

# IMPACT

MAGAZINE OF THE AUSTRALIAN ACADEMY OF TECHNOLOGICAL SCIENCES & ENGINEERING

ATSE.ORG.AU

NUMBER 218 | 2025

ATSE

50  
YEARS

Australian Academy of  
Technological Sciences  
& Engineering  
1975-2025

## Activating global innovation

A sustainable world for  
future generations



The Academy acknowledges the Traditional Owners of the lands on which we meet and work and we pay our respects to Elders past and present. We recognise the deep knowledge and practices embedded in the oldest continuous culture on the planet. Australia's history of engineering, technology and applied science spans more than 60,000 years.



#### PUBLISHER

#### Australian Academy of Technological Sciences & Engineering

We are a Learned Academy of independent experts. We bring together Australia's leading experts in applied science, technology and engineering to provide impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

#### ADDRESS

Level 2, 28 National Circuit  
Forrest ACT 2603  
PO Box 4776  
Kingston ACT 2604

#### TELEPHONE

+61 2 6185 3240

#### EMAIL

communications@atse.org.au

#### CEO

Kylie Walker

#### EDITORIAL TEAM

Adam Huttner-Koros  
Rebecca Rohan-Jones

#### DESIGN

Elizabeth Geddes

#### ISSN

2207-8223 (electronic)

#### COPYRIGHT

© Australian Academy of Technological Sciences & Engineering

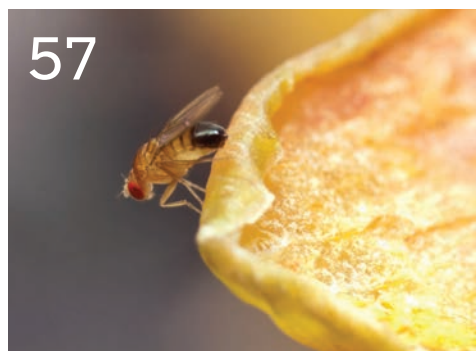
May 2025

[atse.org.au](http://atse.org.au)

Cover image: Maldives coral restoration coral propagation steel frame to attach broken coral fragments for re-planting on the reef to avoid coral bleaching. Source: iStock.



Australian Academy of Technological Sciences & Engineering  
1975-2025



#### FEATURES

##### 9 Boosting Australia's innovation

Distinguished Professor Saeid Nahavandi FTSE and Dr Dornan AO FTSE

##### 15 CAETS 2025 Generations

##### 19 Making communities safer through water knowledge and collaboration

Maryam Farzadkhoo

##### 23 ATSE New Fellows 2024

##### 35 ATSE Awards 2024

##### 47 Global Science and Diplomacy Fund – Strategic Element

##### 57 Global impact through Australian fruit fly innovation

Professor Richard Drew FTSE

##### 59 Academic volunteering across the Indo-Pacific

Emeritus Professor Graham Schaffer FTSE



#### REGULAR CONTENT

##### 3 From the President's desk

##### 7 Welcome from the CEO

##### 61 Strategic advice

##### 63 Movers and shakers

##### 67 Vale

##### 69 What we're reading

##### 71 Publications by ATSE Fellows



The Australian Academy of Technological Sciences & Engineering supports the United Nations' Sustainable Development Goals (SDGs). The wheel symbol (above) is shown when an article relates to one or more SDG. The SDGs are explained at the back of this digital magazine.



## President's introduction



**Dr Katherine Woodthorpe**  
AO FTSE FAICD

Dr Woodthorpe is President of the Australian Academy of Technological Sciences & Engineering and a Fellow of the Australian Institute of Company Directors. She holds a PhD in Chemistry (Manchester) and an Honorary Doctorate from the University of Technology Sydney. In 2017, she received an Order of Australia for her ongoing service to research and technology innovation in Australia. Dr Woodthorpe has a strong track record of achieving outcomes in a range of technology-oriented industries, including medical devices and health services, and a deep knowledge of governance, leadership and the private equity and financial sectors.

▲ Elected 2015

THE WORK OF engineers, applied scientists and technologists is global. This has never been more true than it is now, at a time of technological disruption, geopolitical uncertainty and innovation opportunities.

In this first issue of ATSE's IMPACT magazine for 2025, we look forward to a big year for our Academy with a global focus and an international agenda. We are celebrating our new Fellows and Awardees announced at the end of 2024, highlighting some of our deserving grant recipients, looking at fruit fly management in South-East Asia and engineering education in the Pacific, and putting the spotlight on a high achieving early career engineer and STEM advocate.

You'll find examples in these pages of the kinds of global collaborations that are helping us solve complex challenges and build technology capacity nationally and in our region. New electrodes for reducing CO<sub>2</sub> emissions from chemical manufacturing, prefabricated panels for efficient and quick housing construction, and creating hydrogen using sunlight:- these are some examples of the projects our Fellows and others around the world are leading.

ATSE has been busy over the past months, contributing significantly to the national conversation on innovation with our Boosting Australia's Innovation report. This go-to guide for

policymakers and organisational leaders was built on input from hundreds of researchers, business leaders and policy professionals. It outlines a set of actionable recommendations that Australia can implement right now to grow our economy through support for our workforce and our R&D ecosystem.

This issue also spotlights our latest cohort of Fellows, and the celebratory New Fellows Showcase they took part in, in Melbourne in October. Our new Fellows cover disciplines as varied as carbon accounting, Indigenous genomics, health policy, agriculture technology and sustainable materials. Their expertise is already proving a valuable asset for ATSE. We are so proud of our more than 900 Fellows, for continuing to provide the evidence base and networks that can grow our impact and our ability to support effective national decision making.

We are looking forward to gathering with you and leaders from around the world at **CAETS 2025: Generations**, the sustainability conference we are hosting in Brisbane in September to position Australia as a global leader in engineering and applied science.

This edition of IMPACT highlights a number of ATSE impacts that will manifest across the year. I hope you enjoy reading these articles and take their message of innovation and global collaboration with you. ▲

CAETS<sup>2025</sup>

# Generations

An international symposium shaping a sustainable future in 50 years

BRISBANE | AUSTRALIA | 8-11 SEPTEMBER 2025

PRESENTED BY



Australian Academy of  
Technological Sciences  
& Engineering  
1975-2025

GET YOUR TICKET TODAY

[caets2025.org](https://caets2025.org)

Help us showcase  
Australian STEM  
on the world stage  
Join us in Brisbane  
this September






**ATSE  
AWARDS**  
2025

# Nominations close 13 May

The nationally prestigious ATSE Awards recognise Australian excellence across a range of STEM disciplines.



## CLUNIES ROSS TECHNOLOGY INNOVATION AWARDS




Recognising contributions by dedicated individuals or teams who have shared their vision and knowledge with others to apply technology for the benefit of Australia, and beyond.

## BATTERHAM MEDAL FOR ENGINEERING EXCELLENCE



An early career award for a graduate engineer who has achieved substantial peer or industry recognition for their work in the past five years.

## EZIO RIZZARDO POLYMER SCHOLARSHIP




A scholarship prize acknowledging the potential impact of an outstanding PhD candidate in polymer science or engineering at eligible universities.

## DAVID & VALERIE SOLOMON AWARD



An early-mid career award for a science or technology graduate working in academia or industry who demonstrates substantial ability to foster research-industry collaboration and knowledge transfer for the benefit of Australia.

## TRADITIONAL KNOWLEDGE INNOVATION AWARD



Acknowledging and recognising up to two teams or individuals respectfully, collaboratively and successfully applying Traditional Knowledge through modern innovation.

[atse.org.au/awards](https://atse.org.au/awards)





Australian Academy of  
Technological Sciences  
& Engineering  
1975-2025

# ATSE New Fellows Showcase and ATSE Awards 2025

**30 October 2025**

National Wine Centre, Adelaide

**NEW  
FELLOWS**

**ATSE  
AWARDS**

ATSE New Fellows  
Welcome Reception  
Wednesday 29 October  
Evening

ATSE New Fellows  
Showcase  
Thursday 30 October  
Daytime

ATSE Awards 2025  
Gala Dinner  
Thursday 30 October  
Evening

National Wine Centre  
Adelaide, South Australia

**REGISTER**  
[atse.org.au/events](https://atse.org.au/events)



# Problem-solvers and renegades

## The Australian Academy of Technological Sciences & Engineering held its first meeting on 21 November 1975.

Problem-solvers and renegades, the 65 Foundation Fellows launched from the Australian Academy of Science to pursue their vision of an Academy of hands-on innovators; an industry-facing Academy with a clear remit to build a better future. Sadly, only one remains – David Solomon. I wonder if those Founding Fellows could have imagined what ATSE would be today?

In our 50th year, we remain firmly grounded in history – but not just of this Academy: Ours is a history that extends back to the mid-17th century, to our ‘mother’, the Australian Academy of Science, and to our ‘grandmother’, the Royal Society of London. And, just as those earliest Founders then envisaged, we continue today, to maintain a steady gaze toward the future.

Exceptional achievement and leadership, innovation in technological sciences and engineering, and outstanding contributions at the interface between technology and society are still defining qualities for selection of Fellows, and intrinsic features of the work we do.

But while our core identity and purpose have stayed the same, so much has changed through the five decades since our inaugural President Sir Ian MacLennan and the other Founders first met. Active Divisions have sprung up in every state and territory;

we’ve amassed a deep, diverse library of publications articulating optimistic and technologically-empowered visions across the breadth of Australian endeavour; we’ve directly impacted the education of hundreds of thousands of school children, awakening their intellects to the wonders of engineering; we’ve mentored, provided development for, and celebrated the wins of an astonishing array of young innovators and up-and-coming leaders; and we’re supporting Australian innovators to spread their wings internationally with global partners to commercialise their technology.

ATSE has a proud history of providing independent evidence-based and expert-driven advice to leaders at all levels of government and business; an admirable track-record in challenging and necessary thinking; and extensive experience envisaging future challenges.

Even a cursory glance at the ATSE canon reveals such forward-thinking expositions such as a sustainable energy roadmap crafted in 1977; a vision for turning food waste to profit in 1980; a 1984 handbook for building future computer-enabled industries; and in 1992 an examination of the threats and opportunities brought by globalisation of technology; in 1985, a blueprint for building an Australian space sector. In 2004 we laid out how water recycling could support sustainability; in 2008 we examined the potential for a range of biofuels for long-haul transport; and in 2010 we forecast the future of technology to support our ageing population. More recently, in 2017 ATSE drafted a blueprint for the role of energy storage in ensuring continuity of supply during an energy transition;

laid out a national framework for electrification of transport in 2019; and in 2020 conjured a vision of a genuinely digitally connected and enabled healthcare system.

We’re still pushing the nation’s thinking into the future, whether examining nuclear power technologies, advising on options for decommissioning offshore oil and gas infrastructure, crafting a new approach to water security in remote communities, or guiding national decisions on guardrails for artificial intelligence. ATSE’s Fellowship and ATSE’s work today continues to be founded on excellence, rigour, relevance and practicality – and aims to inform, educate, and guide all Australians to understand and use technology to solve complex problems.

The Foundation Fellows may be surprised at our numbers today – more than 900 Fellows and 33 staff! I’d like to think they’d not be so surprised about our impact, the breadth of our work, and the myriad ways in which we’ve influenced decision-makers to act on evidence, encouraged industry to be bold in applying new technologies and tackle new markets, and inspired students to pursue careers in engineering and technological sciences. And I hope they’d approve of our plans this year to bring together peers from around the world to share ideas and innovations, and to imagine our next 50 years and beyond.

I look forward to celebrating with you, our Fellows, throughout the year – as we stand together on the foundations of the past, and look to a connected, sustainable, tech-enabled future. ▲



**Kylie Walker**  
Chief Executive Officer

Kylie Walker is the CEO of the Australian Academy of Technological Sciences & Engineering. She works with Australia’s leaders in applied science, technology and engineering to advise decision makers, lead crucial national conversations to solve complex challenges, and support Australia’s technology-powered, human-driven future.





# Boosting Australia's innovation

By Distinguished Professor Saeid Nahavandi FTSE and Dr Dimity Dornan AO FTSE

When we talk about economic drivers to improve productivity and reignite our national growth from pre-pandemic days, innovation is at the centre.



INNOVATION BY ITS very nature drives our research and development, and as a result, governments need to place it at the centre of a long-term strategic and economic push.

They need to focus our collective efforts on how well-thought-out and implemented innovation can address productivity gaps across sectors. Yet despite the clear need for a coordinated approach, numerous barriers hinder progress – particularly in Australia. Removing these barriers requires a coordinated approach across government, academia and industry. We need to step up and consider funding mechanisms, regulatory challenges, market limitations and talent acquisition constraints.

As the Minister for Science and Industry Ed Husic made clear at the National Press Club in February, Australian research has huge potential that we aren't turning into reality. Other countries have used their innovations for social and economic gain, but much of what is invented in Australia is being taken overseas to be commercialised.

In our roles as speech pathology and defence robotics experts, and as Fellows of the Australian Academy of Technological Sciences and Engineering, we see every day, the transformative impact of innovation on people's lives. Developing the evidence base around speech therapy and Cochlear implants has helped improve medical treatments and change the lives of children experiencing extreme hearing loss. This is the kind of progress that Australian innovation makes. And the impact is felt around the world.

Roundtable discussions over the past 18 months, attended by hundreds of senior technology and innovation leaders from industry, government, academia and peak bodies, provided actionable insights we have compiled into a go-to guide for enhancing R&D capabilities in Australia. ATSE's *Practical steps for boosting Australia's innovation ecosystem* report makes clear exactly how, together, we can once again grow this foundational feature of a competitive and productive economy.

A significant barrier to shifting the innovation dial in Australia is insufficient and inconsistent funding. Many promising ideas fail to transition from concept to commercialisation due to a lack of financial support.

Governments and industry both have a role to play in growing Australia's investment in R&D. At all stages of the innovation process, financial support grows skills, technologies, new businesses and future-ready workforces. In Australia, gaps in venture capital availability, particularly for early-stage start-ups and deep-tech companies, hinder firms from growing and scaling up.

Government grants and subsidies tend to operate on short-term cycles, limiting the ability to pursue long-term, high-impact projects. Short-term funding cycles also misalign with the long-term nature of innovation. In fields like clean energy, biotechnology and advanced manufacturing, breakthroughs require sustained investment over many years.

ATSE Fellow Professor Andrew Blakers' solar cells innovations in the 1970s and 1980s have transformed the world. Today, half of all solar cells in use in the world are based on the designs he and his colleagues pioneered decades ago. Support at the start of the process yields dividends in both short and long term. To reach transformative outcomes, we have to maintain investments, supporting both early and over time.

In rapidly evolving sectors such as artificial intelligence (AI), biotechnology, and renewable energy, the lack of adaptive regulatory frameworks makes it difficult for innovators to keep pace with global advancements. This is compellingly evident.

There is a lot we can do to improve on our global innovation scorecard. As reported by the World Economic Forum, Australia ranks 23rd out of 133 national economies on the Global Innovation Index, and we are not in the top three in our region. We come in at 22 out of the 51 high-income economies.

Additionally, fragmented policies across our federated system of government create inconsistencies in how innovation receives uplift and fit-for-purpose regulation.

Even when innovation turns into reality, innovative products and services often struggle to gain market traction. Successful scalability of commercial products comes to pass only when innovation actors align their research focus with market needs. In turn, this can drive tangible impact and maximise the return on their innovation investments. Cue effective government and industry



**Distinguished Professor Saeid Nahavandi**  
FTSE

Distinguished Professor Nahavandi is currently Swinburne University of Technology's inaugural Associate Deputy Vice-Chancellor Research and Chief of Defence Innovation. His research interests include autonomous systems, modeling of complex systems, robotics and haptics. Saeid was the recipient of the ATSE Awards Clunies Ross Entrepreneur of the Year Award in 2022; Researcher of the Year for Australian Space Awards 2021, Australian Defence Industry Awards; Winner of Innovator of the year, The Essington Lewis Awards; and Australian Engineering Excellence Awards, Professional Engineer of the Year.

▲ Elected 2019



**Dr Dimity Dornan**  
AO FTSE

Dr Dornan is a social entrepreneur, bionics advocate, speech pathologist, researcher, Founder and Director of Hear and Say, Founder and Chair of Bionics Queensland and past member of Senate of the University of Queensland. Dimity has also been appointed to Adjunct Professor to the University of Queensland School of Health and Rehabilitation Sciences and Adjunct Professor to the Science and Engineering Faculty, School of Mechanical, Medical & Process Engineering, Queensland University of Technology, and is a member of the Advisory Board for the ARC Industrial Transformation Training Centre—Joint Biomechanics.

