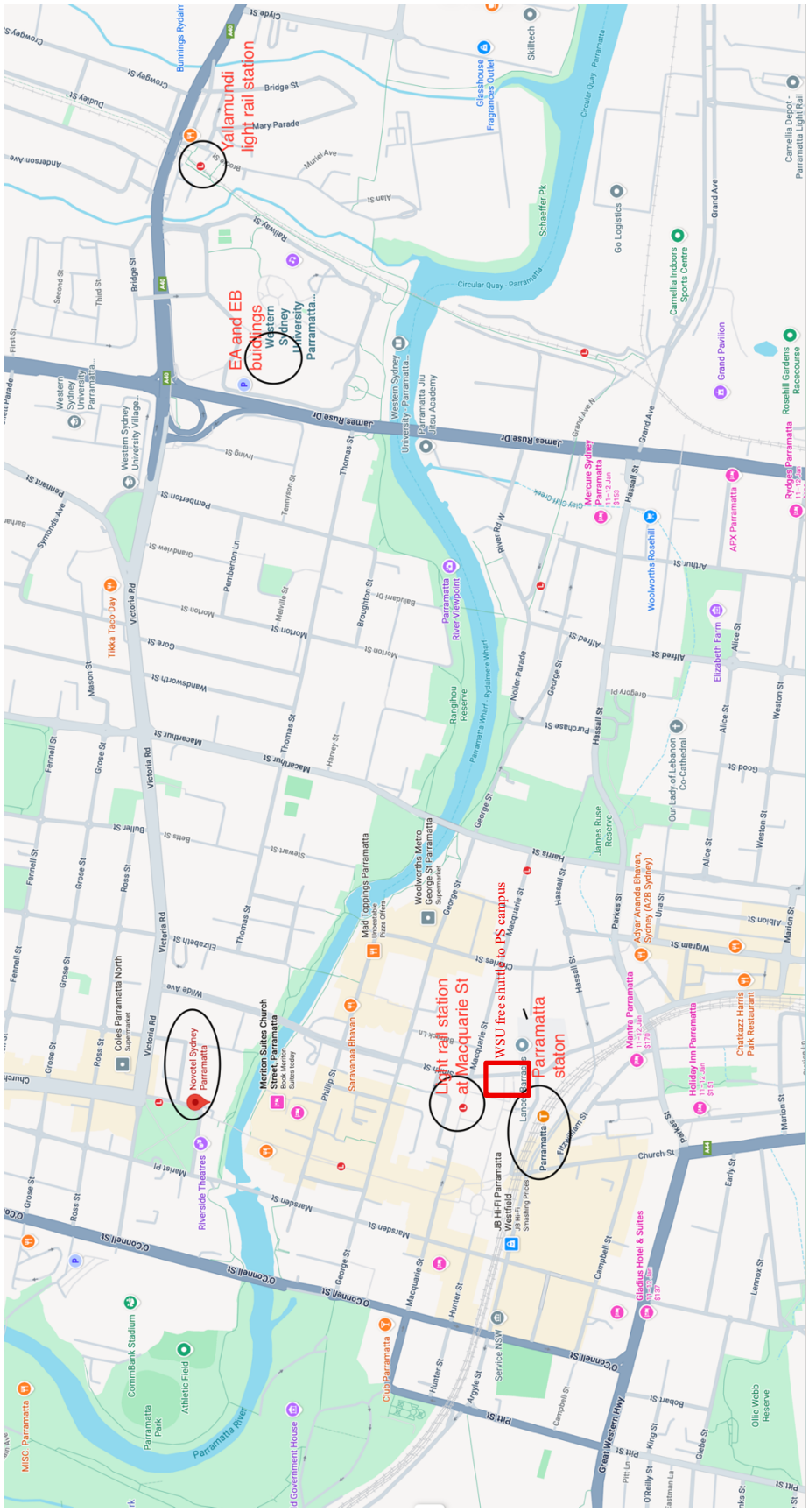
Date
26-28 November 2025

Venue
Buildings EA and EB, Parramatta South Campus, Western Sydney University (map), Corner of James Ruse Drive and Victoria Road, Parramatta, NSW 2117, Australia.

