The 27th Australasian Conference on the Mechanics of Structures and Materials (ACMSM27)

25 - 28 November 2025

Melbourne, Australia

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THE UNIVERSITY OF MELBOURNE

SWINBURNE UNIVERSITY OF TECHNOLOGY

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Welcome to ACMSM27

Womin Djeka (Welcome)!

We are delighted to invite you to the 27th Australasian Conference on the Mechanics of Structures and Materials (ACMSM27), which will take place from 25 to 28 November 2025 at Swinburne University of Technology (Hawthorn Campus) in Melbourne, Australia.

The series of ACMSM was first held in Sydney, Australia in 1967. This is one of the longest running reputable conferences in the field taking place very two or three years within Australia and New Zealand. Jointly organised by The University of Melbourne and Swinburne University of Technology, ACMSM27 promises to be an exciting forum for researchers, practitioners, and industry professionals to share the latest advancements and insights in the mechanics of structures and materials.

Building on a longstanding tradition of excellence, ACMSM27 has received over 120 paper submissions, including 10 selected for publication in a Special Issue of the Australian Journal of Structural Engineering and 50 to appear in Lecture Notes in Civil Engineering. This year's conference has attracted more than 120 delegates from around the world, representing countries such as the United Kingdom, Italy, France, Romania, the Czech Republic, Poland, India, China, and many others.

Over the three-day program, we are proud to feature five plenary keynote lectures delivered by Prof Brian Uy, Prof Guo-Qiang Li, A/Prof Christian Málaga-Chuquitaype, Dr Troy Coyle, and A/Prof Costantino Menna. The program also includes 22 technical sessions (including two special sessions) showcasing 96 presentations across a broad spectrum of topics in mechanics of structures and materials.

We look forward to welcoming you to ACMSM27 and to an inspiring exchange of ideas that will shape the future of our field.

Warmest regards,

Professor Tai Thai, Associate Professor Jessey Lee
On behalf of the ACMSM27 Organising Committee

Co-Chairs

Prof Tai Thai
The University of Melbourne
Co-Chair

A/Prof Jessey Lee
Swinburne University of Technology
Co-Chair

Local Organising Committee

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The University of Melbourne

A/Prof Javad Heshemi
Swinburne University of Technology

Dr Elisa Lumantarna
The University of Melbourne

Dr Shanqing Xu
Swinburne University of Technology

Dr Shuangmin Shi
The University of Melbourne

Dr Weibai Li
Swinburne University of Technology

The 27th Australasian Conference on the Mechanics of Structures and Materials (ACMSM27)
Melbourne, Australia, 2025

International Scientific Committee

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Debes Bhattacharyya	The University of Auckland, New Zealand
Boglárka Bokor	Hilti Group
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Guo-Qiang Li	Tongji University, China
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Hao Wang	University of Southern Queensland, Australia
Hendrik Wijaya	Swinburne University of Technology, Australia
Yong Xia	The Hong Kong Polytechnic University, Hong Kong, China
Ben Young	The Hong Kong Polytechnic University, Hong Kong, China
Chunwei Zhang	Shenyang University of Technology, China
Yan Zhuge	University of South Australia, Australia

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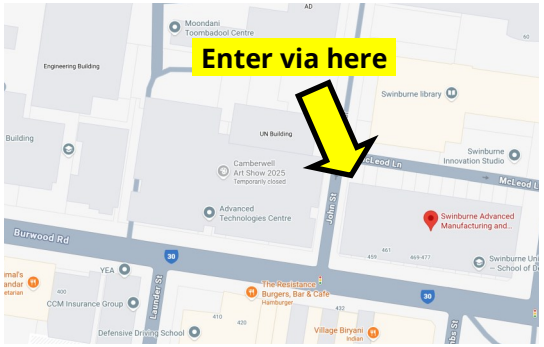
Conference Venue

All ACMSM27 sessions will be held with in-person attendance at the Hawthorn Campus of Swinburne University of Technology. The venue is in the Advanced Manufacturing and Design Centre (AMDC) Building, located at 453 Burwood Rd, Hawthorn, VIC 3122, Australia.

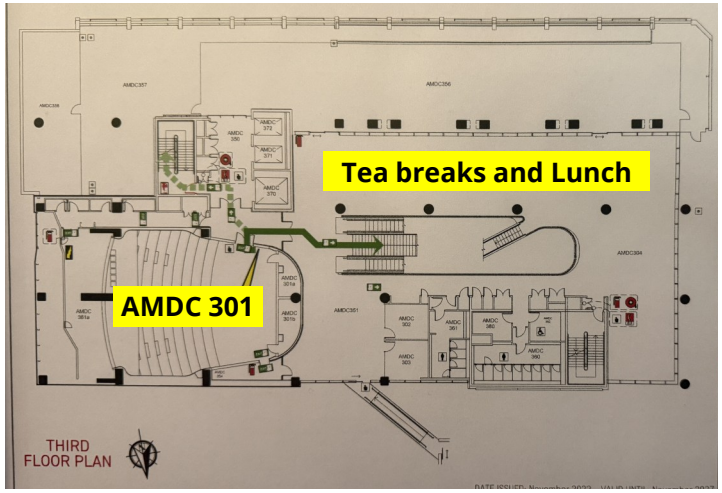


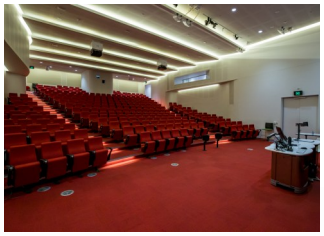
Enter through the glass sliding doors and take elevators to Level 3:

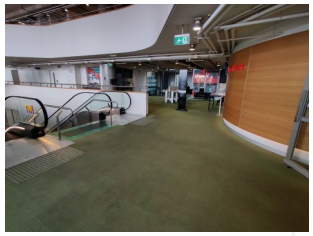
Conference Venue

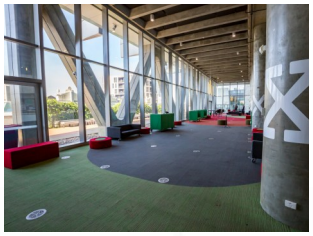
AMDC Building Level 3

Foyer and Lounge: Registration Desks, Tea Breaks and Lunch
AMDC 301: Opening Ceremony, Keynote Sessions, Closing Ceremony









The 27th Australasian Conference on the Mechanics of Structures and Materials (ACMSM27)
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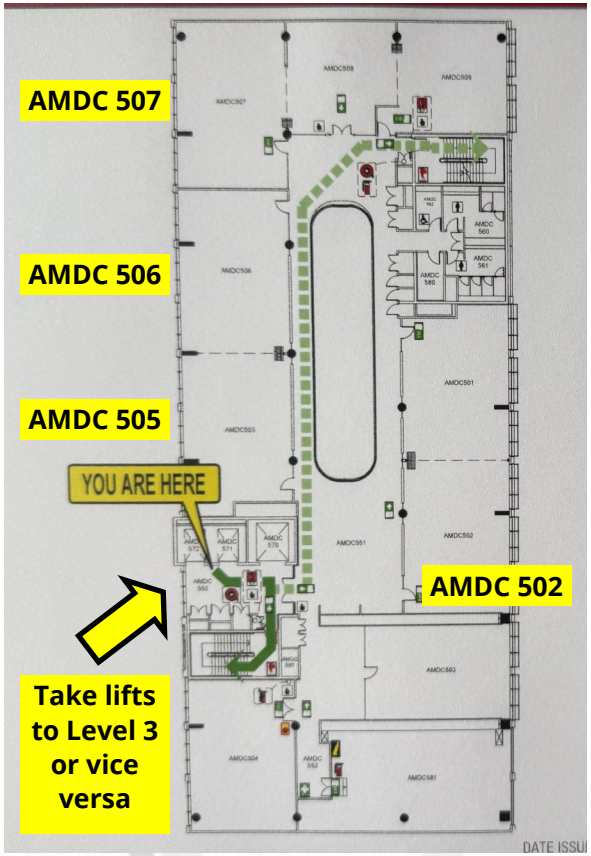
Conference Venue

AMDC Building Level 5

AMDC 505, 506, 507: Parallel Sessions
AMDC 502: Help Desk and File Preparation Room



Need Help?

Ask one of the ACMSM27 Volunteers wearing:

Other Useful Information

Registration

Registration will be in the foyer at Level 3 of AMDC Building from 2 PM to 5 PM on 25 November 2025. The registration desk will be open during conference, starting from 8:30 AM every day.

Transport

Public Transport – Trains

The conference venue is around 5 minutes' walk from Glenferrie Station. Please visit the Public Transport Victoria (PTV) website https://www.ptv.vic.gov.au/ to help plan your journey and to ensure that your journey will not be impacted by scheduled maintenance.

Parking

If you're coming by car or motorcycle, all-day ticketed parking is available on campus. There are also ticketed off-campus car parks and on-street parking.

Wi-Fi Access

The wireless network for the ACMSM27 will be available:

Network: Events@Swin ***Password***: swin0325

You can also connect to the **eduroam** wireless network if you are from a participating eduroam institution using your login credentials (username and password) and security settings from your home institution. You will need to enter your full username including domain/realm (e.g. jsmith@inst.edu.au).

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ACMSM27 Conference Program Overview

Day 0, 25 November 2025		
14:00-19:00	Registration and Reception	*AMDC Foyer/Hawthorn Hotel*
Day 1, 26 November 2025		
9:00-9:30	Conference Opening Ceremony	*AMDC 301*
9:30-10:00	Plenary Lecture	*AMDC 301*
10:00-10:30	Plenary Lecture	*AMDC 301*
10:30-11:00	Morning Tea	*AMDC Lounge*
11:00-12:30	Parallel Sessions	*AMDC 505~507*
12:30-13:30	Lunch	*AMDC Lounge*
13:30-15:00	Parallel Sessions	*AMDC 505~507*
15:00-15:30	Afternoon Tea	*AMDC Lounge*
15:30-17:00	Parallel Sessions	*AMDC 505~507*
17:30-18:30	Swinburne Engineering Labs Tour	*Registration required*
Day 2, 27 November 2025		
9:30-10:00	Plenary Lecture	*AMDC 301*
10:00-10:30	Plenary Lecture	*AMDC 301*
10:30-11:00	Morning Tea	*AMDC Lounge*
11:00-12:30	Parallel Sessions	*AMDC 505~507*
12:30-13:30	Lunch	*AMDC Lounge*
13:30-15:00	Parallel Sessions	*AMDC 505~507*
15:00-15:30	Afternoon Tea	*AMDC Lounge*
15:30-17:00	Parallel Sessions	*AMDC 505~507*
18:00-22:00	Conference Banquet	*Rydges Hotel*
Day 3, 28 November 2025		
9:00-9:30	Plenary Lecture	*AMDC 301*
9:30-10:00	Morning Tea	*AMDC Lounge*
10:00-11:30	Parallel Sessions	*AMDC 505~507*
11:30-12:00	Award and Closing Ceremony	*AMDC 301*
12:00-13:00	Light Lunch	*AMDC Lounge*
13:00-15:00	Victorian Tunnelling Centre Tour	*Registration required*
Note: Each presentation is limited to 15 mins talk + 2 mins Q&A		

Welcome Reception (25 November)

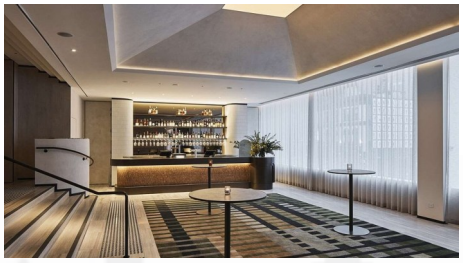
A welcome reception will be held on 25 November (Day 0), from 5 PM to 7 PM, at Hawthorn Hotel (481 Burwood Rd), next to AMDC Building.

