



ATSE

Australian Academy of
Technological Sciences
& Engineering

Annual review

2022–2023



The Australian Academy of Technological Sciences and Engineering (ATSE) Fellows live and work on Aboriginal and Torres Strait Islander lands and waters across Australia.

As we help Australians understand and use technology to solve complex problems, we remain mindful of the 60,000 years of science, technology and innovation represented by the world's oldest continuing cultures. We seek always to respect Aboriginal and Torres Strait Islander Elders, both from history and today, and to respect the deep knowledge embodied in their ancient and sustainable cultures and knowledge.

We acknowledge the Traditional Owners and pay respects to their Elders. We acknowledge Traditional Knowledge, and the deep history of innovation it embodies.

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ATSE is Australia's foremost impact network for leading applied scientists, technologists and engineers.

The Academy celebrates excellence in science, technology, engineering and mathematics (STEM) by appointing prestigious Fellows, awarding upcoming innovators and equipping the next generation with skills to build a better Australia and world.

We are an authoritative and independent voice to decision-makers, and our world-class STEM career programs are shaping the knowledge-makers and innovators we need to tackle our most urgent challenges – now and in the future.

VISION

A sustainable and prosperous Australia where applied science and technology protects our environment, builds resilience, nurtures a skilled workforce, grows competitive industries and enables all Australians to reach their greatest potential.

MISSION

We are a Learned Academy of independent experts helping Australians understand and use technology to solve complex problems.

WHAT WE DO

Inaugurated in 1976, ATSE was formed as a learned Fellowship of Australia's leading applied scientists, technologists and engineers and mobilised their expertise behind government and community priorities.

ATSE has since grown from 65 to almost 900 Fellows who are at the forefront of innovation in response to climate change and energy transitions, digital transformation, technologies to support national security, food security, personalised medicine, advanced manufacturing, and more.

We advocate for decisions, policies and planning based on the best available evidence, and work to support research and development (R&D) urgently needed to solve these issues. An independent, non-government organisation and registered charity, we also aim to grow a diverse and thriving STEM sector in Australia.

We do this by:

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Igniting curiosity and equipping students with systems thinking skills with our sustainability focused schools' program STELR in almost 1,000 schools in Australia.
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Partnering over 350 STEM PhD students and early-career researchers every year (Mentees) with hundreds of influential industry leaders from a broad range of sectors (Mentors) and offering internships through our IMNIS program. More than 1700 people have graduated and are putting their new skills and networks to work to grow Australia's collaborative R&D ecosystems.
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Supporting a broad diversity of women with scholarships, skills, networks and professional development to learn and thrive in their STEM careers through the Elevate: Boosting women in STEM program. With more than 1,000 applications in our first year, demand by Australian women for a career in STEM is strong.
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Unlocking access to international networks that boost Australia's global profile and partnerships in science and technology research and translation. Our programs build international research-industry collaborations through targeted grants and knowledge exchange workshops to address urgent global issues. We link Australian applied science and engineering leaders globally as a founding member of a global network of more than 30 learned academies in engineering and technology, and will host a major international symposium in 2025.

President's message



Dr Katherine Woodthorpe
AO FTSE FAICD
ATSE President

Against a backdrop of extreme weather and climate induced disasters; the peril and potential of artificial intelligence to transform how we live; and a national conversation of how we recognise and listen to Australia's first technologists and scientists – ATSE's work is more critical than ever.

In my first year as President of ATSE, I've been pleased to see our Academy's impact grow. With our almost 900 strong Fellowship working in collaboration with the ATSE Secretariat, our provision of evidence-based advice is guiding decision-making at Australia's highest levels.

We've advised extensively across the major government reviews underway – the Diversity in STEM Review, the Universities Accord, the National Science and Research Priorities and the Australian Research Council Reviews. Our major reports our STEM Skilled future, Curbing Antimicrobial Resistance (in partnership with CSIRO) and Generative AI have helped initiate the development of a national skills taxonomy, garnered national media attention, and guided a government review of AI regulation respectively. Our STEM Career programs have attracted over 1000 postgraduate and undergraduate applications from women and non-binary people in STEM, connected nearly 400 PhD mentees with industry mentors, and engaged over 900 schools. We've also named, famed and inducted 27 new Fellows and 9 ATSE Award recipients – as we endeavour to celebrate and collaborate with Australia's most incredible engineers and applied scientists. I have particularly enjoyed getting across most of the country to meet with our fellows, IMNIS mentors and mentees and Elevate Scholars. It's a privilege to listen, learn and lead this remarkable Academy with all of you.

Chief Executive Officer's message



Kylie Walker
ATSE Chief Executive Officer

As change becomes the new norm and opportunities grow for Australia in green energy, advanced manufacturing, and new digital technologies, engineering, applied science and technology has never been so crucial. It's been a pleasure this year to work with our expert Fellows to provide timely, relevant and impactful advice to decision-makers at all levels of government, industry and society – and to grow our programs' reach as we teach, inspire, and support the STEM-skilled workforce of tomorrow.

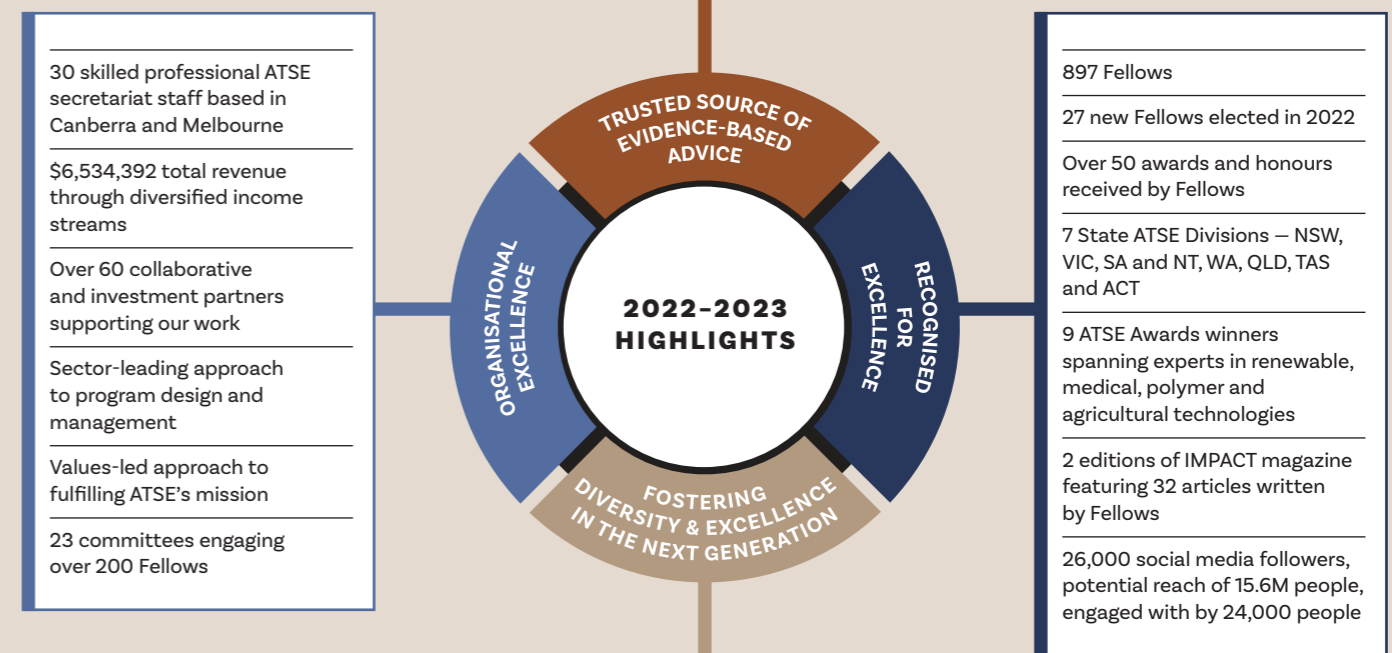
Thanks to the power and partnership of the Fellowship and Secretariat, ATSE's profile and influence is flourishing: we're sought-after by national leaders for advice based on robust evidence. Our Fellows have been eloquent advocates for growing the nation's skills, addressing workforce challenges, boosting investment and activity in research and development (R&D), and building social licence for transformative technologies.