▲ Elected 2016



**UN SDGs**  
8 – Decent work and economic growth  
9 – Industry, innovation and infrastructure





Left: ATSE Fellow Professor Andrew Blakers AO FTSE FAA with his ATSE Award – the Clunies Ross Technology Innovation Award 2024. Professor Blaker's solar cells innovations in the 1970s and 1980s have transformed the world. Today, half of all solar cells in use in the world are based on the designs he and his colleagues pioneered decades ago.

## READ THE REPORT

### Boosting Australia's innovation



support. Governments and large-scale enterprises can play a key role as early adopters by purchasing innovative solutions. Yet procurement policies often favour established players over start-ups and hinder small and medium enterprises (SMEs).

Australian businesses face difficulties in scaling up and accessing global markets due to trade barriers, logistical constraints and a lack of international networks. Compared with the US, China and the EU, Australia has fewer mechanisms in place to integrate SMEs into global supply chains, limiting their ability to expand beyond the domestic market.

A shortage of highly skilled workers in key industries such as advanced manufacturing, AI, and quantum computing poses a major innovation challenge. The competition for global talent is intense, and Australian visa restrictions, limited career pathways and competitive salary structures make it hard to attract and retain top researchers and technical experts.

Additionally, gaps in Science, Technology, Engineering, and Mathematics (STEM) education and training mean that many graduates lack the practical skills needed for high-tech industries. Strengthening university-industry collaborations, and expanding apprenticeship and re-skilling programs, would help bridge this gap

and ensure a steady pipeline of innovation-ready STEM talent.

Australia's business and investment culture tends to be more risk-averse compared with other innovation-driven economies. Many investors prioritise short-term returns over long-term innovation, making it challenging for start-ups to secure funding for high-risk, high-reward ventures.

This hesitancy contrasts with ecosystems like Silicon Valley, where venture capitalists are more willing to fund bold, disruptive ideas.

Addressing these barriers requires a multifaceted approach that includes long-term funding mechanisms such as stable, multi-year funding programs to support high-risk, high-reward innovation. Governments should implement adaptive regulations that keep pace with technological advancements and reduce bureaucratic red tape. Investments in talent, procurement policies, financing, performance measurement and education can transform the Australian technology and innovation landscape.

The outcome of all this will be a resilient, responsive and powerful sector underpinning our future health and safety. The next Cochlear implant, cancer screening test and AI technologies are out there – we need to create the system to unearth them. ►

# Innovation Report

## A roadmap for the innovation ecosystem

Australia stands at a critical juncture in its journey to boost the national innovation ecosystem. Institutional reform, targeted investment, increased collaboration and improved evaluation will create an innovation sector that can commercialise, iterate, experiment and develop the technologies to support better lives in Australia and around the world.

### Strategies

**Drawing on expert consultations over 5 years, this report presents key insights and strategies for the government, research institutes, investors and businesses to revitalise the Australian innovation landscape.**



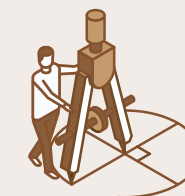
### Balancing the economic and public value of outcomes

Commercial outcomes are crucial for a sustainable ecosystem but not all research or innovation is destined for the marketplace. The ecosystem should recognise in its funding and strategic decision-making that the value of knowledge creation extends beyond immediate economic returns and that there are beneficial applications of knowledge without commercial outcomes.



### Long-term policy horizons

Successful industrial policy implementation requires a long-term perspective beyond current political cycles. To achieve significant 'moonshots', the government should support a combination of horizontal and vertical policy programs. These should be underpinned by stable, CPI-adjusted funding that promotes sustainable research and innovation pipelines over time.



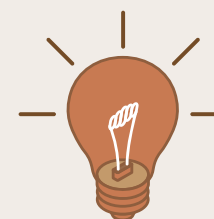
### A non-linear innovation pipeline

To truly drive innovation, we must embrace a non-linear approach, one that is not direct from research to market. It involves iterative discovery, development and application cycles, with frequent feedback loops. By fostering a culture of experimentation, embracing failure as a learning opportunity and prioritising agile methodologies, we can unlock the full potential of our innovation efforts.



### Differing incentive structures

Obstacles to collaboration arise from differing incentives, bureaucratic hurdles, concerns over intellectual property ownership in joint projects and the absence of established frameworks to manage collaboration with different innovation actors. To foster a thriving innovation ecosystem, we must establish clear policy frameworks that address these obstacles.



### Fundamental discovery as a bedrock

Fundamental research forms the foundation for building current and future industries. While not immediately commercialised or translated, it leads to improved societal impacts that help inform the policy and practices essential for long-term innovation.

To ensure long-term viability, consolidation of overlapping initiatives – wherever sensible – can streamline resources and maximise impact.



### Support for varied organisational capacities

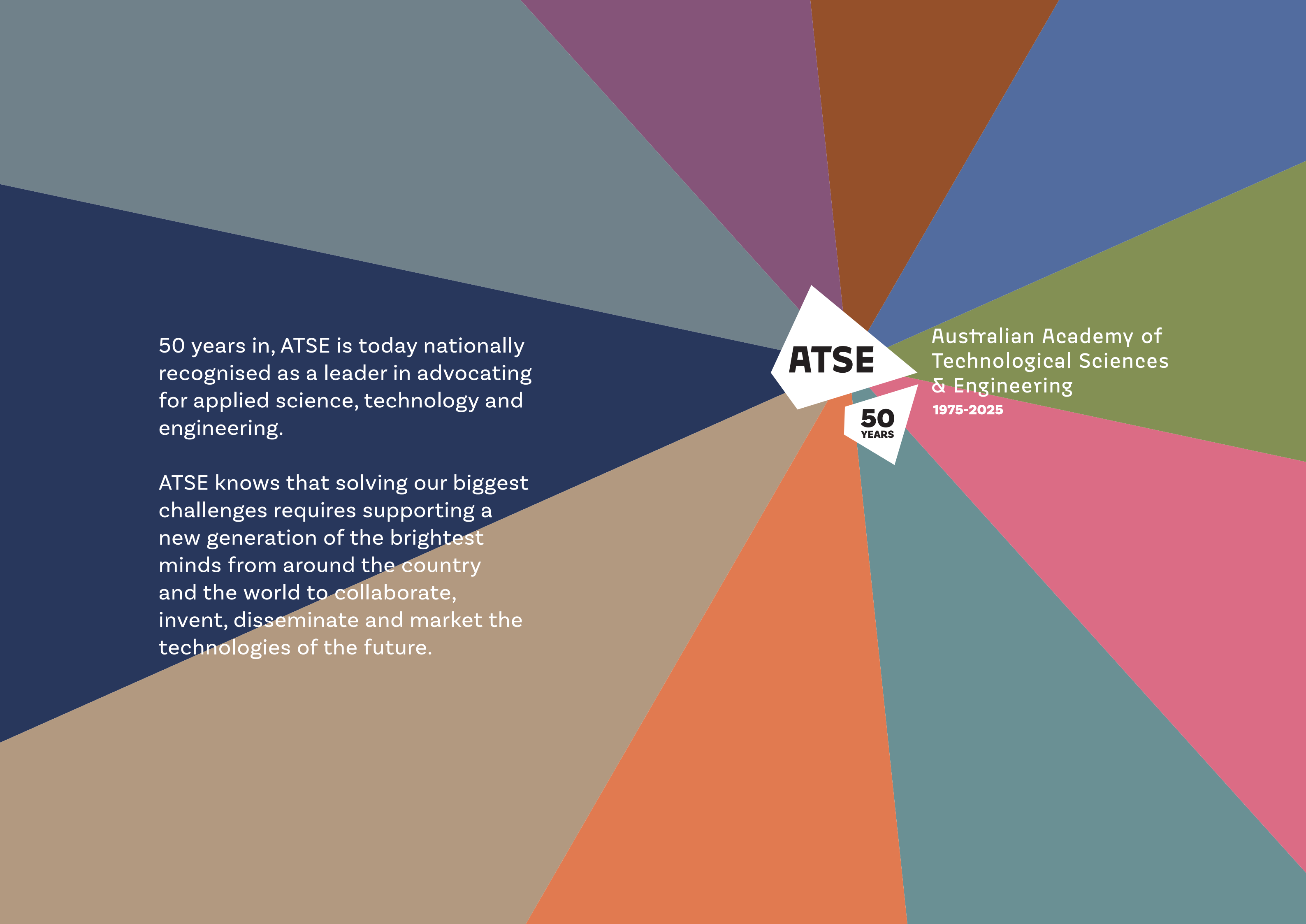
Universities, research organisations and NGOs possess varying levels of back-office expertise in governance, legal, risk and intellectual property management. Creating a centralised resource hub offering access to knowledge, advice and best practices on commercialisation, legal matters, and funding opportunities would ensure all players can navigate the innovation landscape effectively, regardless of size.



### Market-driven success

True innovation is driven by market needs. Successful scaling of commercial products is realised only when a specific challenge is solved in a market with willing customers. Innovation actors aligning their research efforts with market needs can drive tangible impact and maximise the return on our innovation investments.





50 years in, ATSE is today nationally recognised as a leader in advocating for applied science, technology and engineering.

ATSE knows that solving our biggest challenges requires supporting a new generation of the brightest minds from around the country and the world to collaborate, invent, disseminate and market the technologies of the future.

**ATSE**

**50  
YEARS**

Australian Academy of  
Technological Sciences  
& Engineering

**1975-2025**





# Welcome back to the southern hemisphere

When the annual conference of the International Council of Academies of Engineering and Technological Sciences (CAETS) first came to Australia back in 2006, ATSE was in its third decade.

In our 50th anniversary year, we welcome back the CAETS annual conference as its host. This is not only an opportunity to connect with global peers, but also to showcase to our CAETS member academies the trajectory, depth and breadth of Australian-based innovation in research and development.

When we last hosted, the world had seen in the new millennia, the Y2K bug was behind us and we were seeing a renewable energy boom in Australia unfold before our eyes.

Once again, we are afforded the opportunity to host this prestigious event. It will take place in the home of the 2032 Olympics in Brisbane, with a sitting CAETS President in Dr Katherine Woodthorpe AO FTSE FAICD.

Dr Woodthorpe is also generating important international collaborations on the back of the decades of work that have taken place in a multiplicity of ways across the Fellowship.

Global thought leaders across engineering, technological sciences and innovation will gather from many of the 33 CAETS Academies. The symposium will hone in on sustainability and practical solutions at the intersection of discovery, implementation and society. ▶

➔ REGISTER FOR CAETS 2025

**CAETS 2025: Generations**  
An international symposium shaping a sustainable future in 50 years

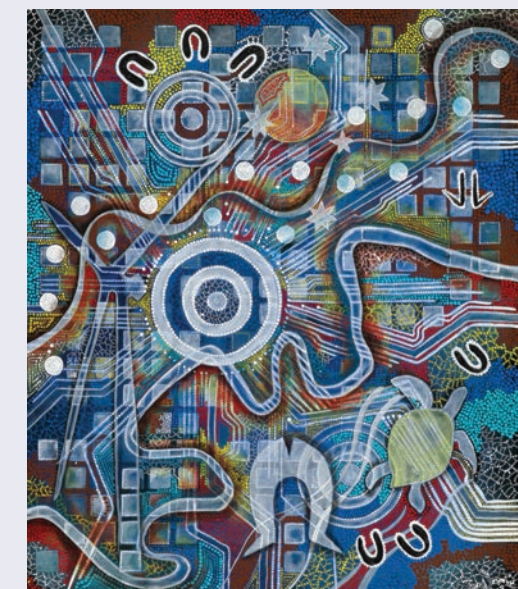
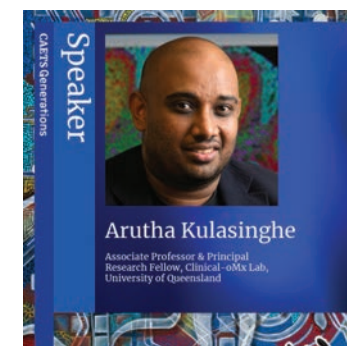
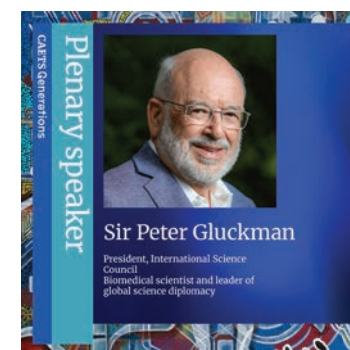
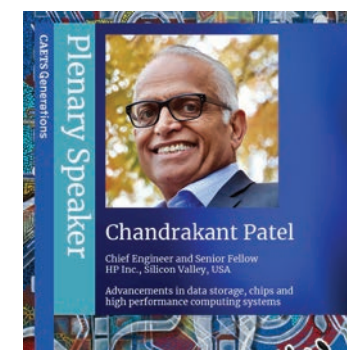
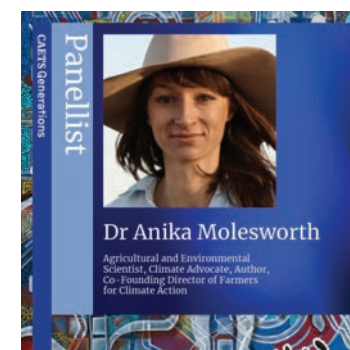
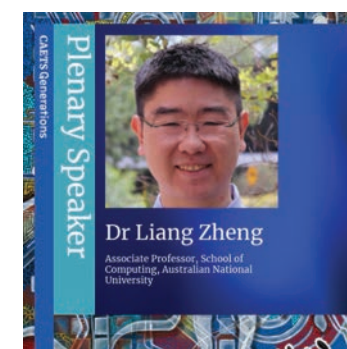
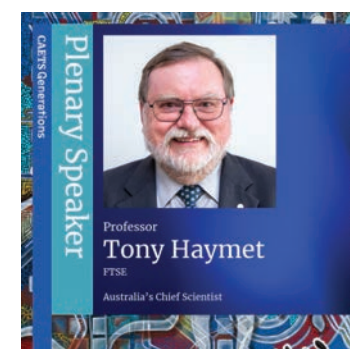
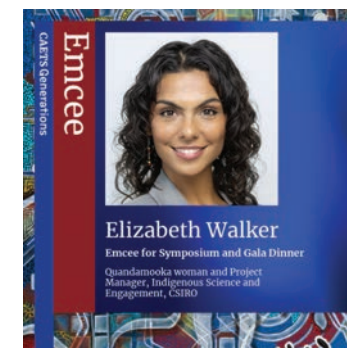
## SPONSORS



## PARTNER



GET YOUR TICKET TODAY  
[caets2025.org](https://caets2025.org)



Generations by Sid Domic, 2024

"This artwork has been created for the International STEM symposium shaping a sustainable future in 50 years. The Australian Academy of Technological Sciences & Engineering will gather their network of partners in Brisbane in 2025.

The theme of the gathering is called 'Generations' pointing out the importance of considering the past, in the present when creating for the future. As with each generation we evolve, technology is also evolving.

With this painting I like to acknowledge our Aboriginal ancestors and how they were connected with and understood country with intimate detail. As they cared for country, how they studied country and how they were a part of country. Their knowledges expanded to environmental sciences, engineering, marine biology, astronomy, health/healing, teaching/education.

Symbolised is the Brisbane river as the Academies' meeting place in Meeanjin, Brisbane.

The sand goanna prints signify the totem animal of the traditional custodians of the Brisbane area, and their connection to country is depicted by the kangaroo prints. The Dari, a traditional headdress of the Torres Strait islander people represents their culture and different tribes. The turtle stands for the great significance of the ocean to Aboriginal and Torres Strait Islander people.

The sun and the Southern Cross are acknowledging Sky country above with the links to songlines here on land and the seasonal knowledge and understanding of country. The three circles are past, present and future timelines with the U-shapes representing our Elders and knowledge holders. The feature of the windmill is a signpost of change in the landscape representing the switch from fossil fuels to renewable energies. The digital circuit background layer was inspired by the different connectors which all meet up in the central console.

It reminds me of all the participants attending the conference. Coming from all corners of the world, each and everyone with their own stories, knowledges and experiences, gathered in the one place, engaging collectively to create action for a better future. Because only by acknowledging the past in the present, can we build this better future."

Sid Domic, Kalkatungu man



# Generations

An international symposium shaping  
a sustainable future in 50 years

BRISBANE | AUSTRALIA | 8-11 SEPTEMBER 2025



UN SDGs  
13 – Climate action



## International science comes to Australia

THE GENERATIONS SYMPOSIUM will bring together representatives of the academies of engineering and technological sciences from around the world. In 2024, leading up to ATSE's hosting year, we took part in a number of bilateral discussions with partner academies.

Together with the Royal Academy of Engineering from the United Kingdom, we hosted the Frontiers Symposium in Perth, in October 2024, we hosted the Frontiers Symposium in Perth. This focused on applying science and technology in a global development context. The event saw peers from the UK, the Pacific, South-East Asia and regions around the world joining conversations on sustainable communities, innovation and climate adaptation.