Conference Banquet (27 November)

The Conference Banquet will be held on 27 November (Day 2), from 6 PM to 10 PM, at Rydges Hotel in Melbourne CBD (186 Exhibition St, Melbourne VIC 3000).

Shuttle bus (return) will be provided between Swinburne Hawthorn Campus and Rydges Hotel. Please follow on-site instructions to get onboard.

Departure: 5:15 PM
Return: 9:30 PM



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Swinburne Engineering Lab Tours (*registered only*)

Please follow on-site instructions if you have registered for the Swinburne Engineering Lab Tours.

Victorian Tunnelling Centre Tours (*registered only*)

Shuttle bus (return) will be provided between Swinburne Hawthorn Campus and Victorian Tunnelling Centre. Please follow on-site instructions if you have registered for this tour.

Day 1: Wednesday 26 November 2025	
9:00 - 9:30	**Opening Ceremony (Venue: AMDC 301)**
	ACMSM27 Co-Chairs Welcome: Prof Tai Thai and A/Prof Jessey Lee **Welcome to the Country**: Wurundjeri Elder Uncle Colin Hunter Jnr **Opening Remarks**: Prof Karen Hapgood, *Deputy Vice-Chancellor (Research), Swinburne University of Technology* **Opening Remarks**: Prof Mark Cassidy, *Deputy Vice-Chancellor (Research), The University of Melbourne* **Briefing and Program Highlights**: A/Prof Jessey Lee
9:30 - 10:00	**Plenary Lecture (Venue: AMDC 301)** ***Chair: Prof Mark Stewart, University of Technology Sydney, Australia***
	Past, present and future foci for the mechanics of structures and materials: Steel-concrete composite construction ***Abstract*** *This keynote paper reflects on the key foci in the area of the mechanics of structures and materials in the past, present and future. The paper commemorates the First Australasian Conference on the Mechanics of Structures and Materials (ACMSM) at The University of New South Wales from August 21-23, 1967. The paper then reflects on the key issues in the area of the mechanics of structures and materials at present and posits what will be some of the key issues for the future. Using the area of steel-concrete composite construction, the issues of the mechanics of structures and materials will be further highlighted in relation to real applications in the past, present and future.* **Prof Brian Uy** *The University of New South Wales Sydney (UNSW Sydney), Australia* ***Bio*** *Brian Uy is Scientia (Distinguished) Professor of Structural Engineering in the School of Civil and Environmental Engineering at the University of New South Wales. Brian has delivered over 100 plenary/keynote/invited lectures and has been involved in research in steel and composite structures for over 35 years. He has co-authored over 700 publications including over 300 refereed journal articles. Brian is Chairman of the Standards Australia Committee BD-032 on Composite Building Structures and BD-090-06 on Steel and Composite Bridge Structures and Chief Editor (Asia-Pacific) of Steel and Composite Structures. He is currently President-Elect and Vice President of the Institution of Structural Engineers (IStructE) and will become the 105th President of IStructE in 2026. Brian is also the Australian Chairman and Vice President of the International Association of Bridge and Structural Engineering (IABSE). Brian is an elected Fellow of the Australian Academy of Technological Sciences and Engineering, Engineers Australia, Royal Society of NSW, Institution of Structural Engineers, Institution of Civil Engineers, American Society of Civil Engineers, Structural Engineering Institute and the International Association of Bridge and Structural Engineers.* 

Day 1: Wednesday 26 November 2025	
10:00 - 10:30	**Plenary Lecture (Venue: AMDC 301)** ***Chair: Prof Hong Guan, Griffith University, Australia***
	Approach for early-warning fire-induced collapse of steel buildings ***Abstract*** *The unexpected collapse of burning buildings has been a major killer of firefighters, since current techniques are very hard to accurately evaluate the collapse risk of a real building in fire. Developing a practical approach for early-warning fire-induced collapse of steel buildings in real-time is an urgent need, as these buildings account for a large part of collapse accidents due to severe degradation of steel mechanical properties at elevated temperatures in fire. The uncertainties of a burning building, such as load levels and heating conditions which differ from designed values, and the real-time acquisition of its structural responses to fire are two challenging issues need to be addressed. Through parametric analysis of collapse mechanisms considering uncertainties in real fire, the limited potential collapse modes of steel portal frames and steel trusses popularly used for steel buildings are identified. Displacement responses of the burning building at key positions of the building structure, identified as Key Physical Parameters (KPPs), are selected for early warning fire-induced building collapse, as these displacements exhibit unique variation patterns for each collapse mode. Three-level early-warning strategy is proposed based on evolution laws of KPPs during the process of the building collapse. As some KPPs are hard to be measured directly in fire scene, especially for those located on the roof or inside the building, real-time acquisition method of the hard-to-measure KPPs through easy-to-measure data are investigated. Considering the close correlation between rotations and displacements at structural nodes at definite temperatures, pre-embedded thermocouples and inclinometers, which are easily employed in practice, are proposed to facilitate the real-time acquisition of hard-to-measure KPPs. Real fire tests have been conducted to verify the effectiveness of the approach for early-warning fire-induced collapse of steel portal frame and steel truss buildings.* **Prof Guo-Qiang Li** *Tongji University, China* ***Bio*** *Guo-Qiang Li is a distinguished professor of structural engineering in Tongji University, the director of Research Centre of Education Ministry of China for Steel Construction and the director of National Research Centre of China for Pre-fabrication Construction. He is also a vice-chairman of Chinese Society of Steel Construction and a vice-chairman of Chinese Association of Construction Standardization. In addition, he is a foreign member of the Royal Flemish Academy of Belgium for Science and the Arts, a fellow of Institution of Structural Engineers in UK and a fellow of the Council of Tall Buildings and Urban Habitat.* 
10:30 - 11:00	**Group Photo and Morning Tea Break (Venue: AMDC Level 3 Lounge)**