Just a few highlights in an extraordinary year include 44 impactful submissions to guide parliamentary decisions – and 10 in-person briefings to Members and Senators and their staff; seven major research reports to guide next steps for investing in Australia's technologically-enabled and sustainable future; 48 scholarships awarded to women to study STEM at Australian universities; more than 3,000 news media mentions for ATSE and its work, including in major national media; 27 events bringing together nearly 2,000 people; and the launch of our Reconciliation Action Plan, including a new Traditional Knowledge Innovation Award.

As we continue to build capability, I look forward to our shared success in the year to come.

ATSE at a glance

44 submissions to guide parliamentary decisions	1 discussion paper
10 government reports released that mentioned or adopted recommendations	30 media releases resulting in 3011 media mentions, including stories in Australian Financial Review, Nature, ABC, Sydney Morning Herald and The Conversation.
4 parliamentary hearing appearances	7 published opinion pieces
6 briefings with parliaments	3 international workshops
7 major research reports	27 ATSE events bringing together nearly 2,000 people
19 ministerial and departmental advisory engagements	More than 230,000 unique website visitors in 2022/23
9 Policy Forums uniting 500+ experts from agriculture, digital technology, education, energy, health, industry and innovation, infrastructure, mineral resources and water	2 major press briefings



IMNIS

- 379 STEM PhD student mentees matched with hundreds of industry leader mentors
- 1736 alumni
- 20 catalysts empowered as ambassadors for STEM
- 17 high-level networking events

STELR

- 918 schools and 36 Community Education Centres (connecting four-plus schools each)
- 814 new hands-on science and engineering kits supplied to 98 schools and 4 Education centres in 2022-2023 within Australia
- 40 new schools have joined the STELR school network this year
- Online and live Shape Your Future STEM Career Webinars bringing leaders and young STEM professionals live to 50+ schools

ELEVATE

- 926 eligible applications
- 48 scholarships awarded to study at 18 Australian universities
- Elevate program launch at Parliament House with 2 Ministers
- 5 events and workshops

DIVERSITY IN STEM

- Reconciliation Action Plan launched
- Diversity and Inclusion Toolkit piloted with SMEs

Trusted source of evidence-based advice

Drawing on our expert network of Fellows, the Academy is a trusted adviser to industry, government, education, and society. We provide timely, proactive and solutions-focused advice on key challenges where technology, engineering and applied science have a role to play.

IMPACTFUL POLICY STATEMENTS AND SUBMISSIONS

Since the 2021 election, the Australian Government has undertaken a series of major reviews of the STEM sector. This has included: Diversity in STEM; the Universities Accord; National Science and Research Priorities; and the Australian Research Council (ARC) reviews.

In each of these reviews ATSE has contributed by providing expertise from our Fellowship in preparing submissions, attending roundtable discussions and private consultations, and inviting review leads to address the ATSE Board and Assembly. These reviews will shape the STEM landscape for years to come and ATSE Fellows have been key participants at every step of the process.

While final outcomes for most of these reviews are pending, much of ATSE's advice has been adopted in draft recommendations. This includes the ARC review, leading the Government to commit to ending the Ministerial Veto on research funding – an issue that ATSE and its Fellows have been vocal on as well as implementing a multistage approach to grant assessment to reduce the time wasted by researchers on applications.

ATSE's submissions in 2022-23 covered a broad range of topics drawing on the skills and expertise of our Fellowship, including tackling antimicrobial resistance, determining critical technologies, reducing emissions from the energy and infrastructure sectors, supporting the teaching workforce, and regulating against disinformation.

In FY 2022-23, outcomes were released for 11 inquiries to which ATSE had provided submissions. Of these, 10 either had strong alignment with ATSE's recommendations, or cited ATSE's input.

You can read all of ATSE's policy statements and submissions: atse.org.au/research-and-policy/publications

PROJECTS HELPING AUSTRALIA REALISE ITS TECHNOLOGICAL ADVANTAGE

Over the last year ATSE has delivered seven major reports, all under the expert guidance of our Fellowship. A selection of these reports, and their impacts, follows.



Our STEM skilled future – An education roadmap for an innovative workforce

The report was a cross-Forum project that brought together over 120 expert Fellows and invited guests at five STEM skills roundtables to create sector-specific and headline recommendations to address Australia's critical skills shortages. The report was launched at ATSE's ACTIVATE event on October 26 and has been the backbone of ATSE's education advocacy. As a result of this report ATSE has engaged with the Minister for Skills and Training, the Hon Brendan O'Connor MP in the development of a skills taxonomy, a project currently being completed by Jobs and Skills Australia. The report's recommendation for a central resource highlighting diverse STEM role models has been reflected in the draft outcomes of the Australian Government's Diversity in STEM review.

Curbing antimicrobial resistance: A technology-powered, human-driven approach to combatting the 'silent pandemic'

In partnership with the CSIRO and Australian Academy of Health and Medical Sciences (AAHMS), ATSE released a report exploring the technologies and strategies to fight the rising incidence of antimicrobial resistance (AMR). This report identified the key challenges and opportunities for Australia to improve prevention, detection, diagnosis, and response to drug-resistant infections and reduce the impacts of AMR. The release resulted in 500 media stories, reached an audience of 9 million people and key recommendations such as central coordination for antimicrobial resistance management have been implemented by the Federal Government.