ATSE Fellows and professional staff worked together to make this happen. The gathering created a space for researchers and practitioners to build lifelong professional connections that will benefit people well into the future.

Following *Frontiers*, ATSE organised visits from the Engineering Academy of Japan (EAJ) and the Danish Academy of Technical Sciences (ATV) for workshops on hydrogen and clean energy, and on carbon capture, utilisation and storage respectively. These inter-Academy meetings laid the foundations for future collaborations on research and on technology development.

With the EAJ, ATSE resumed the Australia-Japan Emerging Research Leaders Exchange Program which has been operating since 2008. Three early-career researchers from Japan completed one-week placements in Australian universities ahead of the forum, which involved ATSE and EAJ Fellows discussing clean energy. A parallel hydrogen policy report is being run through 2025 between the Academies, and this will be publicly released later in the year.

The ATV workshop supported a delegation of experts, companies and government officials from Denmark

focused on learning about the potential and possibilities of Carbon Capture Utilisation and Storage. A half-day roundtable hosted by ATSE Fellow Professor Sandra Kentish FTSE included representatives from the Australian Energy Producers association and opened new dialogue between international peers.

These three international Academy collaborations highlight the best of the global network of which ATSE is part, as a founding member of the International Council of Academies of Engineering and Technological Sciences. Responding to shared global challenges requires international dialogue and coordination. Both perils and opportunities cross borders, and so must the knowledge, the knowledge builders and the disseminators.

These three events have led us towards the theme of the CAETS Generations symposium and have created effective knowledge hubs through international collaboration. ▶



**CAETS<sup>2025</sup>**  
The annual conference of Academies of  
Engineering and Technological Sciences



# Making communities safer through water knowledge and collaboration.

For Dr Maryam Farzadkhoo, an ATSE Elevate Leadership Scholar and Senior Floodplain Scientist at the NSW Department of Climate Change, Energy, the Environment and Water, understanding fluid dynamics and flood risks is motivated by her drive to build local-global community resilience in the face of ongoing climate change and major weather events.



**Dr Maryam Farzadkhoo**  
Elevate Leadership Scholar

MARYAM'S STEM JOURNEY started early. Her parents instilling in her a determination to pursue engineering as a way to make meaningful impact has stayed with her throughout her life. Her own values of empathy and resilience, her care for communities, and her concern for climate impacts into her work, helping communities protect their livelihoods and infrastructure. Motivated by collaboration, she brings scientists and decision-makers together to develop real world solutions.

Dr Farzadkhoo cites the recent major flooding in the wake of ex-Tropical Cyclone Alfred to illustrate how working together is paramount to ensure local communities have access to timely and relevant data – information that can be life altering in a weather crisis. Her work is contributing to improving early flood warning systems empowering local authorities to take emergency responses at the right time.

"The most important thing in

science and engineering is to have a strong, supportive network that fosters collaboration, innovation and inclusivity. In my work as a floodplain scientist, I engage with a diverse range of experts from engineers, hydrologists and policy makers to local communities. Solving these complex challenges wouldn't happen without these collaborations."

From studying water quality in river communities to learning about fish migration and the overlap of engineering and biodiversity, Maryam is currently applying her knowledge of water flows to design flood prevention strategies. Floods are some of the most damaging natural hazards – now more than ever with climate change making extreme weather events a norm.

Maryam is also focused on opening doors for others around her.

She says that, "by fostering a culture of inclusion, we are ensuring that science is benefiting and that

diversity is actually strengthening the quality of solutions."

She is one of the very few women in water engineering, which drives her to create support networks and mentoring for others coming after her. She founded the Women of Water, affectionately known as WOW, within her NSW Government department.

"I saw a need to build a network."

The **Elevate: Boosting diversity in STEM Leadership Scholarship** Maryam received from ATSE "was a turning point in my life."

It ignited her sense of purpose and allowed her to build her skills as a leader – not just as an engineer but as an advocate for change. The scholarship has allowed Maryam to pursue an MBA at the intersection of science, engineering and innovation.

Science policy is central to her career aspirations. She has received mentoring from the Chief Scientist

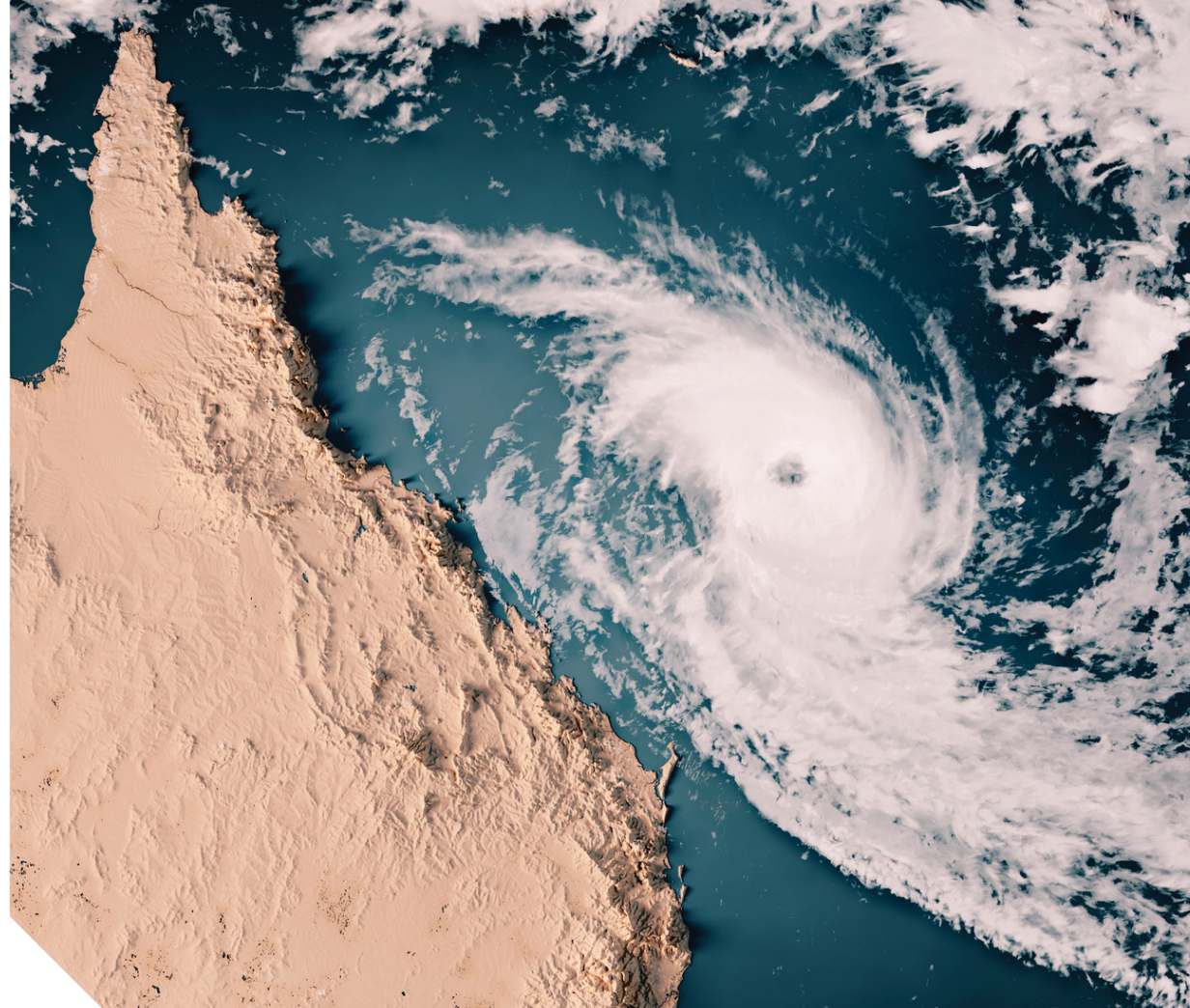
as Maryam becomes a more familiar face throughout the STEM ecosystem.

The power of the connections made through ATSE speak volumes on the impact and intention of the Elevate program..

Elevate is creating a robust network of STEM professionals capable of responding to the challenges we face with innovation, creativity and resources. It will create better social outcomes, environmental outcomes and community resilience.

Maryam is clear – knowledge sharing leads to more robust outcomes.

As she says, "It is crucial to uplift and empower one another – engineers and scientists from across the ecosystem. Excellence meets real world impacts when diverse voices are shaping the future of science policy and driving solutions to global challenges." ▲



Left: 3D render of a topographic map of the Coral Sea with the clouds from 28 February 2025, showing category 4 severe Tropical Cyclone Alfred east of Australia. Source: iStock



UN SDGs  
5 – Gender equality  
6 – Clean water and sanitation  
11 – Sustainable cities and communities

## ELEVATE

Boosting diversity  
in STEM

© MORE ABOUT ELEVATE

**Elevate: Boosting diversity in STEM**



# We are the changemakers

Extract from an address by Dr Marlene Kanga  
AO FTSE FREng on the occasion of the University  
of New South Wales Graduation Ceremony and  
Conferral of her Doctor of Engineering Honoris  
Causa on 24 March 2025.



**Dr Marlene Kanga**  
AO FTSE FREng  
Dr Kanga is a recognised leader of STEM organisations. She was the 2013 National President and Board Chair of Engineers Australia and the 2017-2019 President and Board Chair of the World Federation of Engineering Organizations, a UNESCO affiliate, representing 100+ nations and more than 30 million engineers. From 2011-2017, she was a vice-president of the International Network for Women Engineers and Scientists.

Her significant international achievements include successfully founding World Engineering Day for Sustainable Development on 4th March, with unanimous approval for the proposal by the UNESCO member states and initiating and leading the review of international engineering education benchmarks to reflect contemporary values and approaches including diversity and inclusion. She continues to lead advocacy for more women in STEM at UN Women and the Commission on the Status of Women.

▲ Elected 2014



I AM UNASHAMEDLY biased in my view, as a chemical engineer who is passionate about engineering and enjoys it very much. When I first went to study chemical engineering, I went for one reason: I enjoyed mathematics and chemistry. I had little understanding of the role of engineers and the impact that engineering can have on the world. Over the years I have realised that engineers have the force – we are the change makers who not only have the vision but also the ability and the skills to make these a reality – to change the world, for better or worse.

Engineers have been innovating and changing the world for centuries. The early civil engineers built the first urban settlement in the Indus valley at Mohenjo-Daro around 2600 BC, with rectangular street grids, grand buildings and public baths. The Roman engineers developed many of the cities of Europe from Rome to London.

The Industrial Revolution in the 19th century in Europe was driven by inventions like the steam engine which reshaped the world. Steam engines led to rail networks and industrialisation, jet engines led to global travel, and the first computers eventually enabled global connections and access to vast amounts of information.

All this has been made possible with science, technology and engineering. The creativity of engineers changed the world, affecting the quality of life of everyone in most parts of the globe.



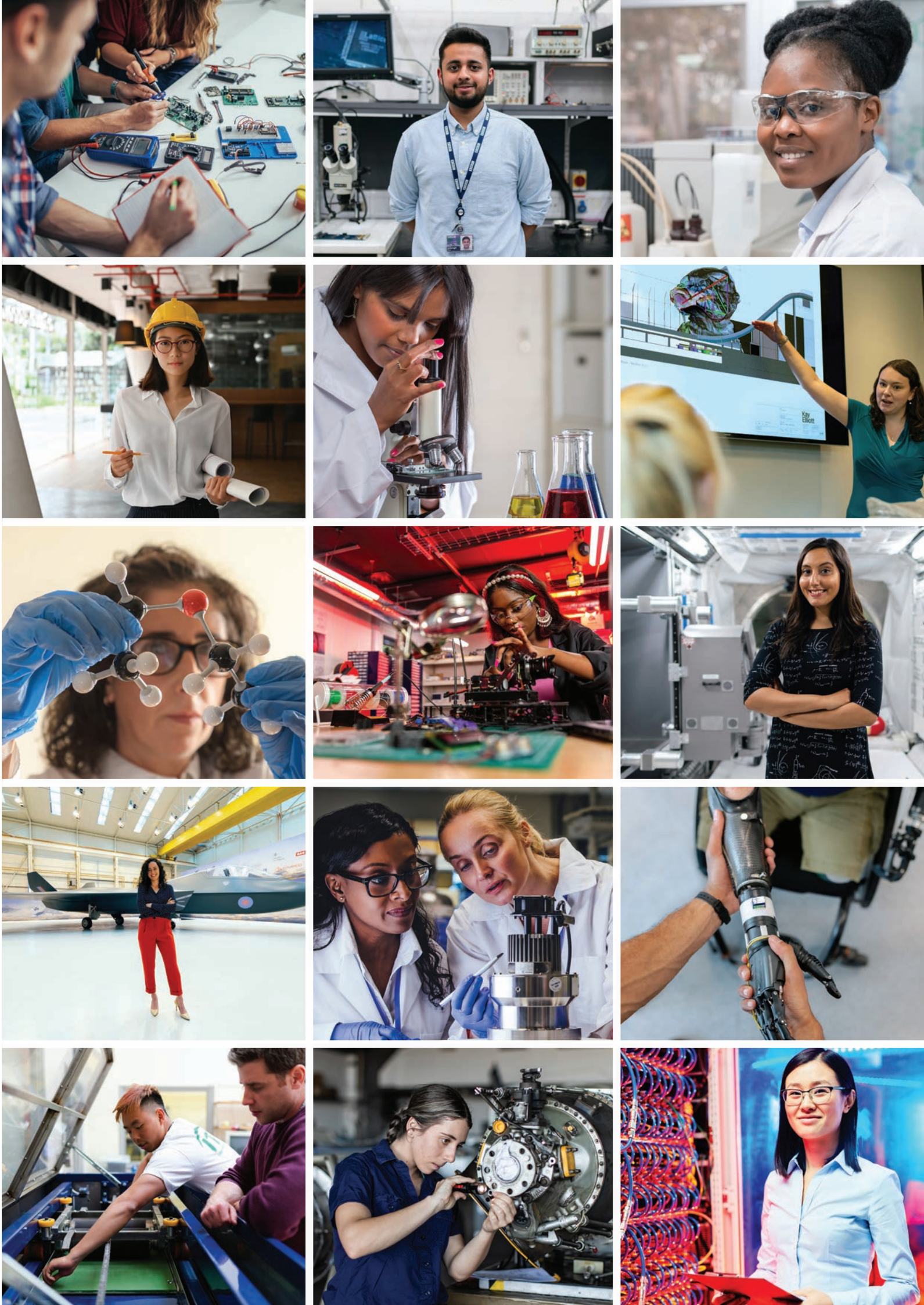
UN SDGs  
9 – Industry, innovation and infrastructure

Engineers are transforming our world at an unprecedented pace. You have probably seen the changes in your time at university and the changes will continue to accelerate. This means of course that you will never be short of interesting and challenging work. So travel lightly – you can take your skills with you and see the world.

However, it's not only important to do great technical work. We engineers also have to communicate more, so that the community can understand that engineers are key to addressing so many of the challenges that the world faces. I have done a little bit about this by successfully leading the proposal, as President of the World Federation of Engineering Organisations from 2017 to 2019 for UNESCO to declare 4 March as World Engineering Day for Sustainable Development. Now celebrated by millions around the world. My message has been, "If you want to change the world, become an engineer".

So here you are with the necessary skills and abilities to make a difference – beyond what you think you are capable of. My advice to you all as you graduate today is to realise your power and have a long-term vision of your goals. Engineering is endlessly challenging, always requiring you to think differently and to innovate. I hope that every one of you has a lot of fun and enjoys the challenges that you encounter. Most importantly, I hope that you will all strive to make a difference for a better, peaceful and sustainable world. ▲

Image sources: iStock; Unsplash (ThisIsEngineering) [thisisengineering.org.uk](https://thisisengineering.org.uk) is a multi-year campaign led by the Royal Academy of Engineering in partnership with Engineering UK and major engineering organisations. The aim is to show more young people what engineering really looks like, and how it could be a exciting and rewarding path in the future. Part of the project is to create a free library of photographs of real engineers.







## New Fellows 2024

ABOVE Standing left > right: Dr Chris Booth (representing Dr Iris Depaz (Dec)), Professor Chuan Zhao, Professor Frank Caruso, Adjunct Professor Craig Rayner, Professor Alex Brown, Scientia Professor Toby Walsh, Dr James Tickner, Rachelle Doyle, Professor Xiwang Zhang, Karen Dobson, Dr Zongli Xie, Professor Yixia (Sarah) Zhang, Dr Josep (Pep) Canadell, Professor Yan Zhuge FTSE, Professor Lianzhou Wang, Distinguished Professor Michelle Leishman.