Day 1: Wednesday 26 November 2025			
11:00 - 12:30	**Parallel Session 1: Computational analysis and simulation-based design (Venue: AMDC 505)** ***Chair: Prof Muhammad Hadi***	**Parallel Session 2: Structural health monitoring and infrastructure lifecycle management (Venue: AMDC 506)** ***Chair: Dr Jianjun Zhang***	**Parallel Session 3: Computational modelling, optimisation and reliability (Venue: AMDC 507)** ***Chair: Prof Karoly Jarmai***
11:00 - 11:17	#1: Topology-optimized supercavities supporting optical bound states in the continuum **Dr Weibai Li** *Swinburne University of Technology*	#33: Dynamic testing and system identification of a long-span multi-story building using roving instrumentation setups **Dr Kaveh Andisheh** *HERA New Zealand*	#88: Use of structural reliability principles in building regulation and standards **Prof Lam Pham** *Swinburne University of Technology*
11:17 - 11:34	#12: Correlating binder chemistry with solid mechanics of cementitious materials **Dr Yuguo Yu** *RMIT University*	#107: Structural evaluation of a 1971 reinforced concrete building with limited documentation: A hybrid experimental-numerical approach **Mr Aliakbar Yaghoubzadehfard** *The University of Melbourne*	#25: Performance of a ducted cross-flow turbine with different blade configurations for marine current energy extraction **Dr Jai Goundar** *The University of the South Pacific*
11:34 - 11:51	#35: Finite element analysis of reinforced concrete beam under fatigue loading: A simplified approach **Mr Danny Triputra Setiamanah** *Institut Teknologi Sepuluh Nopember*	#39: Improved mask R-CNN for tunnel rock saturation degree and seepage area detection **Mr Shuai Zhang** *The University of Melbourne; Hainan University*	#16: Computer vision-based floor plan analysis for automated structural optimisation and seismic assessment of buildings **Mr Prashidha Khatiwada** *The University of Melbourne*
11:51 - 12:08	#10: Modelling capillary pore connectivity in textile fibre-reinforced concrete **Mr Hasika Dharmasooriya** *RMIT University*	#37: Numerical simulation of ship dynamic motion and structural response for structural health monitoring **Mr Ahmed Nisham** *The University of Newcastle*	#99: The role of TechnoLab™ mini experiments in enhancing the experiential learning of basic mechanics **Dr Nicholas Haritos** *Swinburne University of Technology; The University of Melbourne; STRUCOMP P/L*
12:30 - 13:30	**Lunch (Venue: AMDC Level 3 Lounge)**		

Day 1: Wednesday 26 November 2025			
13:30 - 15:00	**Parallel Session 4: Concrete technology and innovation in cementitious materials (Venue: AMDC 505)** ***Chair: Prof Xing Ma***	**Parallel Session 5: Resilient design against natural and man-made hazard (Venue: AMDC 506)** ***Chair: Prof Lam Pham***	**Parallel Session 6: Seismic and wind actions (Venue: AMDC 507)** ***Chair: Prof Cosmin Chiorean***
13:30 - 13:47	#95: Mechanical properties of epoxy-based mortars incorporating coal bottom ash, recycled aggregates and fibres **Dr Shahrizan Baharom** *Universiti Kebangsaan Malaysia*	#116: Climate adaptation and resilience for structural systems **Prof Mark Stewart** *University of Technology Sydney*	#51: Eccentric braced frames: Seismic response and design challenges **Mrs Maryam Hasanali** *HERA New Zealand*
13:47 - 14:04	#81: Uniaxial tensile strength and fracture energy of one-part ambient-cured geopolymer concrete **Mr Daro Sun** *Swinburne University of Technology*	#90: Influence of structural aspect ratio on the blast response of shaped concrete units **Dr Sreekumar Punnappilly** *National Institute of Technology*	#93: Linearization approach for overturning risk assessment of tendon-restrained rocking isolated modular buildings **Mr Deelaka Jayaweerarathne** *The University of Melbourne*
14:04 - 14:21	#50: A new classification and readiness assessment framework for self-healing concrete technologies **Mr Yiping Qiao** *The University of Queensland*	#100: Numerical assessment of honeycomb cushions for impact protection of RC bridge girders **Dr Javad Hashemi** *Swinburne University of Technology*	#63: Seismic performance of mid-rise composite modular buildings **Mr Omar Morsy** *The University of Melbourne*
14:21 - 14:38	#23: Sludge-based composite for rapid self-healing cementitious materials in CO2-rich environment **Mr Hossein Sanaei Ataabadi** *University of South Australia*	#7: Repair of critical jetty members utilising in-situ application of CFRP **Mr Liam McGurdy** *Fuze Group*	#36: Predicting time-dependent wind pressure on tall buildings using machine learning **Mr Pasindu Meddage** *The University of New South Wales*
14:38 - 14:55	#69: Experimental study of mechanical properties of rubberized recycled aggregate concrete-filled steel tube components **Mr Zheyuan Cao** *University of South Australia*	#58: Hail resistance of high strength dry-cast roofing **Dr Ruizhe Shao** *University of Technology Sydney*	#15: Simulation of downburst wind flow over different terrain categories **Dr Elsayed Abdel Aal Metwally** *University of South Australia*
15:00 - 15:30	**Afternoon Tea Break (Venue: AMDC Level 3 Lounge)**		