Rapid Response Information Report: Generative AI

In response to the proliferation of generative AI, the Minister for Industry, Science and Resources Ed Husic, asked the National Science and Technology Council to provide a short, peer-reviewed report that explores this technology and international approaches to it. ATSE partnered with the Australian Council of Learned Academies (ACOLA), the Academy of Science, and the Academy of the Humanities to lead a comprehensive peer-reviewed report in less than two months with ATSE Fellows as lead and contributing authors. This work has been used to directly inform the government's proposed AI regulation framework which is currently under review.

Research translation and commercialisation report series

ATSE's series of deep-dive reports, in partnership with the Federal Department of Education, is exploring opportunities for commercialising existing research at Australian universities, to advise on applications for the Australian Economic Accelerator. Three reports were delivered through the year, exploring commercialisation of research in synthetic biology, electric vehicles and high-level priorities for the Economic Accelerator. These reports are also being used to inform development and implementation of a range of Government policies and programs relating to research translation and commercialisation in Australia, including: CSIRO's Main Sequence Ventures; Start-up Year loan program (SY-HELP); Industry-focused PhDs and fellowship programs; and Trailblazers Universities Program.



ADVOCACY TO SUPPORT EVIDENCE-BASED DECISION MAKING

ATSE's policy work underpins its proactive government advisory agenda. Advice put forward by ATSE was reflected in this year's Federal Budget. The Federal Government's clean energy initiatives, including funding schemes for household and social housing efficiency upgrades, and funding to scale up the renewable hydrogen industry, mirror recommendations made by ATSE in submissions to the 2022 National Energy Performance Strategy and the Green Energy Superpower consultations.

STRONG INTERNATIONAL CONNECTIONS

Global Connections Fund: Supporting international research-industry collaborations

ATSE facilitated successful international research-industry collaborations through the Australian Government-supported Global Connections Fund. This year, four grants were awarded to Australian researchers and small-medium enterprises (SMEs) to fund commercialisation activities with international partner organisations in national priority areas:

Australia-USA: Feasibility study for Buruli ulcer topical treatment

Australia-India: Recycling galvanised zinc ash into high-value additives to treat wastewater

Australia-UK-Pakistan: Wound care gel promoting vascularisation and pain relief

Australia-Vietnam: A smart system for monitoring and quality control of dragon fruit in Vietnam's cold freight trucks



Australia-Korea Techbridge workshop

ATSE led the delivery of the Australia-Korea TechBridge workshop (above) focusing on Cube Satellites (or CubeSats), which are miniature satellites offering a low cost means to deliver cargo into orbit. ATSE hosted Australian and Korean CubeSat experts from research and industry at a Sydney workshop to discuss satellite design, manufacturing and applications including research, data gathering, low earth observation, communications, and remote sensing.

Engaging on global challenges through CAETS annual conferences

In September 2022, ATSE joined 200 representatives from the global network of member academies of the International Council of Academies of Engineering and Technological Sciences (CAETS) for the 2022 annual conference in France. It was the first opportunity for member academies of this global network to meet in person since the COVID-19 pandemic. Coming together was invaluable for reconnecting on urgent global issues – climate change, sustainable development and how to support younger generations to engage in STEM. In a conference highlight, Dr Carrie Hillyard AM FTSE FAICD presented ATSE's technology readiness analysis for the healthcare sector at the CAETS2022 symposium focused on breakthrough technologies in healthcare.

ATSE is a founding member and Australia's representative in the CAETS network and will join the CAETS board in 2024 and host the 2025 annual conference in Australia.

EVENTS THAT INSPIRE AND INFORM

ATSE Forums and Divisions held 27 high-impact events bringing together 1300 people and covering issues ranging from quantum technologies, research translation, AI, sustainability and climate-smart farming.



ACTIVATE

In 2022 ATSE held our first multi-day event: ACTIVATE (pictured left) with the theme *A tech powered, human driven future*. The symposium featured 64 diverse speakers across two days, with three high profile international speakers including newly elected ATSE Foreign Fellow Professor Rajendra Paroda FTSE; Vice Chancellor of the University of the South Pacific Professor Pal Ahluwalia; and XPrize CEO, astronaut, entrepreneur and global change maker Dr Anousheh Ansari.

90% of the total event audience gave a satisfaction level of 4+ (5 being the highest)

Over 430 attendees from across the breadth of the STEM sector attended ACTIVATE with representatives from the education, technology, engineering and government sectors across both days.

MEDIA ADVOCACY

ATSE and our Fellows were mentioned in stories from a range of local, national, and international news organisations such as The Guardian, the ABC (and local ABC broadcasters), The Sydney Morning Herald, COSMOS Magazine, the Australian Financial Review, The Conversation, and many more.

3011 media mentions

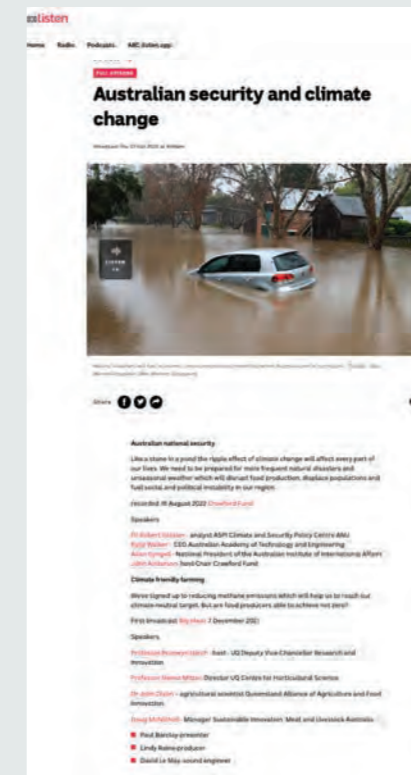
68 unsolicited Journalist requests for interviews from ATSE and its Fellows

The Antimicrobial Resistance Report Launch reached **9 million** people.



SOCIAL MEDIA AT A GLANCE

ATSE's #FellowFriday campaign shone a spotlight each week on one remarkable Fellow and celebrating their achievements and thought leadership. The campaign generated 1.16M social media reach.



Recognised for excellence

With excellence in applied science, engineering and technology at our core, the Academy attracts diverse and outstanding talent to its Fellowship and programs. Our Fellows are highly engaged, mobilised and professionally supported to proactively and positively contribute to achieving a sustainable and prosperous Australia.

ELECTING AND ATTRACTING AN OUTSTANDING DIVERSITY OF TALENT

New Fellows 2022



Dr Nicholas Austin FTSE
Chief Executive Officer, Watertrust Australia
Dr Austin is a hydrologist by training, bridging agriculture and engineering in the critical area of water.



Professor Madhu Bhaskaran FTSE
Co-leader, Functional Materials and Microsystems Research Group, RMIT University
Professor Bhaskaran is an engineer who has developed stretchable skin-like electronic devices for better health care.