Seated left > right: Scientia Professor Liming Dai, Distinguished Professor David Moss, Guy Templeton, Professor Paul Simshauser, Anne O'Neill, Kylie Walker (ATSE CEO), Dr Katherine Woodthorpe (ATSE President), Fiona Simson, Professor Mark Hoffman (Vice-President, ATSE Membership Committee), Anne-Marie Birkill, Professor Clinton Fookes, Dr Angeline Achariya

Absent from photo: Rear Admiral Rachel Durbin, Dr Michelle Heupel, Gabrielle Iwanow, Professor Misty Jenkins, Dr Fiona Kerr, Professor Karin Verspoor, Professor Sally Benson, Dr Iris Depaz (Dec)

Shot in Melbourne on Thursday 17 October 2024.  
Credit: Salty Dingo

**A trailblazing Indigenous genomics expert, a carbon emissions modeller, a naval defence engineer, a world farming authority, a shark tracker, a brain cancer therapist and a global artificial intelligence leader are among 32 innovators elected as Fellows of the Australian Academy of Technological Sciences & Engineering.**

ATSE'S 2024 NEW Fellows showcase the breadth and depth of world-class Australian innovation with game-changing contributions spanning food sustainability, chronic diseases, water security, health technologies, critical minerals, artificial intelligence, clean energy technologies, sustainable infrastructure and more.

ATSE President Dr Katherine Woodthorpe AO FTSE said the 2024 new Fellows are the thinkers and doers at the forefront of Australian discoveries, technological breakthroughs and future industries.

"Our Fellows are bridging from discovery to shaping new industries in the ultimate service of better living for all Australians and the world," said Dr Woodthorpe.

A farmer from the Liverpool Plains of NSW, Fiona Simson FTSE has dedicated her career to supporting the sustainability and growth of rural and regional communities. The first woman president of the National Farmers' Federation, now

Vice-President of the World Farmers Organisation, Fiona is a pioneer at the nexus of climate change, biodiversity and the future of food.

A pioneer in using acoustic tracking to study shark movement ecology, the work of Dr Michelle Heupel FTSE has directly led to stronger protections for marine predators, informed fisheries sustainability, and guided decisions establishing marine protected areas.

Trailblazing medical doctor and Yuin man Professor Alex Brown FTSE FAHMS has helped tackle chronic disease in vulnerable communities. By identifying and overcoming health disparities, his work focuses on empowering and growing the next generation of Aboriginal and Torres Strait Islander researchers.

Mining leader Gabrielle Iwanow FTSE has fused technical excellence and strategic vision to champion the use of novel

technologies to make mining safer, more sustainable and more efficient. She is an advocate for a more diverse mining sector in Australia and leads efforts to support and promote underrepresented groups including women and Indigenous people.

Artificial intelligence is one of the megatrends of this moment. It is disrupting how we work, live and play at a fundamental level. Author, renowned commentator and globally recognised AI developer Professor Toby Walsh FTSE FAA has been elected for his contributions to computer science and advocacy for guardrails to ensure AI is used to improve our lives.

Elected by their peers, the cohort joins over 900 of Australia's leading engineers and applied scientists who have been elected to the Academy for their outstanding contributions across Australia's innovation ecosystem. ▲





**Dr Angeline Achariya**  
FTSE  
Food innovation leader

A pathfinding leader in the agrifood sector, Dr Achariya is enhancing Australia's reputation as a leading value-added agriculture producer and food manufacturer through her work.



**Anne-Marie Birkill**  
FTSE  
Technology and healthcare investor

Anne-Marie Birkill has an outstanding track record for impact spanning three decades in research commercialisation and venture capital investment.



**Professor Alex Brown**  
FTSE FAHMS  
Acclaimed medical expert

Professor Brown is a trailblazing Indigenous medical doctor and genomics researcher. He is Professor of Indigenous genomics and Director of the National Centre of Indigenous Genomics at the Australian National University and The Kids Research Institute Australia.



**Rear Admiral Rachel Durbin**  
CSC RAN FTSE  
Maritime engineering leader

Rear Admiral Durbin has served in the Royal Australian Navy for more than 30 years, and currently holds the position of Head Navy Engineering and Defence Seaworthiness Regulator.



**Professor Clinton Fookes**  
FTSE  
Artificial intelligence innovator

Professor Fookes has made significant advancements to Australia's capabilities across computer vision, machine learning, signal processing and artificial intelligence technologies.



**Dr Michelle Heupel**  
FTSE  
Pioneering ocean ecologist

Dr Heupel revolutionised remote acoustic tracking of aquatic species to understand animal movement. She has successfully translated this research into powerful conservation action and policies at national and global scales.



**Dr Josep (Pep) Canadell**  
FTSE  
World-leading climate scientist

Dr Canadell is an eminent world authority on biogeochemistry, particularly the human impact on the Earth's carbon cycle and ecological processes. He developed integrative methodologies for estimating global carbon sources and sinks, which have become the world standard.



**Professor Frank Caruso**  
FRS FTSE FAA  
Pioneering particle engineer

Professor Caruso is internationally renowned for developing versatile and ingenious nanoengineering methods that have been adopted by researchers and industry worldwide.



**Scientia Professor Liming Dai**  
FTSE FAA  
Materials science maestro

Professor Dai is a world leader in carbon nanomaterials research and development. He holds 18 international patents with a remarkable commercialisation track record.



**Gabrielle Iwanow**  
FTSE  
Mineral resources changemaker

Gabrielle Iwanow is an outstanding leader in the mining sector, possessing a combination of technical excellence, strategic vision and ability to translate mission into impact.



**Professor Misty Jenkins**  
AO FTSE  
Outstanding cancer immunologist

Professor Jenkins is a leading immunologist who has made exceptional contributions to T cell immunology. Her research, focused on developing CAR T-cell therapeutics for brain cancer, seamlessly straddles fundamental discovery research with clinical application.



**Dr Fiona Kerr**  
FTSE  
Pathbreaking human-centred technologist

Dr Kerr is at the forefront of shaping a future that is technology powered and human centred. As founder of The Neurotech Institute, she combines expertise across cognitive neuroscience, anthropology, psychology, and complex system dynamics.



**Dr Iris Depaz**  
FTSE  
Life sciences champion

Dr Depaz profoundly changed the model for the translation and commercialisation of medical research into the clinic in Australia, establishing a first-of-its-kind, global scientific community focused on mRNA technology and translational science.



**Karen Dobson**  
FTSE  
Change management leader

Karen Dobson is a leading advocate for advanced manufacturing in Australia. Throughout her career at Dow and her many advisory roles, she has influenced industry, government and university researchers to address issues of water scarcity, climate change and the circular economy.



**Rachelle Doyle**  
FTSE  
Energy transition advocate

Rachelle Doyle is a passionate leader and advocate for the energy transition with extensive experience in the energy and minerals processing sectors.



**Distinguished Professor Michelle Leishman**  
FTSE  
Preeminent plant ecologist

Distinguished Professor Leishman has transformed our understanding of how native plants, crops and weeds will respond to climate change.



**Distinguished Professor David Moss**  
FTSE  
World-leading photonics researcher

Distinguished Professor Moss has made seminal contributions to photonics and optics, particularly his work with microcombs – devices that can link the electronic and optical frequency regimes.



**Anne O'Neill**  
FTSE  
Health innovation changemaker

Anne O'Neill has transformed NSW's health and medical research sector into a billion-dollar innovation engine for Australia and an international investment hub.



**Adjunct Professor Craig Rayner**  
AM FTSE FAHMS  
Pharmaceutical development expert

Adjunct Professor Rayner is a clinical pharmacologist and leading authority in model-informed drug development.



**Professor Paul Simshauser**  
AM FTSE  
Exceptional energy economist

Professor Simshauser is a leading energy economist, with a remarkable record of achievement across government, academia and industry.



**Guy Templeton**  
FTSE FAICD  
Impactful infrastructure engineer

Guy Templeton is a distinguished Australian engineer and business leader.



**Professor Yixia (Sarah) Zhang**  
FTSE  
Advanced materials creator

Renowned for research in the infrastructure and composites industry, Professor Zhang has led more than 50 projects focused on advanced materials and composite structures.



**Professor Chuan Zhao**  
FTSE  
Hydrogen paradigm shifter

Professor Zhao is supercharging Australia's green hydrogen capabilities with breakthrough water splitting electrode technology.



**Professor Yan Zhuge** FTSE  
Waste conversion trailblazer

Professor Zhuge is a structural engineer with an impressive track record developing innovative green materials.



**Dr James Tickner**  
FTSE  
Scientist, innovator and entrepreneur

Dr Tickner has achieved global impact through his research, inventions and leadership. He oversaw the successful commercialisation of the PhotonAssay technology that he initially developed whilst working at CSIRO.



**Professor Karin Verspoor**  
FTSE  
AI in Healthcare leader

Professor Verspoor is a leading expert on artificial intelligence, applying language technologies to health and biomedical data.



**Scientia Professor Toby Walsh**  
FTSE FAA  
Artificial intelligence pioneer

Professor Walsh has made important contributions to computer science and the foundations of artificial intelligence.



**HONORARY FELLOW**  
**Fiona Simson**  
FTSE  
Global agriculture advocate

Fiona Simson is a prominent champion for rural and regional issues in Australia and on the world stage.



**FOREIGN FELLOW**  
**Professor Sally Benson**  
FTSE  
Climate policy powerhouse

Professor Benson is a world-leading expert in clean energy, particularly in carbon capture and storage.



**Professor Lianzhou Wang**  
FTSE FAA  
Semiconductor materials innovator

Professor Wang is widely recognised for developing novel nanomaterials for clean energy technologies.



**Dr Zongli Xie**  
FTSE  
Membrane & catalysis groundbreaker

Dr Xie's groundbreaking membrane and catalysis technologies have generated tangible benefits for both industry and the environment.



**Professor Xiwang Zhang**  
FTSE  
Sustainable technology innovator

Professor Zhang is internationally recognised for his innovative work on membrane science and technology, tackling complex challenges in the crucial nexus of water, environment and climate change.

## SAVE THE DATES

**Wednesday 29 October**  
Evening

Welcome reception for ATSE's 2025 New Fellows

**Thursday 30 October**  
Daytime

ATSE New Fellows Showcase 2025

**Thursday 30 October**  
Evening

ATSE Awards 2025

National Wine Centre Adelaide

[atse.org.au/events](https://atse.org.au/events)



NEW  
FELLOWS

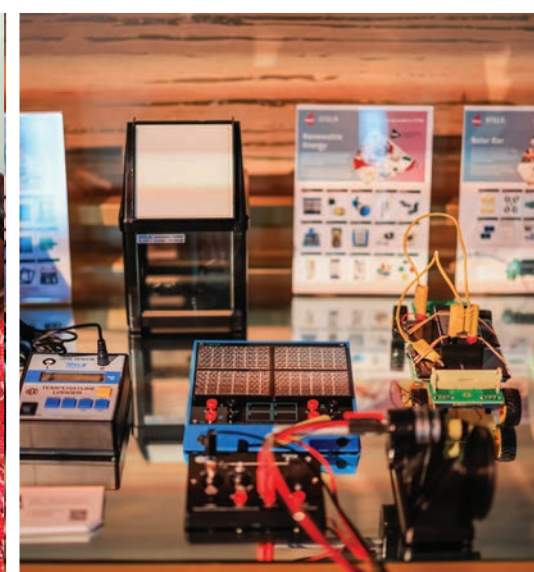


ATSE New Fellows 2024



The 2024  
New Fellows  
welcome  
reception  
was held at  
Melbourne's  
Southbank  
on Thursday  
17 October.







**ATSE  
AWARDS  
2025**

CLUNIES ROSS TECHNOLOGY  
INNOVATION AWARDS

BATTERHAM MEDAL FOR  
ENGINEERING EXCELLENCE

DAVID & VALERIE  
SOLOMON AWARD

EZIO RIZZARDO POLYMER  
SCHOLARSHIP

TRADITIONAL KNOWLEDGE  
INNOVATION AWARD

# Prepare your nominations

The nationally prestigious ATSE Awards recognise Australian excellence across a range of STEM disciplines.

## WHO WILL YOU NOMINATE?

We encourage you to consider the emerging leaders or experienced innovators in your sector who you could nominate. If you would like to discuss your nomination or the process of preparing a nomination, please contact ATSE Membership Manager Elvira Copur: [membership@atse.org.au](mailto:membership@atse.org.au)

**Nominations close 13 May 2025**

[atse.org.au/awards](https://atse.org.au/awards)

## SAVE THE DATE

ATSE Awards Gala Dinner  
30 October 2025  
National Wine Centre, Adelaide



## ATSE Awards winners 2024

Left to right

**Professor Andrew Blakers FTSE FAA**  
Winner of the Clunies Ross Technology  
Innovation Award

**Fiona Walsh and Kanyirninpa Jukurrpa  
(Carol Williams and Emilesia Williams  
representing Kanyirninpa Jukurrpa)**  
Joint winners of the Traditional  
Knowledge Innovation Award

**Brendan Hung**  
Winner of the Ezio Rizzardo  
Polymer Scholarship

**Professor Lyn Beazley AO FTSE FAA**  
Winner of the ATSE President's Medal

**Professor Sara Couperthwaite**  
Winner of the David and Valerie  
Solomon Award

**Dr Vivien Rolland**  
Winner of the ICM Agrifood Award  
for Excellence in Agrifood

**Dr Kristy DiGiacomo**  
Winner of the ICM Agrifood Award  
for Excellence in Agrifood

**Dr Scott Menegon**  
Winner of the Batterham Medal  
for Engineering Excellence



# Celebrating Australian technology and engineering trailblazers at the ATSE Awards 2024

A SCIENTIST MAKING Aussie guts healthier, a solar cell inventor at the centre of a global solar boom and a collaboration between the Eastern Pilbara Martu people which explains an environmental phenomenon that western science couldn't, were among the winners celebrated at the Australian Academy of Technological Sciences & Engineering's annual national ATSE Awards.

The awardees were recognised for making major breakthroughs that are changing the way Australians work, live and play, during a ceremony at the 2024 ATSE Awards Gala Dinner at Metropolis Melbourne.

Professor Andrew Blakers FTSE FAA was named the winner of the prestigious Clunies Ross Technology Innovation Award for his contributions to the renewable energy transition. Andrew helped develop the PERC (Passivated Emitter and Rear Contact) solar cells which make up half of all solar cells worldwide and are mitigating an estimated 2% of global greenhouse emissions. He also created a global atlas of about one million possible sites for off-river pumped hydro energy storage with the potential to power about one trillion electric vehicle batteries.

Linyji or 'fairy circles' are patches of bare earth that polka-dot Australia's arid grasslands in desert country. A collaboration between the Eastern Pilbara Martu people through Indigenous organisation Kanyirninpa Jukurrpa and ethnoecologist Dr Fiona

Walsh has taken home the Traditional Knowledge Innovation Award for upending the notion that Australia lacks climate data for our desert regions. The groundbreaking project reveals linyji's foundational role as homes for termites and important water spots for people and desert ecosystems, as well as centres of art, culture and gathering. The project has been hailed for the way it respectfully weaves together Traditional Knowledge with western science, uplifting Aboriginal voices, expertise and communities.

Professor Sara Couperthwaite has won the David & Valerie Solomon Award for her research transforming mining waste into high purity alumina for safer lithium-ion batteries. By commercialising a pathway to reuse and transform the mining waste filling tailings dams across Australia, she is helping open up new export markets and develop new sources of sustainable critical minerals.

ICM Agrifood Award winners Dr Kristy DiGiacomo and Dr Vivien Rolland are making Australian food more nutritious and sustainable. Kristy is changing the kid rearing and feeding regimes of Australia's largest goat dairies and is demonstrating how a diet of insects can benefit animal growth, health and meat quality. Vivien is creating state-of-the-art artificial intelligence and imaging tools to enhance the productivity and sustainability of key food, oil and fibre crops, tools already being used by commercial breeders and researchers.

Dr Scott Menegon, a structural engineer who is earthquake-proofing Australian infrastructure and informing our building standards, has won the Batterham Medal for Engineering Excellence. Scott is improving the design of multi-storey buildings across Australia – from hospitals to 60-storey apartment blocks.

Professor Lyn Beazley AO FTSE FAA, a neuroscience researcher who went on to become Chief Scientist of Western Australia, has taken home ATSE's President's Medal for her contributions to the Academy, championing of applied sciences and her focus on getting young people into STEM.

ATSE President, Dr Katherine Woodthorpe AO FTSE, said the winners are emblematic of how applied science and technology are making Australian lives better.

These 2024 ATSE Award winners are proof that innovation in Australia is alive and well. They are showcasing the innovations that will catalyse Australia's future industries and unlock prosperity, safety and sustainability for all Australians.