Day 1: Wednesday 26 November 2025			
15:30 - 17:00	**Parallel Session 7: Masonry and timber structures (Venue: AMDC 505)** ***Chair: A/Prof Christian Málaga-Chuquitaype***	**Parallel Session 8: Advanced materials and FRP (Venue: AMDC 506)** ***Chair: Arjun Kandel***	**Parallel Session 9: Impact, blast, and ballistic loadings (Venue: AMDC 507)** ***Chair: Prof Alex Remennikov***
15:30 - 15:47	#117: Characteristic values in timber engineering **Prof Lam Pham** *Swinburne University of Technology*	#47: Stress relaxation prediction of basalt fibre reinforced polymer (BFRP) under flexural loads based on time series parameter method **Prof Xing Ma** *University of South Australia*	#11: Large deformation behaviour of lattice structure in compression: Experiments, finite element analysis and analytical modelling **Dr Jianjun Zhang** *Western Sydney University*
15:47 - 16:04	#87: New development in testing and evaluation of timber connections **Dr Anita Amirsardari** *Swinburne University of Technology*	#79: Experimental investigation on structural strengthening of shear-deficient RC deep beams using ultra high-performance fiber reinforced concrete (UHPFRC) **Prof Kushan Wijesundara** *University of Peradeniya*	#61: Numerical investigation of hydrogen-air cloud detonation: Validation with field experiment and effect of equivalence ratio on overpressure **Dr Kasun Wijesooriya** *The University of New South Wales*
16:04 - 16:21	#49: A method for estimating resilience of aging veneer and cavity masonry walls **Mr Chee Yin Lam** *The University of Newcastle*	#57: Optimizing UHPFRC performance: a study on hybrid steel fibre blends and their mechanical-microstructural effects **Dr Mudassir Iqbal** *The Hong Kong Polytechnic University*	#60: Experimental investigation of laboratory-scale hydrogen deflagration explosions **Mr Zhenying Huang** *University of Wollongong*
16:21 - 16:38	#46: The impact of corrosion on the behaviour and strength of wall ties in cavity brick walls. **Ms Lyndsey Terry** *The University of Newcastle*	#77: Numerical investigation of a syntactic foam layer for enhancing load distribution and durability in FRP deck system **Mr Khaja Kamal Fayaz Ahmed** *Indian Institute of Technology Hyderabad*	#28: Experimental analysis of projectiles expelled from mine openings due to underground coal mine explosions **Mr Edwin Gan** *University of Wollongong*
16:38 - 16:55	#48: Condition assessment of wall ties in masonry cavity wall using vibration-based methods **Mr Chee Yin Lam** *The University of Newcastle*	#64: An autoencoder-based approach for barely visible impact damage detection in CFRP panels **Mr Sina Mansourdehghan** *University of Western Australia*	#31: Using artificial intelligence in the blast load prediction of unconfined hydrogen deflagrations **Mr Kirilous Gindie** *University of Wollongong*
17:00	**Day 1 Concludes**		
17:30 - 18:30	**Swinburne Engineering Labs Tour (*registered only*)**		

Day 2: Thursday 27 November 2025	
9:30 - 10:00	**Plenary Lecture (Venue: AMDC 301)** ***Chair: Prof Pat Rajeev, Swinburne University of Technology, Australia***
	Rock 'n' Roll Dynamics: Rotational motion strategies for structural resilience in timber and beyond ***Abstract*** *This lecture explores how controlled rocking, rolling isolation, and rotational inertial devices are reshaping dynamic control strategies for building structures, with special focus on their application to modern timber systems. It examines how stepping away from traditional fixed-base assumptions, embracing motion, and harnessing inertial forces to our advantage can enable efficient, low-damage solutions for seismic protection. The talk will delve into the fundamental mechanics and emerging engineering concepts behind rocking and rolling systems, highlight the role of inerters as force amplifiers and "size shifters," and demonstrate how their integration enhances seismic performance. Special emphasis will be laced on how these strategies are unlocking the seismic potential of engineered timber structures. Drawing on recent advances in numerical modelling and experimental earthquake engineering, this lecture invites you to view seismic control not as a battle against motion, but as a carefully choreographed rock 'n' roll performance allowing timber to play a starring role in the next generation of resilient, sustainable structures.*
	A/Prof Christian Málaga-Chuquitaype *Imperial College London, UK* ***Bio*** *Christian Málaga-Chuquitaype is an Associate Professor in Dynamics and Seismic Engineering in the Department of Civil and Environmental Engineering at Imperial College London. He leads the department's efforts in earthquake engineering, and is actively involved in teaching, specialist advisory work, and guiding a diverse research group focused on emerging structural technologies. His research interests span structural testing, computational modelling, AI, and the assessment of structures under extreme conditions—from earthquake-prone regions to extra-terrestrial environments. Christian serves as an Associate Editor for two international journals, sits on several other editorial boards, and contributes to multiple code committees involved in international standards development and the advancement of engineering practice. His work has been recognised with several awards, including the Best Research Paper Prize from the Institution of Structural Engineers (IStructE), the Tso Kung Hsieh Award from the Institution of Civil Engineers (ICE), and the Unwin Prize from Imperial College London.* 