Professor Michael Breadmore FTSE
Director, Australian Centre for Research on Separation Science, University of Tasmania
Professor Breadmore is an analytical chemist. His 'lab-on-a-chip' technology separates chemicals on miniature scale enabling users to get results on the spot.



Professor Kylie Catchpole FTSE
Deputy Director, School of Engineering, ANU
Professor Catchpole is a global expert in solar energy. Her pioneering work demonstrating new approaches to increase the efficiency of solar cells and solar hydrogen technology has shaped the field.



Professor Michelle Colgrave FTSE
Future Protein Mission Leader, CSIRO Agriculture and Food; Professor, Food and Agricultural Proteomics, Edith Cowan University
Professor Colgrave is internationally known for her cutting-edge work in proteomics used to improve agriculture and food for the benefit of human health.



Dr Elizabeth (Beth) Ebert FTSE
Senior Principal Research Scientist and Head, Forecast Quality Research, Bureau of Meteorology
Dr Ebert is a meteorologist with extensive experience working in governments. She holds a leadership role in the World Meteorological Organization and has had influence on international research in high impact weather.



Professor Katrina Falkner FTSE
Executive Dean, Faculty of Science, Engineering and Technology, University of Adelaide
Professor Falkner is a top 100 innovator completely transforming computer science education.



Professor Mary Foley AM FTSE
Special Adviser and Non-Executive Director, Telstra Health
Professor Foley has made an extensive contribution to health systems leadership and policy development in Australia.



Professor Maria Forsyth AM FTSE FAA
Chair in Electromaterials and Corrosion Science, Deakin University
Professor Forsyth has been at the forefront of global research and collaboration in energy storage for decades.



Dr Elizabeth (Beth) Fulton FTSE FAA
Senior Principal Research Scientist, CSIRO Oceans and Atmosphere
Dr Fulton is a trailblazer in the sustainable management of marine environments. Her whole-of-system modelling tools are considered world-best by the UN Food and Agricultural Organization.



Professor Xiaojing Hao FTSE
Professor, School of Photovoltaic and Renewable Energy Engineering, UNSW
Professor Hao is a world expert in solar technology and has helped establish Australia's global leadership in this field.



Janine Herzig FTSE
Executive President and Director, CEEC International
Janine Herzig is a metallurgical engineer with 30 years' experience in the resources sector, community relations, and environmental, social and governance.



Professor Mark Howden FTSE
Director, ANU Institute for Climate, Energy and Disaster Solutions
Professor Howden has been a member of an extraordinary 20 Intergovernmental Panel on Climate Change since 1991, sharing the 2007 Nobel Peace Prize with other IPCC participants and Al Gore.



Distinguished Professor Dietmar W. Hutmacher FTSE FAHMS
Chair in Regenerative Medicine, Queensland University of Technology; Co-Director, Max Planck Queensland Centre for the Materials Science of Extracellular Matrices
Distinguished Professor Hutmacher is a global leader in scaffold-guided tissue regeneration (SGBR).



PSM Professor and Scientia Professor Nasser Khalili FTSE
Head, School of Civil and Environmental Engineering, UNSW; Director, ARC Industry Transformation Research Hub for Resilient and Intelligent Infrastructure Systems
Professor Khalili is a leader in geotechnical engineering, computational geomechanics and unsaturated soil mechanics.



Professor Michael Milford FTSE
Joint Director, QUT Centre for Robotics; Australian Research Council Laureate Fellow, Queensland University of Technology
Professor Milford is a researcher in neuroscience-based robotics navigation working with industry and government to develop positioning systems for autonomous vehicles.



Professor Ann Nicholson FTSE
Dean, Faculty of Information Technology, Monash University
Professor Nicholson is a computer scientist specialising in artificial intelligence and a respected international expert in Bayesian networks.



Professor Thas Nirmalathas FTSE
Deputy Dean (Research), Faculty of Engineering and Information Technology, University of Melbourne
Professor Nirmalathas is an expert in communications technologies and networking for optical distribution of broadband wireless signals.



Kirsten Rose FTSE
Executive Director Future Industries, CSIRO
Kirsten Rose is a respected leader in technology and innovation with a career spanning 30 years in the US, UK and Australia.



Dr John (Jack) Steele FTSE
Director, Science Impact and Policy, CSIRO
Dr Steele has driven national initiatives to commercialise scientific research for decades. From 2015, he led the establishment of CSIRO's Main Sequence, an innovation fund commercialising 'deep technology' research.



Professor Brain Uy FTSE

Head, School of Civil Engineering, University of Sydney
Professor Uy is an international authority on steel and composite structures.



Richard White FTSE

Chief Executive Officer and Founder, WiseTech Global
Richard White founded WiseTech Global in 1994, growing it into a \$19 billion ASX listed company that is a leading global supplier of logistics execution software, servicing over 18,000 customers across 170 countries.



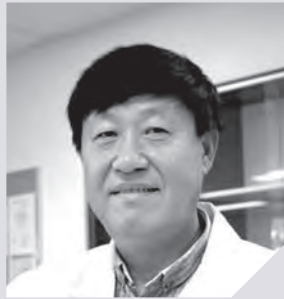
Merryn York FTSE

Executive General Manager System Design, Australian Energy Market Operator
Merryn York trained as an electrical engineer and has worked in the Australian energy sector for more than 30 years.



Professor Wei Zhang FTSE

Research Director, Marine Bioproducts Cooperative Research Centre; Founding Director, Centre for Marine Bioproducts Development, Flinders University
Professor Zhang is an inspiring leader in marine biorefinery and bioproduct development technologies, and he has passionately pursued a career driving translational research with industry impacts.



Professor Huijun Zhao FTSE FAA

Director, Centre for Catalysis and Clean Energy, Griffith University
Professor Zhao is an eminent researcher in sensing technology. He has developed innovative chemical, microbiological and nano-technological approaches to understanding pollutants in aquatic environments and soils.



Dr Rajendra Paroda FTSE

Chair, Trust for Advancement of Agricultural Sciences
Dr Paroda is an acclaimed agricultural scientist specialising in plant genetics and breeding. His contributions to plant breeding and genetic resource management are globally recognised and include establishing the first modern national genebank in India.



Professor the Hon. Kim Carr FTSE FAHA

Former Senator for Victoria
Professor the Honourable Kim Carr was a Senator for 29 years. A former tech-school teacher, he was drawn to politics by the transformational possibilities of science and education.