"Spanning inventions and discoveries in renewable technologies, health, infrastructure, food and biodiversity, the awardees showcase the value of Australian ingenuity. This must be cherished, nurtured and grown so that Australia continues to inspire future generations of STEM leaders," said Dr Woodthorpe. ▶

**Nominations for the ATSE Awards 2025 close 13 May 2025**

ATSE  
AWARDS



## CLUNIES ROSS TECHNOLOGY INNOVATION AWARD

**Professor Andrew Blakers FTSE FAA**  
Solar power pioneer

Professor Andrew Blakers has made transformational contributions to the renewable energy transition. Andrew was instrumental in designing and creating silicon solar cells in the 1980s. Alongside colleagues, Andrew went on to develop the PERC (Passivated Emitter and Rear Contact) solar cells that are at the heart of the worldwide solar industry and are currently mitigating an estimated 2% of global greenhouse emissions through displacement of coal generation. Andrew and his co-inventors won the 2023 Queen Elizabeth Prize for Engineering for developing this technology.

He has also led the creation of a comprehensive global atlas of about one million potential sites for off-river pumped hydro energy storage with combined storage potential equivalent to about one trillion electric vehicle batteries. A Professor of Engineering at the Australian National University, Andrew's record of entrepreneurship, innovation and outreach is exemplary. Andrew is one of Australia's top renewable energy researchers known by millions.



WATCH THE VIDEO

**Professor Andrew Blakers – Clunies Ross Technology Innovation Award 2024**



## ENGINEERING EXCELLENCE

**Dr Scott Menegon**  
Earthquake safety specialist

A structural engineer and senior lecturer at Swinburne University, Dr Scott Menegon is improving the design of multi-storey buildings across Australia – from hospitals to 60-storey apartment blocks.

With expertise in earthquake engineering, Scott's research into both reinforced and precast concrete is helping to better prepare Australia for earthquakes – which are low-probability but high-consequence events. His research has informed Australian building standards, and he has undertaken several large-scale seismic testing programs. He is currently developing next-generation precast concrete cores as part of an innovative industry collaboration. Scott is enthusiastic about translating his research to real-world impact through education and industry guidance. He has delivered seminars and short courses to more than 2,000 practising engineers over the last five years, is the current president of the Australian Earthquake Engineering Society and has been awarded Engineers Australia's RW Chapman Medal twice (in 2019 and 2022).



WATCH THE VIDEO

**Dr Scott Menegon – Batterham Medal for Engineering Excellence 2024**



ATSE  
AWARDS

## DAVID &amp; VALERIE SOLOMON AWARD

**Professor Sara Couperthwaite**  
Critical minerals maverick

Professor Sara Couperthwaite is an industrial chemist at Queensland University of Technology. Her research aims to transform the sustainability of mineral processing and secure critical minerals to power the renewable energy transition.

Sara leads a research team that achieved a breakthrough in the production of high purity alumina (HPA), a material that improves the performance and safety of lithium-ion batteries. In a cutting-edge partnership with Lava Blue, she is developing and commercialising a pathway to transform mining waste, which currently fills tailings dams across Australia, into HPA for export markets. This innovative collaboration was awarded a 2023 Australian Financial Review Higher Education Award (Industry Engagement). Sara has also received an ARC Mid-Career Industry Fellowship to focus on developing sustainable critical mineral supplies using technology not dependent on fossil fuels. Sara is passionate about fostering a future sustainability-oriented workforce, through industry-immersive pathways for science and engineering students, and through training at the Lava Blue 'mini-plant' to increase Australia's capacity in critical minerals.



## WATCH THE VIDEO

**Professor Sara Couperthwaite – David & Valerie Solomon Award 2024**



## ICM AGRIFOOD AWARD

**Dr Kristy DiGiacomo**  
Sustainable food innovator

Dr Kristy DiGiacomo is generating real-world impact in Australian animal production, improving both productivity and sustainability. Her investigation into lactating dairy goats led to Australia's largest goat dairy changing their kid rearing and feeding regimes.

Kristy is also advancing our understanding of how to use insects as a sustainable food source for livestock animals. In this research, food waste is used to grow black soldier fly larvae, which are then harvested and processed to make an insect-based product rich in protein and fat. Kristy is assessing how incorporating this insect protein into an animal's diet affects growth, health and meat quality.

Based at the University of Melbourne, Kristy is a senior lecturer in production animal nutrition and physiology and is a Veski sustainable agriculture fellow. She has cultivated strong research partnerships with industry and supervises numerous research students. Kristy is passionate about women's leadership in science and is the current federal treasurer of the Australian Association of Ruminant Nutrition.



## WATCH THE VIDEO

**Dr Kristy DiGiacomo – ICM Agrifood Award for Engineering Excellence 2024**



## ICM AGRIFOOD AWARD

**Dr Vivien Rolland**  
Agriculture technology developer

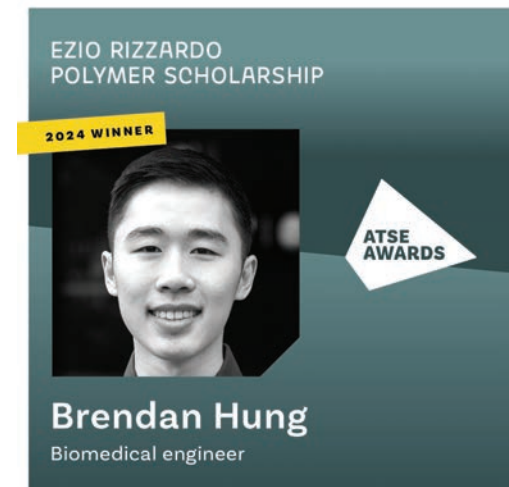
Dr Vivien Rolland develops state-of-the-art artificial intelligence (AI) and imaging tools to enhance the productivity and sustainability of key food, oil and fibre crops. Two of his AI imaging inventions support selection of cotton crops based on leaf hairiness, enabling a world-first ability to better breed for fibre yield and insect resistance. He has also developed a more accurate tool for monitoring wheat growth and is extending these approaches to food quality and safety.

A senior research scientist at CSIRO and leader of the Crops Digital Twin team, Vivien has an outstanding ability to transform ideas into tangible outcomes. His AI tools are being rolled out in a commercial breeding program, with further expansion of the technology to other valuable crop traits being funded by industry. Vivien won the ACT Young Tall Poppy Scientist of the Year award in 2022, and in 2023 was awarded a Nuffield Fellowship. His outreach efforts engage both the public and decision-makers with science, and he has been invited to participate in the FAO World Food Forum and the UN Committee on World Food Security as an expert on agrifood innovation.



## WATCH THE VIDEO

**Dr Vivien Rolland – ICM Agrifood Award for Excellence in Agrifood 2024**



## EZIO RIZZARDO POLYMER SCHOLARSHIP

**Brendan Hung**  
Biomedical engineer

Brendan Hung is a rising star in polymer science whose research spans biomedical science and engineering. As a first-year PhD candidate at Monash University, Brendan aims to develop a new way to study digestive system disorders by capturing intricate human biology in a dish. Disorders of the intestine – like inflammatory bowel disease and colorectal cancer – are complex, and tricky to mimic in animal models or in a test tube. Brendan plans to engineer innovative hydrogels and combine them with microfabrication techniques to create a more accurate and reproducible model of human intestinal tissue. The model can then be used to study gastrointestinal diseases in closer detail and find new therapies to treat them.

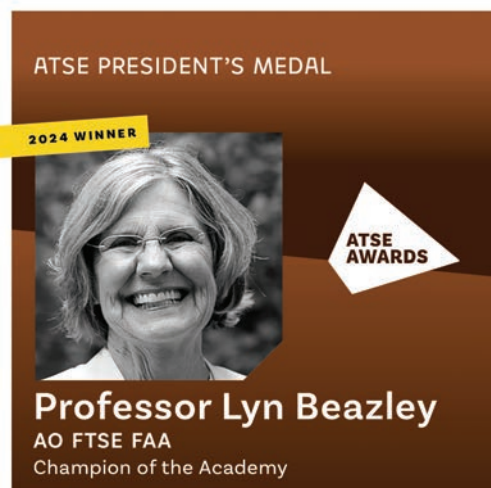
Brendan earned his Bachelor of Biomedical Science and Bachelor of Engineering (with First Class Honours) from Monash University in 2023, achieving an excellent academic record including numerous Dean's List commendations. He is a superb scientific communicator, leading outreach to high school students and the public through the Monash Forge student team.



## WATCH THE VIDEO

**Brendan Hung – Ezio Rizzardo Polymer Scholarship 2024**





## PRESIDENT'S MEDAL

### Professor Lyn Beazley AO FTSE FAA

A neuroscience researcher who went on to become Chief Scientist of Western Australia, Professor Lyn Beazley has been deeply involved in Australian science, innovation and technology for many decades. She played an important role in the development of ATSE's modern governance processes, and has been an active champion of the IMNIS program since its inception as an idea out of WA. Her promotion of STEM within political, scientific, educational and lay communities has helped drive the uptake of new technologies and innovations across society.

She was elected in 2009 and has been involved in the Education, Water and Energy Forums in her time as a Fellow. She spent many years as a member of the Membership Committee, the International Steering Group and the Clunies Ross Awards Committee, and continues to advocate for science and equity with a special focus on getting young people into STEM.

Above right: Professor Lyn Beazley and Dr Katherine Woodthorpe AO FTSE FAICD



#### WATCH THE VIDEO

[Professor Lyn Beazley – ATSE President's Medal 2024](#)



## TRADITIONAL KNOWLEDGE INNOVATION AWARD

### Kanyirninpa Jukurrpa & Dr Fiona Walsh

'Fairy circles' are patches of bare earth that polka-dot Australia's arid grasslands in desert country. They were thought to be the result of competition between spinifex plants, according to research based on similar landscape features in Namibia. A deep collaboration between the Martu people of the Eastern Pilbara through local Indigenous organisation Kanyirninpa Jukurrpa and non-Indigenous scientists upended this interpretation. The collaboration also disproved the notion that Australia lacks climate and ecosystem data for our desert regions and demonstrated that Indigenous Knowledge can lead Australian and international environmental research. The Martu people call these fairy circles 'linyji'. They know linyji to be the home of spinifex termites called 'Wartunynuma'. Linyji have long been used by desert people as temporary water sources, places for seed processing and resin making, and other domestic tasks.

Guided by Kanyirninpa Jukurrpa and ethnoecologist Dr Fiona Walsh, this groundbreaking project wove together Traditional Knowledge with environmental surveying and engineering methods. As a result, shared understanding of the linyji termite pavements has revealed their foundational role in desert art, cultures and ecosystems. The interdisciplinary and cross-cultural project has been hailed as a study that shows how to respectfully weave together Traditional Knowledge with western science, uplifting Aboriginal voices, expertise and communities.

Above right: Dr Fiona Walsh, Emilesia Williams and Carol Williams



#### WATCH THE VIDEO

[Kanyirninpa Jukurrpa and Fiona Walsh – Traditional Knowledge Innovation Award 2024](#)



Over 300  
leaders in  
Australian  
STEM attended  
the 2024 ATSE  
Awards on  
Thursday  
17 October in  
Melbourne.







Celebrate excellence in  
Australian STEM at the  
ATSE Awards 2025.

**ATSE  
AWARDS**

**REGISTER**  
[atse.org.au/events](https://atse.org.au/events)

ATSE Awards 2025  
Gala Dinner  
Thursday 30 October  
National Wine Centre  
Adelaide

**ATSE**

**50  
YEARS**

Australian Academy of  
Technological Sciences  
& Engineering  
1975-2025



# Stories of international discovery

Established to grow international collaboration, enhance Australia's standing as a science and technology leader, and drive innovation and commercialisation in priority areas, the Global Science & Technology Diplomacy Fund is a grant scheme supporting discovery around the world.

Delivered by ATSE in partnership with the Australian Academy of Science, and funded by the Department of Industry, Science and Resources, these grants are opening up a world of science and technology enterprise for Australian researchers and innovators.



Australian Government  
Department of Industry,  
Science and Resources



Australian Academy of  
Technological Sciences  
& Engineering  
1975-2025



The Global Science & Technology Diplomacy Fund is administered on behalf of DISR by ATSE in partnership with the Academy of Science.

## Global Science & Technology Diplomacy Fund recipients 2024



### Advancing sunlight-to-hydrogen conversion for a sustainable future

**Professor Rose Amal FTSE**  
UNSW Sydney

Partner countries: Japan, Indonesia, Malaysia and Singapore

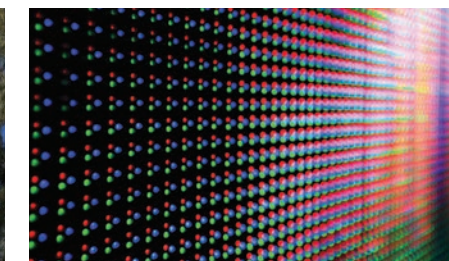


### Building a sustainable future toward net Zero:

A whole-life-cycle approach to digital manufacturing of carbon-neutral modular panels for affordable housing

**Professor Tuan Ngo**  
The University of Melbourne

Partner countries: Japan, Malaysia, New Zealand, Thailand and Vietnam



### Global hub of advanced materials and integrated optoelectronics (GH-AMIO)

**Associate Professor Ebinazar Namdas**  
The University of Queensland

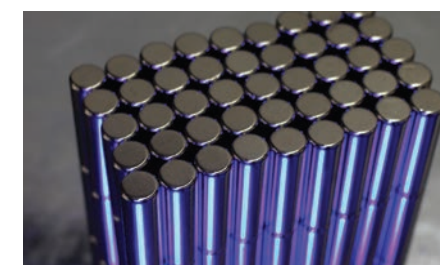
Partner countries: Japan, Republic of Korea, Malaysia and Thailand



### Solar thermal-plasmonic seawater splitting for hydrogen production

**Professor Zongyou Yin**  
The Australian National University

Partner countries: Japan and Singapore



### An additive manufacturing solution to the critical minerals supply challenges in rare earth permanent magnets

**Professor Simon Ringer**  
The University of Sydney

Partner country: Japan



### Injectable hydrogels with biomimetic properties

**Associate Professor Markus Müllner**  
The University of Sydney

Partner country: Republic of Korea



### Advanced green manufacturing and automation technology for next-generation solar cells

**Professor Shujuan Huang**  
Macquarie University

Partner country: Republic of Korea



### Novel manufacturing strategies for electrolyser component manufacture

**Associate Professor Rosalie Hocking FTSE**  
Swinburne University of Technology

Partner country: Thailand



### Forging the future of space tech: ANU and ZES partnership for advancing radiation testing

**Dr Tom McGoram**  
The Australian National University

Partner country: Singapore





ABOVE: Dr Cui Ying Toe (from University of Newcastle) and Dr Denny Gunawan working with a prototype electrolyser device.



**Scientia Professor Rose Amal**  
AC FTSE FAA

Scientia Professor Amal is an internationally-recognised chemical engineering researcher. Her work on particle and catalyst technologies has resulted in safer and cleaner water supplies and fueled dramatic improvements in waste management through innovative approaches to recycling and clean energy. Her achievements have been recognised by her appointment as a Director of an ARC Centre of Excellence and ARC Professorial Fellow and as a UNSW Scientia Professor while still at a relatively early stage of her career. She is both a role model and mentor for women in engineering, a dedicated supervisor and has made a significant contribution to the engineering profession.

► Elected 2012

## Advancing sunlight-to-hydrogen conversion for a sustainable future

**Sunlight is an abundant renewable energy source vital for decarbonisation, energy security and national sovereignty.**

WHILE SOLAR PHOTOVOLTAICS (PV) are effective in converting sunlight into electricity, there is also significant potential to harness solar energy for producing sustainable chemicals and fuels.

By generating renewable feedstocks—such as green hydrogen, ammonia and methanol—solar-driven technologies can support the development of alternative fuels, reducing reliance on finite fossil resources and imported energy. Strengthening domestic fuel production enhances long-term energy security and reinforces national sovereignty. It reduces dependence on global supply chains and mitigates geopolitical risks.

Moreover, as demand for clean energy solutions grows worldwide, Australia is well-positioned to become a major exporter of renewable fuels, leveraging its vast solar resources to support both domestic and international decarbonisation efforts.

### Photocatalysis: direct sunlight-to-hydrogen conversion

Hydrogen can be produced from solar energy through PV-electrolysis, where solar electricity powers water electrolysis to generate hydrogen. However, this method requires expensive infrastructure, making it costly to scale.

Photocatalysis offers a simpler, more cost-effective alternative by converting sunlight directly into hydrogen without the need for solar PV, electrolyzers, or a complex balance of plants.

In photocatalysis, a semiconductor catalyst absorbs sunlight and directly splits water into hydrogen and oxygen. The technology has already been demonstrated at a 100m<sup>2</sup> scale, showing its potential for larger applications.