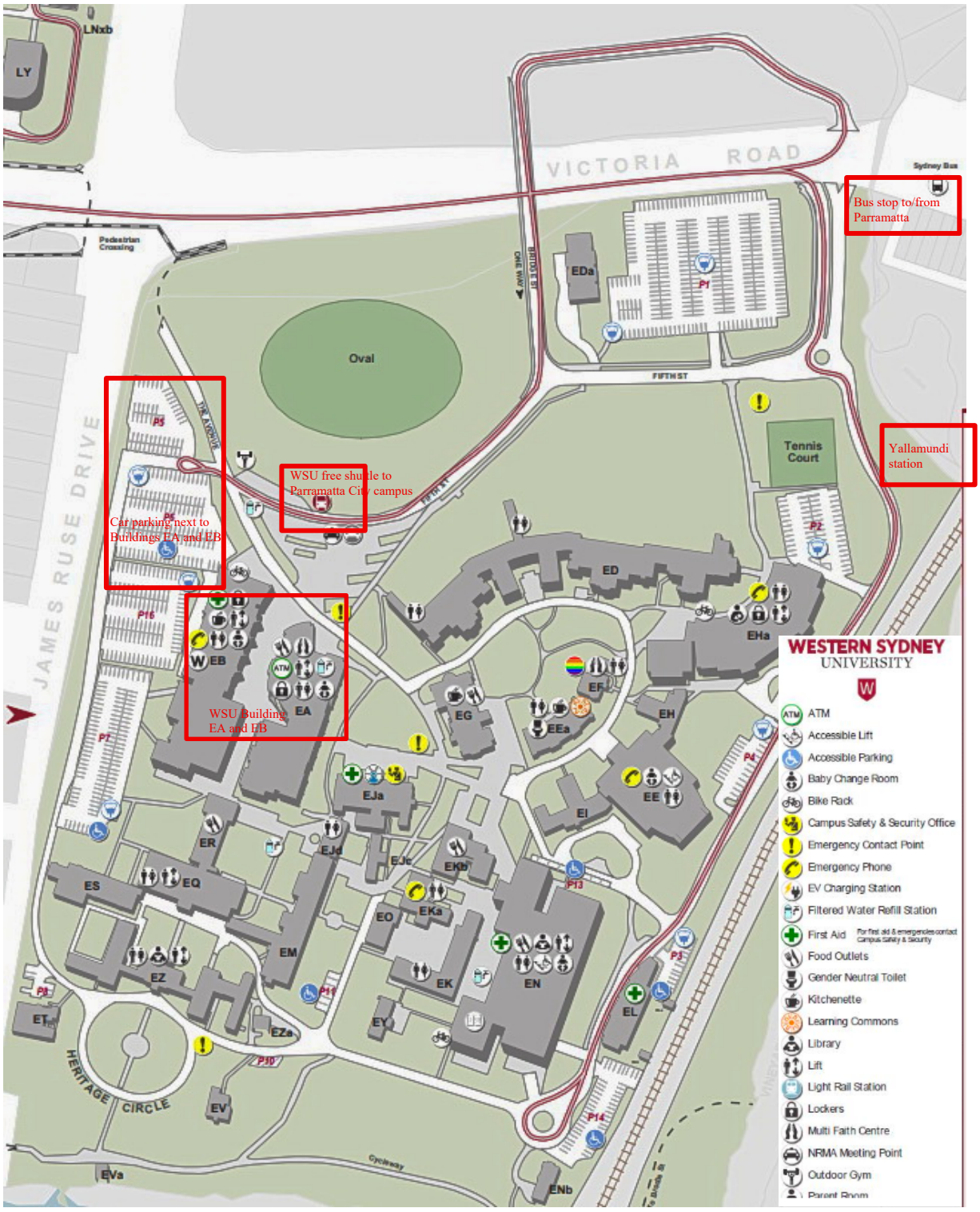
Transport Information
WSU Parramatta South Campus is about 2 km away from Parramatta Station. You can get the campus by one of the following transport options:

1. **Light rail (L4)** from Macquire Square station (map) to Yallamundi station (map).
2. **Bus (501, 521, 523, 524, 525)** from Parramatta station (Stand A3, map) to the stop of Victoria Road before Railway Street (map).
3. **WSU free shuttle bus** from Parramatta City Campus on Smith St (map) to Parramatta South Campus in front of EA/EB buildings (map).
4. **By car**, drive in through Railway Street and then Fifth Street to WSU Parramatta South Campus (car parking, map).

Car parking
We have arranged some daily car parking permits at WSU Parramatta South Campus, which will be provided to keynote and invited speakers. For other participants, we may provide car parking permits as needed, or you can park on streets for free (e.g., Irving St, Tennyson St).



Map of Parramatta Station, WSU Parramatta South Campus and Novotel Parramatta Sydney



Map of Parramatta South Campus, Western Sydney University