HONORARY FELLOW

FOREIGN FELLOW
Delhi, India

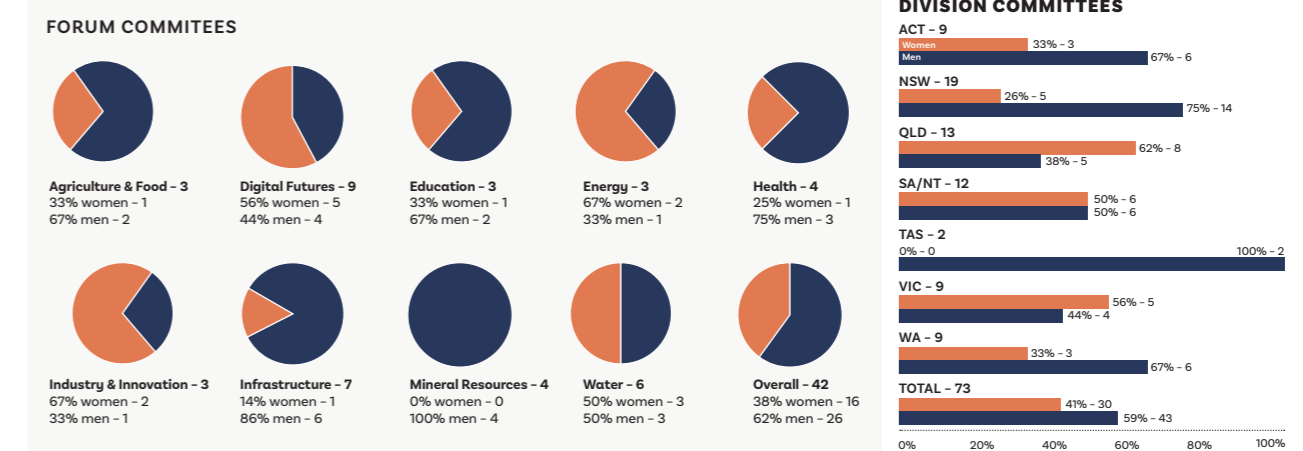
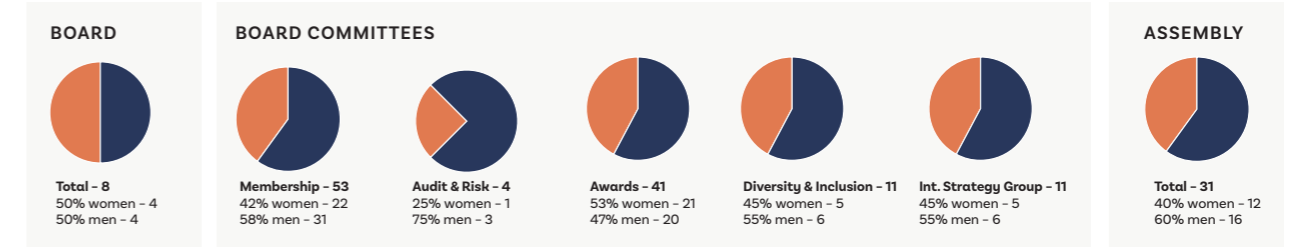
2022-2023

Diversity & Inclusion

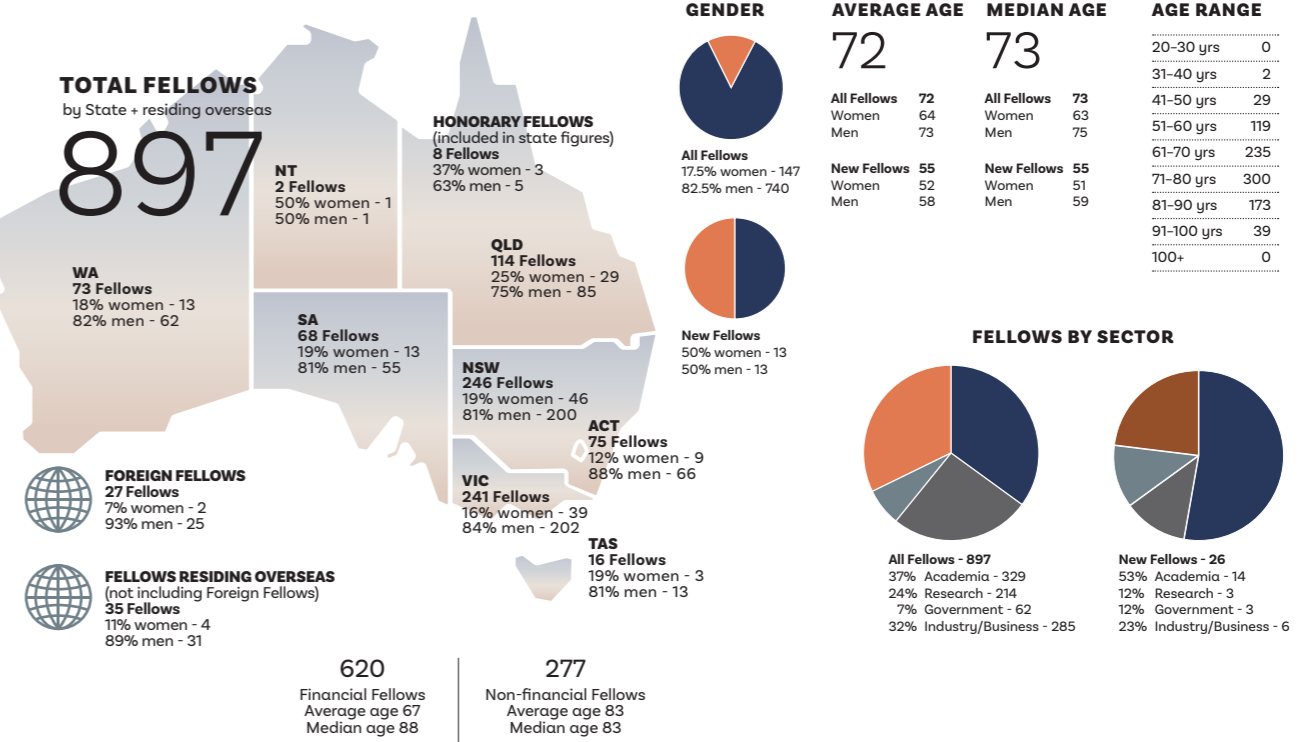


The Australian Academy of Technological Sciences and Engineering commits to working proactively for a more diverse and inclusive Academy and STEM sector.

ACADEMY GOVERNANCE & LEADERSHIP



FELLOWSHIP



PROACTIVE ENGAGEMENT WITH FELLOWS

In 2022/23, ATSE Fellows donated significant time across the breadth of the Academy's activities in many ways as outlined below. If Fellows' time on ATSE work was quantified in the same way as senior consultants, this work would be worth an estimated \$1.9 million this year. We are deeply grateful for their time, expertise, passion, and commitment.