Beyond water splitting, photocatalysis can also produce hydrogen while converting organic waste—such as agricultural

biomass and plastics—into value-added chemicals. This process, known as photoreforming, enhances sustainability by simultaneously generating clean hydrogen and alleviating a major waste problem.

### The Challenge: boosting efficiency

Despite its promise, commercialisation of photocatalysis is hindered by low solar-to-hydrogen efficiency. Current systems typically achieve only 1-2% efficiencies, making hydrogen production too expensive for widespread adoption.

Our techno-economic assessment suggests that if solar-to-hydrogen efficiency surpasses 5%, photocatalysis could produce hydrogen for around \$2 per kilogram—a target for commercial viability.

### A global push to overcome the efficiency barrier

Achieving this leap in efficiency requires global collaboration. The solar PV industry has shown how collective scientific advancements can dramatically improve efficiency and reduce costs. Solar hydrogen technology has the potential to follow a similar trajectory, particularly in Australia, which benefits from abundant sunshine and a strong track record in solar energy research.

Led by Scientia Professor Rose Amal from UNSW Sydney, with Dr Denny Gunawan as a key researcher, the new Sunlight-to-Hydrogen Hub—funded by the Global Science and Technology Diplomacy Fund—brings together experts worldwide. International partner institutions include Universiti Malaya (Malaysia), Institut Teknologi Bandung (Indonesia), Nanyang Technological University (Singapore), and the University of Tokyo (Japan), with Australian partners at the University of Newcastle and RMIT University.

The hub will coordinate global research efforts to accelerate progress in photocatalytic solar hydrogen

production. It will focus on three key areas: Photocatalyst Discovery, which involves discovering and optimising new photocatalyst materials to enhance efficiency; System Engineering, which focuses on developing scalable and efficient photoreactors for real-world applications; and Techno-Economic Studies, which aims to develop an open-source cost analysis tool to assess feasibility and guide commercialisation.

Using advanced computational tools, experimental facilities, and augmented intelligence, the hub aims to develop scalable, low-cost systems with improved efficiency, paving the way for industrial adoption and commercialisation.

### More than research: building an innovation ecosystem

Beyond scientific breakthroughs, the hub will play a key role in building a strong innovation ecosystem for solar hydrogen production. Through strategic partnerships with leading companies, the hub will help build a robust ecosystem for renewable energy innovation and accelerating commercialisation. This initiative will not only enhance Australia's capacity in solar hydrogen technology but also create new opportunities in the growing green energy sector.

Importantly, the hub will empower the next generation of scientists and engineers by providing targeted mentorship, training and exchange programs. The hub is committed to building a diverse talent pipeline to drive future advancements in solar hydrogen technologies. By uniting global expertise and resources, this initiative represents a significant step toward turning sunlight into a clean, cost-effective energy source for Australia and the world.

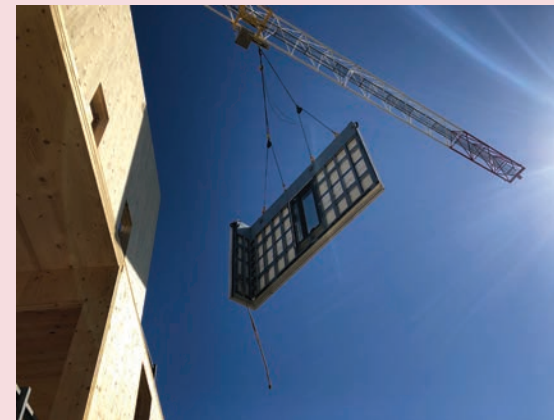


**UN SDGs**  
7 – Affordable and clean energy  
12 – Responsible consumption and production



## Building a sustainable future towards net zero

A whole-life-cycle approach to digital manufacturing of carbon-neutral modular panels for affordable housing



Prefabricated modular panels for housing construction being moved into position.  
Inset image page 51 Professor Tuan Ngo on site.



**Professor Tuan Ngo**  
FTSE

Professor Ngo is a global leader in the field of composite materials and infrastructure resilience. He has pioneered in Australia the research and development of offsite manufacturing, modern methods of construction and the applications of Industry 4.0 in buildings and infrastructure. He has led the development of numerous new materials and innovative lightweight modular building and structural systems with superior thermal-mechanical, acoustic and fire properties, as well as low environmental impact. As a director of PrefabAUS, he has made a significant contribution to establishing and growing a new industry which currently involves more than 200 company members.

▲ Elected 2023

**This project aims to pioneer scientific advances in digitally-enabled manufacturing of next-generation prefabricated modular construction using Carbon-Neutral Modular Panels (CNMP) for affordable housing.**

DIVERGING FROM TRADITIONAL approaches, the leveraging of digital manufacturing for precast panels expedites fast construction to address the housing crisis and enables a step forward in the transition towards net zero building in Australia and Asia-Pacific countries.

Led by Professor Tuan Ngo, the project team comprises world-leading scientists and entrepreneurs with expertise in advanced construction materials, novel designs for lightweight composite structures, sustainable life cycle and supply-chains, renewable energy, AI-based technologies, and experimental forms of prefab manufacturing. By bringing together global industries and experts across top-tier international universities in Japan, Vietnam, Thailand, Malaysia and New Zealand, this project boosts Australia's science and technology capability. Funded by the Global Science and Technology Diplomacy Fund, this work fosters international networks for knowledge exchange through a series of international workshops, and laboratory-based and large-scale testing at manufacturing facilities for demonstrations of real-world impact.

The project builds on extensive expertise in AI technology, renewable energy integration and advanced construction materials. The project methodology leverages cutting-edge research on material composite development, and advanced testing and simulation techniques, supported by the state-of-the-art facilities at the University of Melbourne and those in partner countries.

### Addressing the housing crisis

By leveraging advanced automation and digital integration, innovation in this space can address Australia's critical housing shortage, exacerbated by labour constraints in the construction sector. The primary goal is the establishment of a digitally integrated manufacturing system capable of producing high-performance, energy-efficient and carbon-neutral modular housing at scale.

This will help address Australia's housing crisis, boost housing output and set new benchmarks for sustainable construction. By demonstrating the integration of advanced technologies into construction, this project not only supports environmental sustainability but also contributes to job creation, improvements in living standards and export opportunities in global markets. Aligned with Australia's emission reduction targets, the project contributes to the national priority of achieving net zero emissions by 2050. It will also establish a knowledge-sharing network among partner organisations within the Asia-Pacific region, fostering collaboration and innovation to reduce emissions in the construction sector.

### KEY PROJECT OUTCOMES

**Novel Solutions for Rapid and Affordable Housing:** Modular, carbon-neutral prefabricated building systems, directly addressing the need for affordable, low-emissions housing across Australia and the Asia-Pacific. Alignment with national and regional sustainability goals will ensure the solutions provided are both practical and environmentally responsible.

**Increased Research-Industry Collaboration:** Establishing long-lasting collaborations between academic institutions, industry partners and international stakeholders. By sharing access to state-of-the-art technologies and research facilities, the project will enhance Australia's scientific and technological capabilities in sustainable construction and ensures ongoing collaboration and exchange of expertise, fostering strong partnerships and innovation.

Through this project, Australia will demonstrate its leadership in sustainable prefabricated building technologies for affordable housing. Australia is set to become a leader in rapid construction and net zero building technologies, with the potential to export low-carbon building products and expertise to growing nations in the Asia-Pacific, demonstrating a national commitment to setting new benchmarks in sustainable construction.



UN SDGs

11 – Sustainable cities and communities  
12 – Responsible consumption and growth



By Associate Professor Rosalie Hocking

With Dr Surinder Singh, Dr Thành Tran-Phú, Dr Duy Quang Pham, Associate Professor Andrew Ang



#### Associate Professor Rosalie Hocking

Associate Professor Hocking is a chemist whose research is aimed at the development of electrochemical devices to make commodity chemicals (like hydrogen and ammonia) from solar-derived electricity. Her work makes extensive use of the Australian Synchrotron where she uses X-rays to find out how new materials work, and why sometimes they don't! She is also researching the development of cheap sensor devices that would provide instantaneous chemical information, important in applications like asbestos identification on building sites.

## Bridging innovation

### Australia-Thailand collaboration in electrolyser component manufacturing

**The global push for carbon neutrality by 2050 calls for novel solutions to decarbonise hard-to-abate sectors such as industrial chemical manufacturing, which accounts for 10-24% of global greenhouse gas emissions.**

WHILE INDUSTRIAL CHEMICAL manufacturers have made efforts to reduce emissions, their processes still release significant amounts of CO<sub>2</sub> into the atmosphere. A promising approach is to use renewable energy sources to power electrolysers that convert atmospheric CO<sub>2</sub> into valuable fuels and chemicals, reducing the net CO<sub>2</sub> emissions from these processes. However, significant technological hurdles must be overcome before this becomes a large-scale solution.

#### A collaborative approach to green Chemistry

The Australia-Thailand collaboration on Electrolyser Component Manufacture, brings together world-class expertise in nanomaterials, advanced manufacturing and electrolyser design. Led by leading

researchers from Australia's Swinburne University of Technology (SUT) and Thailand's Rajamangala University of Technology Phra Nakhon (RMUTP), this partnership aims to advance electrolyser component manufacturing for efficient CO<sub>2</sub> conversion.

#### Current challenges

Although high-rate reactions can be achieved in the short term, current alkaline CO<sub>2</sub> conversion technologies struggle to sustain performance over extended operation. The CO<sub>2</sub> reaction with hydroxide ions forms carbonate and bicarbonate (HCO<sub>3</sub><sup>-</sup>), leading to CO<sub>2</sub> losses and requiring higher feed rates to compensate. This also increases energy consumption and causes operational issues that can shorten electrolyser lifetimes.

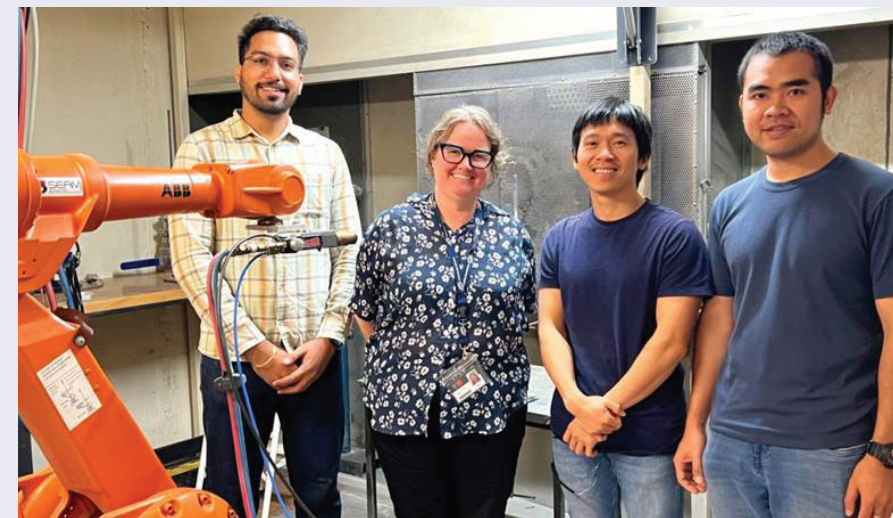
#### What could be the solution?

Acidic CO<sub>2</sub> reduction prevents carbonate formation, which enhances CO<sub>2</sub> utilisation and efficiency, making it more energy-efficient and industrially viable.

#### Innovation in electrolyser components

This project aims to develop innovative catalysts that can operate in acidic environments while suppressing the competing hydrogen-evolving reaction. Specifically, it focuses on integrating electrochemically active copper sites with acid-stable components, such as bismuth oxide, to develop durable acid-resistant electrodes.

To achieve this, the research team is using advanced thermal and cold spray coating techniques to fabricate durable and high-performance electrodes. The spray techniques allow for precise control over coating composition, surface roughness and porosity — key factors that influence electrochemical performance.



Above: The Swinburne team inside the thermal spray booth, Chief Investigator Associate Professor Rosalie Hocking (2nd left) along with early career researchers; Dr Thành Tran-Phú (2nd right), Dr Duy Quang Pham (right), and Dr Surinder Singh (left).



#### UN SDGs

- 7 - Affordable and clean energy
- 9 - Industry, innovation and infrastructure
- 12 - Responsible consumption and production

By leveraging the unique spray facilities at SUT and RMUTP, the project will scale up catalyst-coated electrodes to a practical size of 25cm<sup>2</sup>. These electrodes will serve as critical components in next-generation electrolysers, enabling efficient and selective CO<sub>2</sub> reduction at an industrial scale.

#### Strength in collaboration: SUT Australia and RMUTP Thailand

The success of this project will be driven by the complementary expertise of the Chief Investigators and the team members, along with access to advanced high-end facilities at RMUTP and SUT. Associate Professor Rosalie Hocking and Dr Jirasak Tharajak bring expertise in nanomaterials and electrocatalyst characterisation, while Dr Thành Tran-Phú focuses on accelerating electrolyser design and operation. Associate Professor Andrew Ang, Dr Poomirat Nawarat, Dr Surinder Singh, and Dr Duy Quang Pham specialise in advanced manufacturing and thermal

spray processes. RMUTP's state-of-the-art cold spray facilities and SUT's advanced suspension plasma spray technology play crucial roles in scaling up catalyst-coated electrodes. The project also benefits from in situ characterisation methods, including synchrotron-based X-ray imaging and X-ray absorption spectroscopy, enabled by the Australian Synchrotron.

By combining cutting-edge facilities, interdisciplinary expertise and strong international collaboration, this project aims to revolutionise electrolyser technology, strengthening Australia's and Thailand's positions as leaders in the clean energy transition.

#### Benefits

This collaboration between Australia and Thailand offers significant national and international benefits, strengthening professional linkages with global institutions like RMUTP. It grants Australian researchers access to cutting-edge cold spray and electrochemical technologies

while fostering economic growth through scalable CO<sub>2</sub> electrolysers. Additionally, advancements in catalyst stability and electrode engineering will drive innovation in energy conversion technologies.

#### Towards commercialisation and impact

Beyond fundamental research, this collaboration is committed to scaling innovations for commercial deployment. By optimising fabrication processes, the team aims to produce robust, cost-effective electrolyser components ready for market integration.

By leveraging cutting-edge research, advanced manufacturing and international collaboration, the Australia-Thailand Electrolyser Component Manufacture project is set to drive significant progress in green chemistry and industrial decarbonisation. This partnership not only strengthens bilateral ties but also paves the way for innovative solutions in the global clean energy transition.





# Empowering great ideas for tomorrow's horticulture

Teaming up with local and global innovators, Hort Innovation's Frontiers invests in seizing big opportunities and developing solutions to horticulture's major challenges.

**Find out more at [www.frontiers.au](http://www.frontiers.au)**

Hort Innovation  
**Frontiers®**





# Global impact through Australian fruit fly innovation

Fruit flies in the insect family Tephritidae are found worldwide, and some species are major pests of fruits and vegetables.

IN AUSTRALIA, OUR research has focused on a sub-family of approximately 800 species across the tropics and subtropics, within which we have identified 48 major pest species from the Indian subcontinent, across Southeast Asia and the Pacific regions where different pest species attack different crops in each country.

The economic impacts of these insects are:

**Major crop losses through direct attack:** In developed countries, this has significant repercussions for farmer economies. In developing countries, crop losses lead to serious malnutrition, especially through the lack of fruit and vegetables in the diet of children.

**High costs of national and international biosecurity programs to prevent the introduction of fruit fly pest species into new geographic zones:** Restrictions on trade and expensive quarantine surveys are necessary.

**Eradication of new outbreaks in new zones if and when they occur:** An introduction of a major pest species from Southeast Asia into North Queensland resulted in a costly eradication program between 1996 and 2000.

## Timing

In Australia, withdrawal of permits for pesticide cover sprays resulted in the need for alternative technology, safe to humans and the environment. We built upon our comprehensive research in species identification, ecology and pest species biology to develop a new world-first technology, Fruition® Nova, designed to attract and kill mature egg-laying female fruit flies that do the damage.

## Research to discovery

At Griffith University, we identified volatile chemicals – emitted by ripe fruit – that attract mature female fruit flies to lay their eggs. A series of laboratory and field experiments led us to develop a mixture of volatiles that were attractive to Queensland fruit fly, our major pest species. Following the University applying for a Provisional Patent, an industry partner, Ag Nova Technologies, was licensed to develop a commercial product.

## The road to commercialisation

The perennial challenge of commercialisation in Australia, the transfer of research to commercial products is fraught. However, our researchers and Ag Nova Technologies Pty Ltd worked tirelessly over some eight years to transfer the initial synthetic lure discovery into a commercially viable product.