Day 2: Thursday 27 November 2025	
10:00 - 10:30	**Plenary Lecture (Venue: AMDC 301)** ***Chair: Prof Chien Ming Wang, The University of Queensland, Australia***
	Which matters more? Excellence or Impact? ***Abstract*** *Engineering research intersects with societal and industrial demands, making it foundationally impact-led. This presentation will explore how to identify impact-led research opportunities, build research capability and sectoral impact. HERA, a small independent research association in Aotearoa New Zealand, will be used as the case study to show that even small teams can have meaningful research impact.*
	Dr Troy Coyle *HERA (Heavy Engineering Research Association), New Zealand* ***Bio*** *Troy is the CEO of HERA, an impact-led independent research association based in Aotearoa New Zealand. She is also the Co-Chair of Hanga-Aro-Rau (the Workforce Development Council for Manufacturing, Engineering and Logistics) and a Director of the Sustainable Steel Council, Steel Construction New Zealand and HERA Certifications. She is an Impact Assessor for the Endeavour program and holds advisory board roles for the Ministry of Innovation, Business and Employment (Building System Performance), Auckland University of Technology and the University of Auckland. She is the Impact Leader and creator of HERA's $10.3 million funded Construction 4.0 project and is passionate about impact-led research, with a particular focus on sustainability, indigenous knowledge, diversity and inclusion, and industry transformation.* 
10:30 - 11:00	**Morning Tea Break (Venue: AMDC Level 3 Lounge)**

Day 2: Thursday 27 November 2025			
11:00 - 12:30	**Parallel Session 10: Computational mechanics and metamaterials (Venue: AMDC 505)**	**Parallel Session 11: Structural health monitoring and infrastructure lifecycle management (Venue: AMDC 506)**	**Parallel Session 12: Steel and cold-formed structures (Venue: AMDC 507)**
	Chair: Dr Da Chen	***Chair: Prof Jun Li***	***Chair: Dr Shanqing Xu***
11:00 - 11:17	#119: Mechanical performance of 3D printed continues fibre-reinforced composite metamaterials **Prof Dong Ruan** *Swinburne University of Technology*	#108: Sustainability evaluation of foundation systems: A comparative life cycle analysis of screw piles and bored piers **Prof Pat Rajeev** *Swinburne University of Technology*	#66: Experimental study of transversely loaded fillet welds for seismic actions **Dr Shahab Ramhormozian** *Auckland University of Technology*
11:17 - 11:34	#20: Numerical homogenisation of porous composite materials via Scaled Boundary Finite Element Method **Dr Da Chen** *The University of New South Wales*	#6: Modelling reinforcement corrosion initiation time in silica fume concrete sea walls using random field theory **Dr Yanni Bouras** *Victoria University*	#114: Numerical Study on the Hollow-core FRP-concrete-steel Column Against Close-in Blast Load **Prof Weiqiang Wang** *Hohai University*
11:34 - 11:51	#38: Energy absorption characteristics of menger fractal cubes **Dr Kasun Wijesooriya** *The University of New South Wales*	#106: Fibre optic based structural health monitoring of interfacial disbond evolution in bonded FRP-steel systems **Mr Sriram Ravisankar Padma** *The University of Western Australia*	#24: A Detailed Investigation of Cracking in Multi-Span Simply Supported Beam Bridges via SolidWorks Analysis **Mr Syed Musarat Hussain** *Shenyang University of Technology*
11:51 - 12:08	#89: Effect of the density gradient on the mechanical behaviour of an architectured material under dynamic loading **Mr Manish Kumar** *The University of New South Wales*	#111: Bayesian service life prediction of RC bridges affected by pitting corrosion **Mr Aliakbar Yaghoubzadehfard** *The University of Melbourne*	#68: Vibration properties of a steel building with friction sliding system **Mr Gholamreza Hashemi** *Auckland University of Technology*
12:30 - 13:30	**Lunch (Venue: AMDC Level 3 Lounge)**		

Day 2: Thursday 27 November 2025			
13:30 - 15:00	**Parallel Session 13: Fire and thermal engineering (Venue: AMDC 505)**	**Parallel Session 14: Connections and fastening technology (Venue: AMDC 506)**	**Parallel Session 15: Sustainable and low-carbon construction materials (Venue: AMDC 507)**
	Chair: Prof Priyan Mendis	***Chair: Dr Shahab Ramhormozian***	***Chair: Prof Hailong Ye***
13:30 - 13:47	#4: Novel thermal barrier coatings with polymer-derived ceramic interlayers for jet engine critical components **Prof Andrzej Nowotnik** *Rzeszow University of Technology*	#109: Future perspectives in building: The role of connections in view of a consilient approach **Prof Giovanni Muciaccia** *Politecnico di Milano*	#74: Potential for developing alkali activated glass-based foam using waste PV glass **Dr Ailar Hajimohammadi** *The University of New South Wales*
13:47 - 14:04	#43: Refined nonlinear flexibility-based model for fire performance assessment of RC and composite members **Prof Cosmin Chiorean** *Technical University of Cluj-Napoca*	#86: Effect of head-to-shank ratio on concrete-cone capacity of cast-in headed fasteners **Dr Tilak Pokharel** *Swinburne University of Technology*	#73: Use of rice straw biochar as alternative SCM to fly ash **Dr Han Gao** *The University of New South Wales*
14:04 - 14:21	#103: A novel technique of fire protection of externally bonded FRP laminate: use of vermiculite mortar plaster along with moisture barrier coating **Mr Khaja Kamal Fayaz Ahmed** *Indian Institute of Technology Hyderabad*	#34: Assessing the durability of timber-steel hybrid continuous connections through accelerated aging tests **Mr Abdulaziz Abdulmalik** *Griffith University*	#5: Thermal conductivity in low-carbon mortar and concrete using supervised machine learning algorithms **Dr Yanni Bouras** *Victoria University*
14:21 - 14:38	#98: Elevated temperature thermal properties of foam concrete for fire resistant walls **Mr Branavan Arulmoly** *Queensland University of Technology*	#126: Proposed carbonation-induced corrosion investigation of precast concrete grout tube connections **Mr Arif Ullah** *Swinburne University of Technology*	#91: Implementing sense 600® to reduce embodied carbon in reinforced concrete: A case study from a water infrastructure facility **Dr Echo Wang** *National Transport Research Organisation (NTRO)*
14:38 - 14:55	#112: Hybrid fibre reinforced magnesium oxychloride cement-based composites: A fire-resistant solution for cladding applications **Mr Farhan Ahmad** *Western Sydney University*	#94: Development of fire test set-up for fasteners in Australia **Ms Ishani Lankadhikara** *Swinburne University of Technology*	#71: Evaluation of Delithiated Beta Spodumene (DBS) as a supplementary cementitious material **Dr Mohammed Alnahhal** *The University of New South Wales*
15:00 - 15:30	**Afternoon Tea Break (Venue: AMDC Level 3 Lounge)**		