A snapshot of how ATSE Fellows engage



Vale

The ATSE community was saddened to lose treasured friends and collaborators through the year. We recognise and remember the following late Fellows:

Dr William Blevin AM FAA FTSE died on 11 August, aged 93.
 Professor Anthony Bradshaw FTSE died on 24 October, aged 99.
 Percy Brett OBE FTSE died on 10 August, aged 98
 Dr Alex Buchanan FTSE died on 25 October, aged 88
 Dr Ian George Dewar Cameron AO FTSE died on 5 May, aged 93
 Em. Professor Christopher Fell AO FTSE died on 8 December, aged 82
 Thomas Brian Finn AO FTSE FAICD died on 18 April, aged 86
 Dr Adam Jostsons FTSE died September, aged 85
 The Hon John Kerin AO FTSE died on 29 March, aged 85
 Professor Robin King FTSE died on 25 July, aged 76

Professor John Lovering AO FAA FTSE died on 4 January, aged 93
 Dr Jim May FTSE, died on 6 June, aged 88
 Professor Adrian Mouritz FTSE died on 4 March, aged 60
 Dr John Nutt AM FTSE died on 23 April, aged 88
 Michael Poole AM FTSE died on 4 September, aged 80.
 Dr John Possingham AO FTSE died on 30 April, aged 94
 Dr Michael Sargent AM FTSE died on 27 August, aged 79
 Else Shepherd AM FTSE died on 20 February, aged 79
 Michael Taylor AO FTSE, died on 2 June, aged 75
 Dr William Allan Wulf FTSE died on 10 March, aged 84

ATSE Awards 2022

STRONGLY CONTESTED AND HIGH-PROFILE NATIONAL AWARDS



Professor Veena Sahajwalla FAA FTSE
Sustainable systems innovator
UNSW Sydney



Distinguished Professor Saeid Nahavandi FTSE
Haptic systems pioneer
Deakin University

ATSE's prestigious national awards recognise an outstanding suite of innovators and entrepreneurs, achieving across sectors and career levels in STEM.

CLUNIES ROSS INNOVATION AWARD

Professor Veena Sahajwalla FAA FTSE
Professor Sahajwalla is known globally for inventing a patented Polymer Injection Technology known as Green Steel™ where coke and coal are partially substituted with waste rubber tyres in electric arc furnace steel making, delivering a more environmental outcome and enhancing the steelmaking process.

CLUNIES ROSS ENTREPRENEUR OF THE YEAR AWARD

Distinguished Professor Saeid Nahavandi FTSE
Distinguished Professor Nahavandi is recognised internationally for his work on intelligent systems and simulation technologies, including haptics. Haptic technology creates an experience of touch by applying forces, vibrations, or motion to the user.



Professor Jason Monty and Dr Forbes McGain
COVID-19 healthcare game-changers
University of Melbourne and Western Health



Associate Professor Aaron McFadyen
Drone automation accelerator
Queensland University of Technology

CLUNIES ROSS KNOWLEDGE COMMERCIALISATION AWARD

Professor Jason Monty and Dr Forbes McGain
Associate Professor McGain is an intensive care physician and anaesthetist at Western Health. Professor Jason Monty is head of the University of Melbourne's Department of Mechanical Engineering and an expert on fluid dynamics. The Medihood (like a pram's rain hood) that can be placed over the head and torso of an infected COVID-19 patient to contain the virus particles and protects healthcare workers and nearby patients.

BATTERHAM MEDAL FOR ENGINEERING EXCELLENCE

Associate Professor Aaron McFadyen
Associate Professor McFadyen is an early career researcher who has developed air traffic management technology enabling the safe expansion of drone flight numbers over urban areas. The expansion of the drone market required change as the previous process for approving flights was manual and could take weeks.



Dr Zoë Doubleday
Seafood safeguard specialist
University of South Australia



Dr George Chen
Dairy industry innovator
University of Melbourne

ICM AGRIFOOD AWARD

Dr Zoë Doubleday
Dr Doubleday has used her combined expertise in marine ecology and geochemistry to develop a method to trace the provenance of seafood. Her aim is to help combat seafood fraud and illegal fishing; practices that threaten Australia's multi-billion-dollar seafood industry.

ICM AGRIFOOD AWARD

Dr George Chen
Dr Chen is a chemical engineer specialising in membrane technology and has led the development of breakthrough techniques enabling the dairy industry to reduce waste and energy usage while enhancing sustainability and turnover.



Jefferson Lam
Plant-to-panel solar engineer
Monash University



Associate Professor Laura Downie
Vision health innovator
University of Melbourne

EZIO RIZZARDO POLYMER SCHOLARSHIP

Jefferson Lam
Jefferson Lam is a PhD student engaged in developing the next generation of solar panels. Jefferson's vision of solar energy available at low cost inspired him to examine anew the solar energy harvesting systems of plants, developed over millennia.

DAVID AND VALERIE SOLOMON AWARD

Associate Professor Laura Downie
Associate Professor Downie is recognised internationally for her leadership in evidence-based vision care, particularly in the area of dry eye disease for which she has engaged with leading international bodies, including the World Health Organization.

ATSE PRESEIDENT'S AWARD

Dr Joanne Daly PSM FTSE
Dr Daly is the inaugural recipient in recognition of her extraordinary commitment and exceptional contribution to the Academy.



Dr Joanne Daly PSM FTSE
ATSE change champion

Fostering diversity and excellence in the next generation

To ensure Australia's future capacity to innovate and use technology, ATSE is committed to inspiring and fostering a diversity of young people to strive for excellence and pursue study and careers in engineering, applied science, and technology.



IMNIS

IMNIS (Industry Mentoring Network in STEM) is our award-winning industry engagement initiative, which annually pairs motivated PhD students and early career researchers (mentees) in STEM with influential industry leaders (mentors) in a one-year mentoring and professional development program. The program proactively builds a cross-sector collaboration culture. ATSE is extremely grateful to the IMNIS mentors who have donated their time and expertise equalling close to \$1 million this year.

17 PARTICIPATING ORGANISATIONS ACROSS FIVE STATES



IMNIS Engage
Industry mentoring, professional development and interdisciplinary, cross-sector networking. IMNIS now has 1736 alumni and counting.



IMNIS Catalyst
Our ambassador program for IMNIS Engage alumni. This year, we welcomed 20 catalysts as active ambassadors for STEM.