This applied research phase included the development of a slow-release gelatinous form of the lure, a trap design including a particular shape and colour shown by our previous research to attract a range of fruit fly pest species, and a sticky surface sufficient to adhere flies but not other beneficial insects. Ag Nova played a major role in supporting and facilitating this applied research and in establishing a full patent in Australia and other countries in our region.

## Proof of concept

After developing this technology, it was essential that its efficacy could be proven in commercial plantations. Extensive field trials conducted in Southeast Queensland in a range of fruit crops provided confidence to recommend the use of the trap to all horticultural industries that are subject to fruit fly attack. In one remarkable example, on a 15 hectare persimmon plantation, crop losses were reduced from 50% to less than 2% through use of the Fruition® Nova device. In India, this Fruition technology has proven successful in a range of crops:

- On gherkin plantations, crop losses to fruit flies have been markedly reduced resulting in an increase in production of 1,900kg/ha. This benefit will flow on to 90,000 farmers supplying 51 processing factories.
- Similarly, a 30% increase in mango production and 40% increase in guavas have come about through the use application of Fruition® Nova

We are now conducting field trials in the Pacific nation of Tonga.

To date, some 20 fruit fly species are found to be attracted to this new female fruit fly trapping technology.

## Conclusion

Australian-based research is providing solutions to a world-wide problem. As we have demonstrated, pure research twinned with applied research and industry collaboration can provide outstanding advancements in innovative, high-impact outcomes for health, economies, humanity and the environment.

Australian aid programs financed our early fruit fly research in many countries across Southeast Asia and the Pacific. In the early years of this century, we introduced yeast protein baits which yielded significant benefit. Among the many success stories, one that stands out is in northern Vietnam where hill tribe children were able to eat fresh fruit for the first time in generations.



Professor Richard Drew  
AM FTSE

In over 150 published papers Richard has identified the major fruit fly pest species across the entire region and developed important pest management strategies for fruit and vegetable growers, and more importantly, subsistence farmers throughout many developing countries. His recent contribution has been the development of a world first female fruit fly trap which is now providing high level pest management by trapping out the female fruit flies before they lay eggs in fruit. It has been exciting to see the Fruition® Nova fruit fly trap now being marketed by an Australian company, AgNova, marketed to growers in eastern Australia and now in India and Taiwan.



The new Fruition® trapping technology is making a mark in areas of Australia combatting fruit fly infestations, and is transforming the lives of affected communities from Asia to the eastern Pacific, with positive economic impact as well.

📺 WATCH A VIDEO ABOUT THE TRAP

[Fruition® Nova trap assembly](#)



By Emeritus Professor Graham Schaffer FTSE

# Academic volunteering across the Indo-Pacific



**Emeritus Professor Graham Schaffer**  
FTSE

Professor Schaffer is Chair of Australian Academic Volunteers Abroad, Professor Emeritus at The University of Queensland, Honorary Professor at The University of Melbourne and Adjunct Professor at the University of the South Pacific. He was previously Dean of the Melbourne School of Engineering at The University of Melbourne, Pro Vice-Chancellor for the College of Science, Health and Engineering at La Trobe University and Executive Dean of Engineering, Architecture and Information Technology at The University of Queensland.

▲ Elected 2008

LAST YEAR, I spent three months living and working in Fiji on the beautiful Suva campus of the University of the South Pacific (USP) as a volunteer with Australian Academic Volunteers Abroad (AAVA) and the Australian Volunteers Program (AVP). This was the in-country component of a 12-month assignment to establish an academic volunteering program designed specifically to attract academic leaders who can support universities across the Indo-Pacific region and enable the careers of others.

Following me this year will be eight retired Professors (six women, two men) who will spend a combined 27 months in-country volunteering at USP in Fiji, the Solomon Islands National University, the International Institute of Health Sciences in Sri Lanka and the German – Mongolian Institute of Resources and Technology in Ulaanbaatar. They will support everything from civil

engineering, nursing and psychology to quality assurance and research commercialisation.

We established AAVA in 2023 as a not-for-profit organisation dedicated to sharing the transformative power of education. Through AAVA, we aim to support our neighbours and their universities because education transforms lives. By enhancing the capacity of individuals, education can also transform families, communities and nations. Education breaks down barriers, leading to diversity, inclusion and social cohesion.

We support the goals and aspirations of universities by matching their strategic priorities in teaching and research with suitably qualified and motivated volunteers who are current or recently retired senior academic staff. Our assignments are designed and

developed by our university partners to support their strategic development goals. Our priority is capacity building – not direct teaching and research – with a focus on long term assignments rather than short term transactional approaches which have proved counterproductive in the past. Each volunteer assignment is typically 12 months, with a mixture of in-country and remote components.

We are an Australian Partner Organisation with the Australian Volunteers Program (AVP), the Australian Government-funded initiative that supports global volunteering. Our volunteers are mobilised through AVP.

A key difficulty faced by universities across the Indo-Pacific is the provision of academic leadership at the discipline level. This is the role of the Professoriate. For example USP has 13 professors. By

comparison, Charles Darwin University, which is also a dual-sector university with a similar student enrolment, has 50 professors. The University of Melbourne has 50 professors in engineering alone. There are no professors at USP in key disciplines including Agriculture, Civil Engineering, Climatology, Information Technology and Psychology. The cause is multi-faceted, including budgetary constraints, the difficulty in attracting and retaining senior scholars, and the difficulty for junior staff to be promoted when they do not have the senior leadership for mentoring and support. This situation is essentially replicated at other universities across the region.

Additionally, as universities seek to ensure mobility for their graduates, quality assurance, accreditation and international comparability of programs becomes more critical. Robust evaluation of teaching and learning

and staff development are further opportunities for the engagement of experienced academics to enhance the quality of university offerings, while enabling the careers of others and building networks of scholars across institutions.

Like a sabbatical in retirement, my experience as an academic volunteer was a wonderful adventure, meeting interesting people and working with brilliant colleagues and enthusiastic students. Living as a quasi-local with humility and empathy, it is a safe and affordable way to make a difference. And as the research has shown, long term volunteering is known to reduce loneliness and depression, and increase happiness and longevity.

**To express an interest in volunteering at a university across the region, email [admin@academicvolunteers.org.au](mailto:admin@academicvolunteers.org.au)**



The University of the South Pacific has a presence in the Cook Islands, Emalus, Fiji, Kiribati, Labasa, Lautoka, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tokelau, Tonga and Tuvalu



UN SDGs  
4 – Quality education  
8 – Decent work and economic growth



# Strategic advice



FEBRUARY 2025

## Boosting Australia's Innovation

Australia stands at a critical juncture in its journey to boost the national innovation ecosystem. Institutional reform, targeted investment, increased collaboration and improved evaluation will create an innovation sector that can commercialise, iterate, experiment and develop the technologies to support better lives in Australia and around the world. Drawing on expert consultations, this report presents key insights and strategies for the government, research institutes, investors and businesses to revitalise the Australian innovation landscape.

📖 READ THE REPORT

**Boosting Australia's innovation: Practical steps for boosting Australia's innovation ecosystem**



FEBRUARY 2025

## Victorian STEM investment critical for driving innovation

The Royal Society of Victoria, Australian Academy of Technological Sciences & Engineering, and the Science Teachers' Association of Victoria call on the Victorian Government to enhance the status of science in the Victorian Curriculum, support a higher standard of STEM teaching, and unlock access to more hands-on experience-based learning in the state to drive aspiration, access and attainment for more students. This could be underpinned by the establishment of a STEM Education Future Fund to provide dedicated resourcing.

📖 READ THE REPORT

**Victorian STEM investment critical for driving innovation**



DECEMBER 2024

## Offshore oil and gas decommissioning: Technologies

This report explores technologies and career opportunities associated with the decommissioning of Australian offshore oil and gas (OO&G) facilities.

A large number of Australian offshore oil and gas facilities are increasingly reaching the end of their service life. Decommissioning of these facilities represents a gradually increasing burden on the offshore industry and is expected to cost the nation in excess of AUD \$61 billion over the next 50 years.

The report features a technology horizon scan for current and emerging technologies that can directly and indirectly support the decommissioning process over the next 30 years along the value chain. Australia's research strengths and gaps were also explored, with recommendations and national priorities put forward to support the decommissioning sector.

📖 READ THE REPORT

**Offshore oil and gas decommissioning: Technologies**

📖 READ ALL OUR STRATEGIC ADVICE

**All ATSE publications and submissions can be found on our website**



# Movers & shakers



**Dr Angeline Achariya**  
FTSE

Dr Achariya has been appointed as a Board Director of Industry Innovation and Science Australia, bringing her valuable expertise and leadership to the organisation.



**Louise Adams**  
FTSE

Louise has been appointed as Aurecon's CEO, succeeding William Cox FTSE, from 1 July 2025. Her appointment reflects her outstanding track record of building an engaged culture, delivering strong financial performance and excellence in client services. Louise has also been named to the inaugural Advisory Board of the ASEAN-Australia Centre.



**Professor Rose Amal**  
AC FTSE FAA

Professor Amal was awarded \$749,600 through the Global Science and Technology Diplomacy Fund - Strategic Element from the Department of Industry, Science and Resources, delivered by ATSE in collaboration with the Australian Academy of Science.



**Professor Joanna Batstone**  
FTSE

Professor Batstone will join the Royal Society of Victoria's Governing Council for a two-year term, commencing in May 2025.



**Distinguished Professor Genevieve Bell**  
AO FTSE FAHA FASSA

Professor Bell has been named a Fellow of the Australian Academy of Social Sciences.



**Emeritus Professor Andrew Blakers**  
AO FTSE FAA

Professor Blakers has been appointed as an Officer of the Order of Australia for outstanding contributions to solar cell development and advocacy for energy storage and renewables.



**Leeanne Bond**  
FTSE FAICD

Leeanne Bond has been appointed as the chair of the Queensland Energy System Advisory Board. Also, Leeanne was also announced as a finalist for the Business Excellence and Leadership Award in the MBA Australasia Awards 2024.



**Drew Clarke**  
AO FTSE

Drew has been awarded an Honorary Doctorate by ANU in recognition of his outstanding contributions to public policy and administration in Australia.



**Dr Helen Cleugh**  
FTSE

Dr Cleugh has been awarded the Morton Medal for 2024 by the Australian Meteorological and Oceanographic Society.



**Dr Therese Flapper**  
FTSE

Dr Flapper has been named a Board Member of the ACT Board of Engineering Excellence and a Deputy Board Member of the Tasmanian Environment Protection Authority.



**Dr Cathy Foley**  
AO PSM FTSE FAA

Dr Foley has been named as the national recipient of the Australian Awards for Excellence in Women's Leadership. She is recognised for her contribution as a trailblazer for women and girls in STEM. Also Dr Foley was appointed to lead an expert methane reporting panel for the Federal Government.



**Professor Stephen Foster**  
FTSE

Professor Foster has been awarded the Structural College John Connell Gold Medal at the Engineers Australia Excellence Awards.



**Professor Bronwyn Fox**  
AO FTSE

Professor Fox has been appointed an Officer of the Order of Australia for distinguished service to public administration, scientific research and development, advanced manufacturing and tertiary education.



**Professor Ranjith Pathegama Gamage**  
FTSE

Professor Gamage has been recognised as a Fulbright Senior Scholar, in support of his innovative work to advance next-generation mineral recovery technology. His research focuses on developing innovative, low-energy and waste-free rock-breaking methods to support the critical mineral supply chain.



**Professor Barney Glover**  
AO FTSE

Professor Glover was appointed to the interim Australian Tertiary Education Commission.



**Professor Keith Hampson**  
FTSE FAICD

Professor Hampson was elected an international Fellow of the Royal Swedish Academy of Engineering Sciences (IVA).



**Professor Tony Haymet**  
FTSE

Professor Haymet has been appointed as Australia's Chief Scientist. He is a highly regarded Fellow within ATSE, a global leader in ocean research and an advocate for Australian science and research capability and infrastructure.



**Distinguished Professor Buddhima Indraratna**  
AM FTSE

Distinguished Professor Indraratna has been honoured as the Civil College Sir John Holland Civil Engineer of the Year at the Engineers Australia Excellence Awards.



**Professor Emma Johnston**  
AO FTSE FAA

Professor Johnston has been announced as the first woman Vice-Chancellor of the University of Melbourne.



**Dr Marlene Kanga**  
AO FTSE FREng FAICD

Dr Marlene Kanga was awarded an Honorary Doctorate of Engineering from the University of New South Wales in recognition of her eminent service in advancing global engineering standards, engineering leadership, promoting diversity, ethical practices, and sustainable development. Dr Kanga was also awarded the Peter Nicol Russell Medal at the 2024 Engineers Australia Excellence Awards, and Dr Kanga also received the International Distinction Award from the Order of Engineers of Portugal.



**Dr Sue Keay**  
FTSE

Dr Keay has been appointed as the Director of the UNSW AI Institute.



**Professor Max Lu**  
AO FTSE FAA

Professor Lu has been appointed as the Vice-Chancellor and President of the University of Wollongong.



**Professor Douglas MacFarlane**  
FRS FTSE FAA

Professor MacFarlane has been reappointed as a Sir John Monash Distinguished Professor at Monash University in recognition of his constant drive to innovate in renewable energy technologies and sustainable energy solutions.



**Sue MacLeman**  
FTSE FAICD

Sue MacLeman has been named the new Chair of Medicines Australia. A member of ATSE's Board, Sue has more than 30 years' experience as a pharmaceutical, biotechnology and medical technology executive, having held senior roles across Australia's corporate and life sciences sector.





**Emeritus Professor Michael McLaughlin**  
AM FTSE FAA

Professor McLaughlin has been elected as a Fellow of the US National Academy of Inventors for his exceptional contributions to innovation, economic development and societal well-being.



**Professor Anna Moore**  
FTSE

Professor Moore has been awarded the Jackson-Gwilt Medal at the Royal Astronomical Society Awards 2025. The medal recognises outstanding invention, improvement, or development of astronomical or geophysical instrumentation or techniques.



**Professor Graham Nathan**  
FTSE

Professor 'Gus' Nathan FTSE was recognised with an Enduring Industry-Research Collaboration award at Cooperative Research Australia's (CRA) annual Collaborate Innovate Conference.



**Professor Tuan Ngo**  
FTSE

Professor Ngo was awarded \$599,445 through the Global Science and Technology Diplomacy Fund - Strategic Element from the Department of Industry, Science and Resources, delivered by ATSE in collaboration with the Australian Academy of Science.



**Professor Thas Nirmalathas**  
FTSE

Thas Nirmalathas has been named Dean of the Faculty of Engineering and Information Technology at the University of Melbourne.



**Professor Mary O'Kane**  
AC FTSE

Professor O'Kane was appointed as the interim Chief Commissioner of the Australian Tertiary Education Commission.



**Dr Ian Oppermann**  
FTSE

Dr Oppermann has been appointed to the WA Government's new AI Advisory Board for his extensive experience as the former NSW Government Chief Data Scientist and his leadership in AI, data science and digital transformation.



**Professor Sarah Pearson**  
FTSE

Professor Pearson has been named the next Chancellor of the University of New England.



**Professor Chamindie Punyadeera**  
FTSE

Professor Punyadeera successfully secured an Australian Research Council Discovery Project Grant as Chief Investigator B led by Charles Sturt University for the project entitled: Capturing elusive bionanoparticles via oscillating field induced convection. Professor Punyadeera was also awarded the Innovator Award at the Women of Colour in STEM Awards 2024.



**Adjunct Professor Craig Rayner**  
AM FTSE FAHMS

Professor Rayner has been appointed as a Member of the Order of Australia for significant service to pharmacology in a range of roles and organisations. He has also been elected a Fellow of the Australian Academy of Health and Medical Sciences.



**Professor Simon Ringer**  
FTSE

Professor Ringer was awarded \$999,829 through the Global Science and Technology Diplomacy Fund - Strategic Element from the Department of Industry, Science and Resources, delivered by ATSE in collaboration with the Australian Academy of Science.



**Scientia Professor Veena Sahajwalla**  
AO FTSE FAA

Professor Sahajwalla has been appointed as an Officer of the Order of Australia for outstanding contributions to engineering, sustainable materials research and technology & waste management. Also, Professor Sahajwalla has been appointed to Science & Technology Australia's Bench-to-Boardroom Committee.



**Distinguished Professor Brian Schmidt**  
AC FRS FTSE FAA

Professor Brian Schmidt AC FRS FTSE FAA has been appointed President-Elect of the International Astronomical Union.



**Professor Murray Scott**  
FTSE FAICD

Professor Scott has been elected as an Honorary Fellow of Engineers Australia for his contributions to the aerospace engineering profession, adherence to the highest technical and professional standards and dedicated service to the Australian engineering community.



**Professor Cordelia Selomulya**  
FTSE

Professor Cordelia Selomulya has been elected a Fellow of US-based Institute of Food Technologists for significant service, leadership, and contributions to food science and engineering. Election to the Institute of Food Technologists is one of the highest honours in the science of food community.