Day 2: Thursday 27 November 2025				
15:30 - 17:00	**Parallel Session 16: Steel and cold -formed structures (Venue: AMDC 505)**	**Parallel Session 17: Sustainable and low-carbon construction materials (Venue: AMDC 506)**	**Special Session 1: Mechanics of structures and materials in the era of data intelligence (Venue: AMDC 507)**	**Special Session 2: Structural reliability in engineering (Venue: AMDC 501)**
	Chair: Dr Tilak Pokharel	***Chair: Dr Ailar Hajimohammadi***	***Chair: Dr Miao Li***	***Chair: Dr Anita Amirsardari***
15:30 - 15:47	#110: Analysis of industrial steel storage pallet racks to assess sensitivity to progressive collapse **Prof Elide Nastri** *University of Salerno*	#3: Integrated carbon emission assessment of lightweight ultra-high-performance concrete for MiC high-rise buildings from material to building **Prof Hailong Ye** *The University of Hong Kong*	#75: Bridge construction risks in complex environments - a hybrid analytic hierarchy process and optimised neural network model **Dr Miao Li** *Charles Sturt University*	**Introduction** **Prof Lam Pham** *Swinburne University of Technology* **Panel Discussions** **Prof Mark Stewart**, *University of Technology Sydney* - ***Reliability*** **A/Prof Colin Caprani**, *Monash University* - ***Reliability*** **A/Prof Matthew Mason**, *The University of Queensland* - ***Wind*** **Dr Scott Menegon**, *Swinburne University of Technology* - ***Earthquake*** **Mr Ken Watson**, *National Association of Steel Framed Housing (NASH)* - ***Steel*** **Dr Anita Amirsardari**, *Swinburne University of Technology* - ***Timber*** **Floor Open for Discussion** **Close Remark** **Prof Lam Pham** *Swinburne University of Technology*
15:47 - 16:04	#30: Optimisation of welded structures, minimising cost and harmful environmental effects **Prof Karoly Jarmai** *University of Miskolc*	#102: Effect of surfactant type on foam film stability in alkali-activated materials **Ms Xiufen Yang** *The University of Hong Kong*	#42: An investigation of causal relationships between intensity measures and rocking response via interpretable machine learning **Mr Stefan Chu** *The Hong Kong University of Science and Technology*	
16:04 - 16:21	#8: Design recommendation for bolted circular hollow section flange -plate connections **Mr Ian Kennedy** *University of Toronto*	#101: Ultra-low carbon alkali-activated slag using carbon-captured sodium carbonate activator **Ms Junhan Liu** *The University of Hong Kong*	#62: Experiment-aided virtual modelling framework for elastoplastic analysis of auxetic honeycombs with stochastic mechanical **Mr Yuhang Tian** *The University of New South Wales*	
16:21 - 16:38	#96: Investigation of compression and tension capacity of mono helix piles in cohesive soils **Mr Biju Balakrishnan** *Swinburne University of Technology*	#56: Mitigation of alkali-silica reaction in waste glass-based hybrid alkaline mortar **Mrs Aida Rahmani** *Western Sydney University*	#80: Machine learning modelling for mechanical properties prediction and multi-objective optimization of eco-friendly rubberized concrete **Mr Ming Yu** *The University of New South Wales*	
16:38 - 16:55	#83: Material modelling for cold-formed steels **Mr Lahiru Dissanayake** *Imperial College London*	#59: Exploring baghouse dust as a reactive component in alkali-activated mortars **Mr Ahmed Alnahhal** *The University of New South Wales*	#40: Bridging the gap: Machine learning literacy among Indonesian construction stakeholders **Dr Angga Trisna Yudhistira** *Universitas Gadjah Mada*	
17:00	**Day 2 Concludes**			
18:00 - 12:00	**Conference Banquet (Venue: Rydges Hotel, 186 Exhibition St, Melbourne VIC 3000)**			