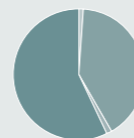
IMNIS Ignite
Our industry internship program bridges skill gaps in the sector by connecting highly skilled and motivated researchers with industry through 3- or 6-month internship opportunities. 376 mentees were paired with mentors this year



17 high-level networking events across Australia

20 catalysts were empowered as ambassadors for STEM

MENTEES



Gender
57% women
39% men
<1% gender fluid
3% prefer not to say



Career Aspirations
4% academia
13% unsure
32% industry
51% mobile between industry & academia

MENTORS



Gender
47% women
48% men
<1% gender fluid
4% prefer not to say



Sector
71% industry / private
17% academia / NFP
12% government

*Only 132 Mentors shared their gender

87% of Mentees have a better understanding of the broader STEM ecosystem and industry sector

99% of Mentees have a better understanding of the value of networking after completing the program

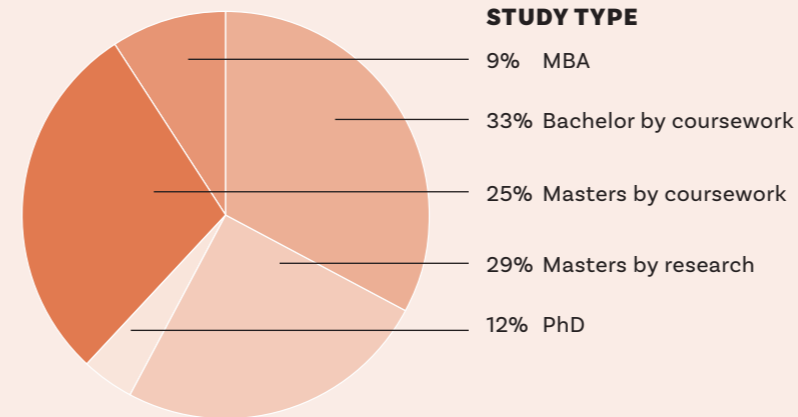
92% of Mentees said that they have a better understanding of career options in industry beyond academia

ELEVATE

ATSE's Elevate: Boosting Women in STEM program will award 500 undergraduate and postgraduate scholarships to women and non-binary people in STEM through the generous support of the Department of Industry, Science and Resources.

The Elevate Program aims to address gender inequities in STEM through fostering more women and non-binary led industry-academia collaborations in applied research and business, growing professional skills of women in STEM and propelling women and non-binary people into leadership. The Elevate program provides wrap around support to its scholars including the scholarship, access to events and networking, professional development, mentoring and ongoing support during the scholars' studies to support thriving STEM careers.

Since its inception, Elevate has established its position as a collaboratively designed, sector-leading program to support women in STEM, underpinned by robust processes, systems, and evidence-based approaches – and a strong commitment to continuous improvement. Elevate's collaborative partner organisations have engaged enthusiastically to support scholars with skills-building workshops, mentoring and by extending opportunities to participate in programs and workshops they deliver.



"I am really enjoying the opportunity to expand my skills, meet new people from interdisciplinary backgrounds and step into the world of research."

Elevate postgraduate scholar

48 scholarships awarded

18 universities across Australia

935 eligible applications (1025 submitted)



Elevate launch at Parliament House with Ministers Husic and Gallagher.



13 scholars have attracted additional funding to support their study, research or attend a conference, leveraging the Elevate investment

"Just by having a leadership scholarship, I've had a tool to leverage at work when it comes to participating in Women in STEM and leadership activities."

Elevate leadership scholar

98% of scholars felt well-supported by the team at ATSE

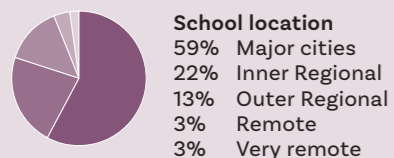
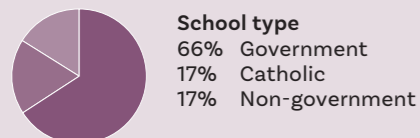
97% of scholars understand how enabling skills prepare them for their future

94% of scholars say they have already benefited from being part of the program

STELR

918 Schools Australia wide

36 Education centres



SUBSIDISED KITS FOR SCHOOLS

5 Schools that received donated or subsidised STELR kits

SCHOOL ICSEA* VALUE

420 schools have a value of 1000 or less

*ICSEA Index of Community Socio-educational Advantage is a scale of socioeducational advantage. 1,000 is the average score.

Science and Technology Education Leveraging Relevance (STELR) is ATSE's hands-on secondary school science education program. It's a national initiative which aims to boost student participation and achievement in STEM, in which teachers and students apply engineering principles to put the science curriculum into hands-on action, with a focus on environmental sustainability.

The STELR schools network has grown by 4.5% from previous year, now counting 918 schools and 36 Education centres within Australia.

Globally STELR now has a presence in 8 countries through 34 institutes utilising STELR kits which includes schools, educational centres and universities in New Zealand, Canada, India, Indonesia, Philippines, Singapore, Poland, and the USA.

Our live events at the Australian Synchrotron and at ATSE's ACTIVATE conference engaged hundreds of secondary students and teachers from 9 schools in Victoria and NSW.



SHAPE YOUR FUTURE STELR

The *Shape Your Future* webinar series brings young STEM professionals directly into classrooms, engaging over 50 schools this year. Recordings of all the *Shape Your Future* careers in STEM webinars can be found on ATSE's YouTube channel.



CS in Schools

With ATSE's help, the free, philanthropically funded digital education program CS in Schools has grown in profile and reach, and rapidly expanded the breadth of courses it offers to Australian secondary schools. The co-founders and ATSE's Board agreed that, to support its continued growth and success, the program should become an independent entity. The program is currently under an auspicing arrangement with ATSE to ensure the program can continue to be philanthropically funded and offered free to all schools. We are grateful to TDM Foundation, John and Myriam Wylie Foundation, the Howarth Foundation and Jasper Foundation for their generous support.

Reconciliation

RECONCILIATION ACTION PLAN



In Australia we are fortunate to live on the lands of the oldest living culture on earth. Indigenous Knowledge systems and traditions have existed in Australia for more than 65,000 thousand years – long before western science and technology.

This rich multi-generational experience has resulted in a deep knowledge, understanding, care and respect for the lands and waters of this country. This makes Aboriginal and Torres Strait Islander Peoples Australia's first scientists and technologists.

The sustainability and adaptability of Traditional Knowledge systems present a tremendous opportunity for deep engagement and cooperation between Traditional and new knowledge, particularly on issues that relate to our environment.

ATSE's vision for reconciliation is that all Australians recognise and value Aboriginal and Torres Strait Islander custodianship as one of the oldest knowledge systems on the planet. Through respectfully working with, listening to and learning from current Traditional Knowledge holders and practitioners in science and engineering, we will build a better nation and a healthier, more sustainable world.

ATSE's Reflect Reconciliation Action Plan hopes to provide a platform for empowerment and inclusion of Aboriginal and Torres Strait Islander People and voices in scientific and technological advice and decision making, and that this acts as a pathway to respectful, collaborative, and empowering application of Traditional Knowledge in the modern context.

ATSE launched its REFLECT Reconciliation Action Plan on Friday 5 May 2023, and opened applications for the inaugural Traditional Knowledge Innovation Award. As part of the Reconciliation Action Plan, ATSE has been considering Aboriginal and Torres Strait Islander perspectives, knowledge and impacts as part of its policy, projects, programs and other activities.