**Distinguished Professor Vivian Tam**  
FTSE

Professor Tam was awarded the Scientific Research Award at the Women of Colour in STEM Awards 2024.



**Professor Michael Tobar**  
FTSE FAA

Professor Tobar was awarded the European Frequency and Time Award in recognition of outstanding contributions to the development of precision frequency and measurement technology and its application to oscillators, clocks, precision sensing and testing fundamental physics. Also, Professor Tobar has been awarded the Massey Medal of the Australian Institute of Physics.



**Professor Svetha Venkatesh**  
FTSE FAA

Professor Svetha Venkatesh, Distinguished Professor and co-director at the Applied Artificial Intelligence Institute, Deakin University was awarded the 2024 Pearcey Medal and inducted into the Pearcey Hall of Fame.



**Professor Andrew Wilks**  
FTSE FAA FAHMS

Professor Wilks has been honoured with the 2024 Prime Minister's Prize for Innovation.



**Sally-Ann Williams**  
FTSE

Sally-Ann Williams has been named to the Board of the Australian Research Council.



**Professor Hala Zreiqat**  
AM FTSE FAA FAHMS

Professor Zreiqat has been inducted into the American Institute for Medical and Biological Engineering College of Fellows 2025.



# Vale



**Sir Roderick Carnegie**

AC FTSE

**Sir Rod Carnegie was elected to the Academy in 1985 for his contributions to mining and business leadership in Australia and around the world.**

Sir Rod had a long career in industry in the USA, Europe and Australia, working for significant global businesses McKinsey, in the consulting space, and CRA (now RioTinto), in mining.

He also served as Director on the boards of multiple well-known organisations, including General Motors, CSIRO, the Business Council of Australia, and the Group of Thirty, and was chairman of the Advisory Committee on Relations with Japan.

Rod was awarded a Knight Bachelor in 1978 in recognition of his services to industry, and in 2001 was awarded a Centenary Medal for his service to Australian society in resource development and management. In 2003 he was awarded Companion of the Order of Australia in recognition of his service to the promotion of innovative leadership and to the development of competitive practices in business.



**Dr Leonard John Hart-Smith**

FTSE

**Dr Leonard John Hart-Smith — known as John — was elected to the Academy in 1998 in recognition of his role as a world leader on composite materials manufacturing and design.**

At the time of his election, John was recognised globally for his innovative research on the analysis of adhesively bonded joints in both metallic and advanced fibre composite structures.

His many seminal publications in the scientific literature also led to a series of computer programs used extensively around the world in critical aircraft design, including on the F/A-18 Hornet.

Over the course of his career, he spent many years in the United States as an engineer with Douglas Aircraft, and later, with Boeing. Even after his retirement in 2008, he continued as a consultant advising on planes including the 787 Dreamliner.

Throughout his career, he was considered an expert on composites manufacturing technology with an almost innate understanding of stress and mechanical behaviours in aircraft materials.

Right up to his death, he was working on papers about how thin-shell structures like airplane fuselages buckle under pressure.



**Professor Alan Robson**

AO FTSE

**Professor Alan Robson was elected to the Academy in 1987 based on his international reputation and contributions to the science of plant nutrition with direct applications to improving agriculture.**

His long career in research and academia included many years as Vice-Chancellor and Deputy Vice-Chancellor of the University of Western Australia. During his career, he was also Foundation Director of the Cooperative Research Centre for Legumes in Mediterranean Agriculture, Dean of the Faculty of Agriculture, Professor of Agriculture (Soil Science), and Hackett Chair in Agriculture until his retirement.

Through his research, he developed diagnostic tests for nutrient disorders in cereals, grains and pasture legumes, which were adopted by fertiliser companies and advisory groups around the world.

He also spent time on the Board of CSIRO, as Deputy Chair of Universities Australia, Deputy Chair of the Council of the National Library and Chair of the Group of Eight.



**David Singleton**

FTSE

**David Singleton was elected to the Academy in 2003 in recognition of his leadership of international engineering firm Arup, and his special skills in transportation engineering.**

He played an important role in the growth of Arup into a global consulting firm through a number of roles including as CEO of Arup Australasia and as Chairman of Global Infrastructure in the UK. He was five times named amongst the 100 Most Influential Engineers in Australia by Engineers Australia.

A person with a keen interest in technological aid for developing countries, he was also particularly interested in drawing the engineering profession together as Director of Standards Australia and through leadership in Engineers Australia, the Swinburne University of Technology board, and the Infrastructure Sustainability Council of Australia.

A long-time advocate for engineering, he was highly regarded as a mentor, visionary leader and supporter of the broader engineering industry.



**Dr Iris Depaz**

FTSE

**Dr Iris Depaz was elected to the Academy in 2024, with her Fellowship awarded posthumously following her passing ahead of the induction ceremony.**

She was elected in recognition of her influence on creating impact through medical research and bringing it into the clinic.

Dr Depaz profoundly changed the model for the translation and commercialisation of medical research into the clinic in Australia, establishing a first-of-its-kind, global scientific community focused on mRNA technology and translational science.

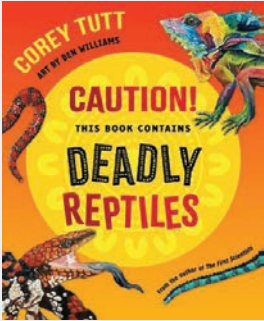
She led digital health projects using artificial intelligence and led the development of the first pneumococcal vaccine for ear disease in Indigenous children. She also commissioned training programs to combat vaccine hesitancy, rolled out to thousands of health professionals.

Dr Depaz was known for her visionary leadership, her mentorship of researchers moving into industry, and her ability to engage widely to create impact. She was a dedicated and passionate champion of growing pharmaceutical and health technology companies in Australia.



# What we're reading & watching

BOOK



**Caution! This Book Contains Deadly Reptiles**

By Associate Professor Corey Tutt AM and illustrated by Ben Williams

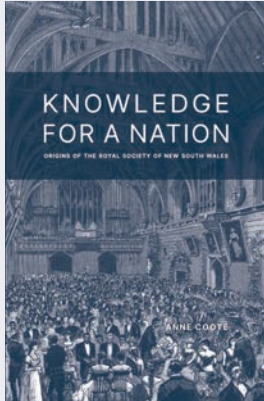
This is the ultimate reptile book for kids by DeadlyScience founder Corey Tutt, bestselling author of *The First Scientists*. Bursting with vibrant illustrations and cool facts about more than 60 reptiles, Corey celebrates First Nations knowledge about animals found on Country, from lizards and snakes to turtles and crocodiles.

As a child, Corey would run barefoot across fields, climb rocks, jump into creeks and explore red sands in search of reptiles. The only reference books he could find included European and Latin names, but as a Kamilaroi man, Corey was keen to learn reptile names in First Languages.

Sharing knowledge from 20 different First Nations, *Caution! This Book Contains Deadly Reptiles* is a reptile book unlike any you've seen before. For each reptile featured, you'll discover its name in a First Language, plus learn about favourite feeds, breeding and babies, conservation, predators and prey, and most importantly, what makes that reptile deadly (in a good way). There are also descriptions of the landscapes where you can spot these reptiles, and Ben Williams' colourful illustrations will have you turning every page in wonder.

2025, Allen & Unwin

BOOK



**Knowledge for a Nation: Origins of The Royal Society of New South Wales**

*Knowledge for a Nation: Origins of the Royal Society of New South Wales* tells the early history of a learned society still active in the intellectual culture of 21st century Australia. The book begins with an account of Australia's first learned society, the Philosophical Society of Australasia (1821-1822), which is the Royal Society's enduring inspiration, if not its earliest incarnation. The Royal Society evolved from the Australian Society (1850-1851), through the Philosophical Society of New South Wales, which was re-badged Royal in 1866.

Successfully reorganised a decade later, the RSNSW reached the zenith of its influence on the development of a colonial science community in New South Wales. Hopes and disappointments, conflict and camaraderie, challenges and achievements are all part of this story which highlights the Society's initiatives in the cause of science, its all-male membership, the women who nevertheless contributed, and the society's glittering conversaciones.

2024, *The Royal Society of New South Wales*

WATCH



**Chasing Ice**

In the spring of 2005, acclaimed environmental photographer James Balog headed to the Arctic on a tricky assignment for National Geographic: to capture images to help tell the story of the Earth's changing climate. Even with a scientific upbringing, Balog had been a skeptic about climate change. But that first trip north opened his eyes to the biggest story in human history and sparked a challenge within him that would put his career and his very well-being at risk.

*Chasing Ice* is the story of one man's mission to change the tide of history by gathering undeniable evidence of our changing planet. Within months of that first trip to Iceland, he conceived the boldest expedition of his life: The Extreme Ice Survey. With a band of young adventurers in tow, Balog began deploying revolutionary time-lapse cameras across the brutal Arctic to capture a multi-year record of the world's changing glaciers.

2012, [chasingice.com](http://chasingice.com)



# Publications by ATSE Fellows

BOOK



## Faking It – Artificial Intelligence in a Human World

By Scientia Professor Toby Walsh FTSE FAA

Artificial intelligence is, as the name suggests, artificial and fundamentally different to human intelligence. Yet often the goal of AI is to fake human intelligence. This deceit has been there from the very beginning. We’ve been trying to fake it since Alan Turing answered the question ‘Can machines think?’ by proposing that machines pretend to be humans.

Now we are starting to build AI that truly deceives us. Powerful AIs such as ChatGPT can convince us they are intelligent and blur the distinction between what is real and what is simulated. In reality, they lack true understanding, sentience and common sense. But this doesn’t mean they can’t change the world.

Can AI systems ever be creative? Can they be moral? What can we do to ensure they are not harmful? In this fun and fascinating book, Professor Walsh explores all the ways AI fakes it, and what this means for humanity – now and in the future.

2024, La Trobe University Press

BOOK



## Charan Chantalakhana: Thailand’s International Scientist

By Emeritus Professor Lindsay Falvey FTSE

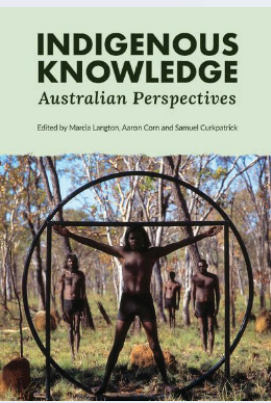
As Thailand rose with the world order since WWII, its reputation in the international agricultural sciences owed much to one person: Charan Chantalakhana was the man for the times.

As the Vietnam conflict stimulated massive US influence in Thailand, more benign stars aligned to build on Charan’s remote Siamese origins and guide him through a leading US university. This biography includes his pioneering Kasetsart University work in animal science research and his leadership in Thai universities, his role in the peak international research body the CGIAR and in the International Livestock Research Institute, and some of his many accolades.

Perhaps of even greater human interest, Falvey’s work also traces Charan’s inspirational life from Siam’s obscure deep south, through his early truancy years before being shepherd by mentors until he himself became an outstanding mentor for Southeast Asia and the global advocate for smallholder farmers.

2024, Institute of International Development

BOOK



## Indigenous Knowledge – Australian Perspectives

Edited by Professor Marcia Langton AO FTSE, Aaron Corn, Samuel Curkpatrick

How are we to live well with others? How can we sustain abundant environments and nourishing cultures? How might connections to place and generations past strengthen our cultural, political and economic futures?

Indigenous Knowledge traditions have been fundamental to human life in Australia for countless generations. They carry understandings of ancestral histories, and exemplify beneficial behaviours for living well on country, managing environmental resources and maintaining social cohesion. Australia has developed collaborative approaches to Indigenous Knowledge research that are unique in the global context. These approaches centre the wisdom of Indigenous Knowledge-holders across interdisciplinary fields

of enquiry as diverse as medicine, health and wellbeing, social and economic development, environmental management, agriculture and horticulture, history, law and the creative arts. *Indigenous Knowledge: Australian Perspectives* reveals how Indigenous ways of being and knowing are intricately tied to place, expressed through beauty, and resound with wisdom. It argues that the world’s contemporary challenges can be addressed, and socio-environmental diversity sustained, through conversations with both our ancestral pasts and the ancestral futures that we leave behind.

2024, The Miegunyah Press  
[mup.com.au](http://mup.com.au)



# ATSE supports the United Nations Sustainable Development Goals



As a national Academy with many connections to international researchers and with a large number of Fellows working towards global solutions for issues such as climate change, pandemics, and food security, ATSE has strong alignment with the 17 United Nations Sustainable Development Goals (SDGs). In order to make the 2030 Agenda a reality, broad ownership of the SDGs must translate into a strong commitment by all stakeholders to implement the global goals.

IMPACT features icons alongside featured articles indicating which Goals the article relates to. We hope this helps you see the wide range of problems that ATSE Fellows are involved in solving. We believe this can shape discussions about how Australian applied scientists, engineers and technologists are driving change to create peace and prosperity for people and the planet, now and into the future. The UN SDGs provide a framework we can use to organise Academy efforts against an accepted global taxonomy, and as a logical, useful mapping tool for our reports and studies.

**What are the SDGs?**  
The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries – developed and developing – in a global partnership. Interconnected, they recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth, all while tackling climate change and working to preserve our oceans and forests.



- 1

End poverty in all its forms everywhere.
- 2

End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
- 3

Ensure healthy lives and promote well-being for all at all ages.
- 4

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- 5

Achieve gender equality and empower all women and girls.
- 6

Ensure availability and sustainable management of water and sanitation for all.
- 7

Ensure access to affordable, reliable, sustainable and modern energy for all.
- 8

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- 9

Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.
- 10

Reduce income inequality within and among countries.
- 11

Make cities and human settlements inclusive, safe, resilient, and sustainable.
- 12

Ensure sustainable consumption and production patterns.
- 13

Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.
- 14

Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
- 15

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss.
- 16

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
- 17

Strengthen the means of implementation and revitalise the global partnership for sustainable development.

## Support our work

For 50 years, the Australian Academy of Technological Sciences & Engineering’s expert advice and world class STEM career programs have helped grow great Australian technology and innovation.

Help us continue to provide evidence-based advice, celebrate excellence and equip Australians with STEM skills.

Donations to ATSE can help us:

- Support secondary school students to become aspiring scientists and technologists through hands on, enquiry-based learning.
- Pair industry leaders with PhD students to mentor them and help their careers thrive.
- Support women and diverse students to access undergraduate and postgraduate STEM scholarships at Australia’s leading universities.
- Guide more decision makers with robust, practical and evidence-based advice underpinned by science.
- Build international research-industry collaborations through grants and knowledge exchange workshops to address shared global issues.

**REGULAR GIVING**  
A regular contribution helps us plan for the future and supports the continuity of our expert advice and sustainability of our programs.

**ONLINE DONATIONS**  
The easiest way to donate is online using a credit or debit card via the ATSE website at [atse.org.au/donate](https://atse.org.au/donate)

You can reach the donation page by scanning this QR code



**DIRECT BANK TRANSFER**  
Name **ATSE**  
BSB **063000**  
Acc **00804125**  
Ref **Donor (Initial.Surname)**

Please email us so we can forward your receipt:  
[donations@atse.org.au](mailto:donations@atse.org.au)

**DONATIONS VIA PHONE**  
If you’d prefer to make your donation over the phone, please call 02 6185 3240.

**BEQUESTS**  
By considering the Academy in your will, you can make a lasting contribution to the Academy’s work. If you are considering a bequest, the Academy would be very pleased to discuss your plan. If you have already included the Academy in your will, we would appreciate the opportunity to say thank you. Please contact [donations@atse.org.au](mailto:donations@atse.org.au) with any questions or to request a confidential conversation.

**WE ARE A REGISTERED CHARITY**  
The Australian Academy of Technological Sciences & Engineering Limited is registered with the Australian Charities and Not-for-profits Commission and is listed by name as a Deductible Gift Recipient (DGR). It is covered by Item 1 of the table in section 30-15 of the Income Tax Assessment Act 1997.





CAETS<sup>2025</sup>

# Generations

An international symposium shaping  
a sustainable future in 50 years

**Don't forget to register for CAETS  
in Brisbane, 8–11 September 2025**



**CAETS**  
International Council of  
Academies of Engineering  
& Technological Sciences





Australian Academy of  
Technological Sciences  
& Engineering  
1975-2025

# 30 October 2025

## National Wine Centre, Adelaide

### ATSE New Fellows Showcase ATSE Awards 2025

ATSE New Fellows  
2025 Reception  
Wednesday 29 October  
Evening

ATSE New Fellows  
2025 Showcase  
Thursday 30 October  
Daytime

ATSE Awards 2025  
Gala Dinner  
Thursday 30 October  
Evening

**REGISTER**  
[atse.org.au/events](https://atse.org.au/events)