Day 3: Friday 28 November 2025	
9:00 - 9:30	**Plenary Lecture (Venue: AMDC 301)** ***Chair: Prof Yan Zhuge, University of South Australia, Australia***
	Multiscale mechanics and structural performance of 3D-printed concrete: Interfaces, modelling strategies, and full-scale application ***Abstract*** *3D concrete printing (3DCP) is rapidly transitioning from experimental technology to a viable construction method, yet its structural reliability still depends on a deeper understanding of the multiscale mechanics governing printed materials. Unlike conventional cast concrete, 3D-printed components exhibit direction-dependent behaviour, interlayer interfaces, and process-driven heterogeneities that directly influence their stiffness, strength, fracture patterns, and long-term performance. This keynote presents an integrated experimental–numerical framework aimed at characterizing and predicting the behaviour of structural 3D-printed concrete across multiple scales. At the material and meso-scale, the talk will examine the role of interlayer bonding, printing path, and interface geometry on mechanical anisotropy, crack initiation, and failure mechanisms. Experimental results from coupon, wall, and panel tests will be combined with finite element simulations, including interface-based simulations capable of capturing the layered nature of printed elements. At the structural scale, the keynote will focus on the validation of unreinforced 3D-printed panels, combining analytical modelling, nonlinear FEM simulations, and full-scale testing. These panels were later used to design and construct the first 3D-printed earthquake-resistant structure in Italy. Insights from this project illustrate how material characterization, interface modelling, and structural design can converge toward reliable digital construction workflows.*
	A/Prof Costantino Menna *University of Naples Federico II, Italy* ***Bio*** *Costantino Menna is an Associate Professor of Structural Engineering at the University of Naples Federico II (Department of Structures for Engineering and Architecture). His research focuses on advanced materials and structures, finite element modeling in civil and biomedical engineering, digital fabrication, and sustainability in construction. He has extensive experience in numerical simulation of complex structural systems, with applications ranging from civil infrastructure to biomechanics. He has carried out research at leading international institutions, including Penn State University (USA), École Polytechnique (France), and École Polytechnique de Montréal (Canada). He has authored more than 60 scientific publications and holds 10 patents on innovative structural materials and systems. Prof. Menna's work explores the mechanics and modelling of 3D-printed concrete, particularly addressing structural performance, durability, and design integration. He led the design and realization of the first 3D-printed earthquake-resistant structure in Italy, developed in collaboration with Enel Green Power. He also coordinates several national and European research projects on non-linear behaviour of biomaterials, life-cycle performance, and low-carbon construction technologies. He serves as Chair of the fib Task Group 2.11 on Structures made by Digital Fabrication, Leader of the fib Special Activity Group on Sustainability (TG.SAG.1), and Member of RILEM Technical Committees on 3D printing in concrete construction, as well as of the EAEE (European Association for Earthquake Engineering (EAEE) Working Group 15. He co-authored the Italian Civil Protection (ReLUIS) national guidelines on integrated seismic and energy retrofitting. In 2021, he was appointed External Expert for the European Parliament's pilot project on seismic and energy upgrading (Joint Research Centre, European Commission), and was included in the Stanford–Elsevier global ranking of the world's top scientists in both 2023 and 2025.*
	
9:30 - 10:00	**Morning Tea Break (Venue: AMDC Level 3 Lounge)**

Day 3: Friday 28 November 2025			
10:00 - 11:30	**Parallel Session 18: Sustainable and low-carbon construction materials (Venue: AMDC 505)**	**Parallel Session 19: Sustainable and low-carbon construction materials (Venue: AMDC 506)**	**Parallel Session 20: Connections and fastening technology (Venue: AMDC 507)**
	Chair: Prof Kushan Wijesundara	***Chair: Dr Shaoyu Zhao***	***Chair: Prof Giovanni Muciaccia***
10:00 - 10:17	#44: Recycled plastics as modified binders for road construction **Dr Jai Goundar** *The University of the South Pacific*	#122: Influence of steel fibre shape and content on ultra-high -performance alkali-activated concrete **Prof Muhammad Hadi** *University of Wollongong*	#76: Evaluation of high-strength shear connector design in AS/NZS 2327:2017 and AS/NZS 5100.6:2017 **Dr Yifan Zhou** *University of Western Australia*
10:17 - 10:34	#82: Compressive strength of concrete bricks with recycled crumbed rubber **Dr Sarkar Noor-E-Khuda** *Central Queensland University*	#52: Numerical study of the pullout behaviour variability of recycled steel fibres **Mr Vito Lokito** *The University of Melbourne*	#123: Tensile test of post-installed screw anchors in thin uncracked steel fibre-reinforced concrete **Mr Lieu Thai Ng** *Swinburne University of Technology (Malaysia)*
10:34 - 10:51	#9: Microstructural and thermal behaviour of geopolymer paste incorporating Electric Arc Furnace (EAF) slag **Mr Kamal Kishore** *University of Wollongong*	#13: Enhancing mechanical and durability properties of concrete using recycled pet fibres **Ms Vidarshi Suraweera** *RMIT University*	#72: Development of seismic test setup for fasteners in high-strength concrete **Mr Prayush Rajbhandari** *Swinburne University of Technology*
10:51 - 11:08	#70: Structural performance of railway sleepers reinforced with aqua-thermally treated crumb rubber aggregates and recycled tire steel fibres **Mr Sanjaya B.G.V** *RMIT University*	#14: Experimental study of thermal properties of textile fibre -reinforced mortar **Mrs K.A.P Wijesinghe** *RMIT University*	#26: Slip modulus of multi-culm bamboo members with steel bolted connections **Ms Nahid Khodabakhshi** *The Hong Kong University of Science and Technology*
11:30 - 12:00	**Closing Ceremony (Venue: AMDC 301)**		
12:00 - 13:00	**Light Lunch (Venue: AMDC Level 3 Lounge)**		
13:00 - 15:00	**Victorian Tunnelling Centre Tour (*registered only*)**		

Notes

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Melbourne, Australia, 2025

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