Above: On Friday 5 May ATSE hosted a launch event for the ATSE Reflect Reconciliation Action Plan.

Below: Detail from ATSE's Reconciliation Action Plan artwork: 'Knowledge Systems and Holders'. Artist: Lynnice Letty Church. Tribes: Ngunnawal, Wiradjuri and Kamilaroi (ACT and surrounding region / NSW)



Diversity

BUILDING A DIVERSE WORKFORCE FOR SMALL STEM BUSINESSES

ATSE's Diversity and Inclusion Toolkit was piloted by six small to medium STEM enterprises during 2022. These organisations ranged in size from a not-for-profit organisation with no paid employees to a small enterprise with 50 staff members. Feedback from all organisations was positive, and welcome suggestions on how to improve the Toolkit were provided.

In 2023 the Toolkit was reviewed by a representative from the National Indigenous Science, Technology, Engineering and Mathematic Professionals Network (NISTEMP), who also provided feedback on steps that could be taken to improve the Toolkit. This feedback and the pilot evaluation findings were integrated into an updated version of the toolkit, which will be launched in 2023.



Organisational excellence

ATSE Fellows work hand-in-hand with the ATSE Secretariat to achieve our mission to help Australians understand and use technology to solve complex problems. We work every day, and through our structures, policies and all activities, to apply our values of integrity and transparency, inclusion, collaboration, excellence and independence, sustainability and professional pride. ATSE strives to be an employer of choice and an attractor of outstanding talent to support our people-first approach to developing a high-performance culture.

FINANCIAL RESULTS

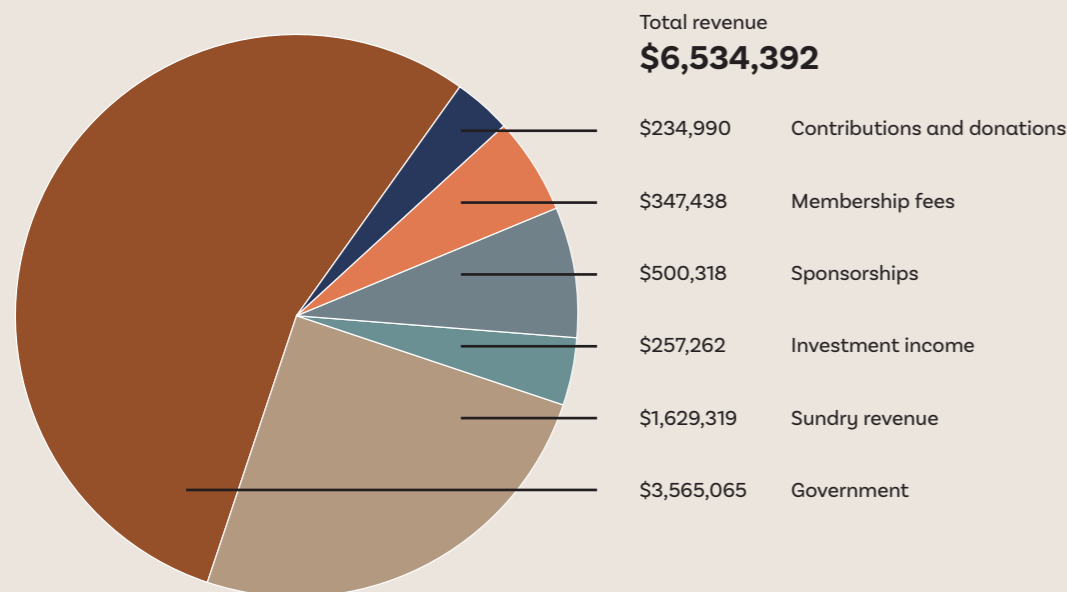
During the financial year the Board took several strategic decisions that impacted the financial results. Each decision was taken with full consideration of all implications, including financial, reputational, and operational: the impacts of each were as expected. The Academy also continued to update its systems and structures, and focus its attention to how its strategy, operations, budget and investment portfolio work in concert to deliver impact against the mission.

ATSE closed its Melbourne office in December 2022, as planned at the conclusion of the lease. ATSE's investments, like those around the world, have faced significant market volatility over the financial year. Careful oversight and management of these funds has resulted in strong financial returns and increase in capital value this year. The Board continued its strategy to maintain cash holdings and provided stability to the investment portfolio.

ATSE has consolidated its new organisational structure with recruitment focused on appropriate expertise to resource its strategic goals and activities, and ensure the continued provision of free, timely, best-available independent expert advice to Australian decision-makers.

The full financial report for the Financial Year ended June 30 2023 is available on the ATSE Fellows' website.

	2023	2022
Revenue	\$6,534,392	\$5,523,451
Expenses	(\$8,685,976)	(\$5,678,349)
Operational outcome for the year	(\$2,151,583)	(\$154,898)



ATSE is registered with the Australian Charities and Not-for-profits Commission and is listed by name as a Deductible Gift Recipient (DGR).

ACKNOWLEDGEMENT OF DONORS

The Academy acknowledges and expresses its gratitude to the following individuals, organisations and long-term supporters for their extraordinary generosity. Their donations support our Academy to acquit our important mission.

Orica Australia	Dr Carrie Hillyard AM FTSE FAICD	Dr John Williams FTSE
Richard Skinner	Dr Cathy Foley AO PSM FTSE FAA	Emeritus Professor John Agrew FTSE
Australian School Canteen Association	Dr Robert Watts FTSE FAA	Gary Zamel FTSE
Women in Super	Emeritus Professor Annabelle Duncan PSM FTSE	Joko Logis
Kylie Walker	ATSE Victorian Division	George Pizzey FTSE
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	Dr Gordon Frazer FTSE	Professor Vicki Sara AO FTSE FAA

We would also like to acknowledge all the generous donors past and present who wish to remain anonymous.

ACKNOWLEDGEMENT OF FELLOWS AND MENTORS

The volunteer hours invested by our highly engaged Fellows and other senior industry mentors who bring their expertise and guidance to the Academy and our work, are the cornerstone of ATSE. We thank each and every one of you for your contribution to delivering the Academy's mission.

ACKNOWLEDGEMENT OF STAFF

ATSE's Secretariat staff are committed, values-driven, and professional individuals who invest considerable time and energy into ensuring ATSE's work is highly professional, timely, aligned with our mission, and impactful. We're grateful to the team for a successful year.

MAJOR PARTNERS, SPONSORS AND COLLABORATORS

As a collaborative leader in Australian STEM, ATSE enjoys partnering with values-aligned organisations that recognise and value the critical role of helping Australians understand use technology to solve our greatest challenges.

ATSE is deeply grateful to our donors, sponsors and partners for their generous support and partnership, without which our evidence-based advice, reports, events, communication activities and STEM careers programs would not be possible.



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Wolfpack Space Hub

Women in Leadership Development
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Women in STEMM Australia

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