



# Annual Review 2016-17

INCORPORATING ABRIDGED  
AUDITED ACCOUNTS

AUSTRALIAN ACADEMY OF  
TECHNOLOGY AND ENGINEERING

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The Australian Academy of Technology and Engineering is the business name of the Australian Academy of Technological Sciences and Engineering (company name). The acronym ATSE is used for both.

#### **Annual Review 2016-17**

The full Audited Accounts of the Academy of Technological Sciences and Engineering for 2016-17 can be viewed on the ATSE website [www.atse.org.au](http://www.atse.org.au) and printed copies are available from the ATSE office (03) 9864 0900 or by email [lynn.pagoda@atse.org.au](mailto:lynn.pagoda@atse.org.au)

The full Audited Accounts of the Academy of Technological Sciences and Engineering for 2016-17 will be presented to the Annual General Meeting on 24 November 2017 at the Sofitel Sydney Wentworth Hotel, 61-101 Phillip Street, Sydney.

This Annual Review contains Abridged Audited Accounts of the Academy of Technological Sciences and Engineering for 2016-17.

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# Over the next 50 years, society will need to re-organise itself around technology.

Over the last 50 years we have seen immense technology progress. However, technology is still organised around society and I believe that over the next 50 years, society will need to re-organise itself around technology. As a result, technology will have a far reaching impact on everyone's lives. It is now more important than ever that ATSE be the trusted organisation that can drive the policy choices that will make Australia a global leader during this time of extraordinary transition.

ATSE is quite properly an organisation focused on technology invention. However, Australia only comprises 0.3 per cent of the world's population and even if we punch an order of magnitude above our weight, we are unlikely to produce more than 5 per cent of the world's invention. Where Australia can lead is by focusing on adoption of the global technology developments.

If we can show the benefits of technology adoption, and engage the community and business to embrace this disruption while preserving social cohesion our technology led future will be bright. As such ATSE delivered significant activities that promoted the importance of science and research translation for end use and innovation driven business as a pathway of prosperity for Australia.

We celebrated Australia's heroes of innovation and commercialisation through our highly regarded Clunies Ross Awards as well as recognised outstanding young Engineering innovators via the Batterham Medal.

It was a privilege to induct the 2016 New Fellows in November – an awe inspiring group of outstanding men and women. It is the ongoing annual 'injection of new blood' that is a key element of renewal for ATSE, ensuring we stay relevant and skilled at the cutting edge of technology and engineering developments. I am particularly proud of ATSE taking strong steps to ensure more women take up senior positions and are elected to the Academy.

This year was also a time to reflect on our history and achievements as ATSE turned 40 years young! In November 2016 we celebrated our 40th year by acknowledging our four surviving Foundation Fellows – John Christian, June Olley, David Solomon and Bill Whitton – and Greg Tegart, who has been a Fellow for 39 years. We also were able to acknowledge and honour the eight ATSE Presidents who preceded me – Sir Ian McLennan and Sir David Zeidler, both deceased, and Sir Rupert Myers, Sir Arvi Parbo, Tim Besley, John Zilman, Robin Batterham, Alan Finkel and Peter Gray.

We also held a successful ATSE National Technology Challenges Dialogue in June on health and the role of technology in improving care for the elderly and in reducing its cost. We had an array of talented speakers who covered topics ranging across the economics of ageing, digital health, genomics, intensive care, telecare, as well as the voice of the consumer. We followed the Dialogue with a half day workshop involving participants selected for their healthcare expertise, to identify the interventions that could be influential in improving the health system.

Given the immediate future faces technology change, globalisation and demographics that will pose a set of major opportunities and challenges for Australian business and society, ATSE needs to refocus its efforts to engage in determining technology solutions that benefit Australia.

This has seen ATSE spend the second half of this reporting year on a collaborative journey to establish a strategy pathway that will work to advance Australia's technology leadership to tackle issues such as climate change adaptation and mitigation and the social disruptive potential of automation and digital technologies.

I have the honour and privilege to lead the distinguished technologists and engineers that comprise ATSE and whose efforts mean the Academy is well equipped for the 21st century.

I wish to recognise and thank my Fellow Board members, the ATSE Assembly, Division and Forum Committees, the CEO and her talented staff and importantly all ATSE Fellows whose passion and talents were generously given to support ATSE in all its endeavors over the year.

**PROFESSOR HUGH BRADLOW FTSE**  
President



CEO'S REPORT

# Preparing for the future – making an impact. New strategy directions for 2017-2020.

ATSE is transitioning to a new stage as we review our performance over the past four years and move towards a focus on stronger impact in the balance of this decade.

The financial year saw the completion of ATSE's Strategy Plan 2013-2017 and the development process for our new Strategy direction for 2017-2020. So this was very much a year of noting our impact and effectiveness not only over the past 12 months, but in terms of achieving our strategic vision over the past four years.

Through the ongoing generous support and contributions of the Fellows, we have been able to deliver a high output of impactful research, policy advice, lectures and seminars on technology innovation topics with extensive stakeholder engagement.

Some highlights include:

- Successful staging of the Health Technology Dialogue: Crisis in Ageing which resulted in the publication of an ATSE position paper seeking enhanced efforts towards the adoption of electronic data systems between primary and secondary and home based care systems to enhance patient outcomes;
- Staging of the 2017 ATSE Innovation Dinner celebrating the three Clunies Ross Awards- The Entrepreneur of the Year , The Innovation Award and the Knowledge Commercialisation Award;
- Awarding of the Batterham Medal for outstanding young Engineering entrepreneur;
- Running the Global Connections Fund that promotes business-research engagement and awarded 40 Priming Grants (of \$7,000 each). ATSE also developed and awarded 15 Bridging Grants (up to \$50,000 each): a new bespoke program to promote early stage commercialisation (including prototype/ product development and/or market testing) with global partners.
- The STELR School STEM education program expanded by a further 76 schools nationally and regionally;
- National launch of our Industry Mentoring Network in STEM (IMNIS) mentoring program for 2nd year PHD students, providing

them with a 12-month engagement with a leading industry figure from the fields of medical technology and pharmaceuticals, Mining and services, and energy resources.

This year has seen a consolidation of a number of key policy and program areas led by ATSE over the past 3-5 years. Of particular note are research-industry engagement and impact measures; enhancing STEM (Science, Technology, Engineering and Mathematics) education in secondary schools; and ATSE leadership in addressing gender inequality in STEM.

It is pleasing that the ATSE research in measuring impact and engagement in university research triggered development of measure for impact and engagement assessment by the Australian Research Council. The new metrics will be a companion to the 2018 Excellence in Research for Australia exercise.

ATSE's STELR - Science and Technology Education Leveraging Relevance – Program is improving problem-based teaching and learning of STEM in years 6 to 10 in our secondary schools. STELR delivered equipment-based enquiry learning using real world context of sustainability and climate change to 87,500 students in 2016-17 and has engaged some 310,000 students over the past 5 years, with STELR schools now reporting increasing interest in senior science subjects.

ATSE Board has led on addressing gender equality in STEM based sectors through clearly articulating a Gender Equity Policy that promotes gender equity in STEM as a priority economic issue for Australia. We continued to increase the number of women elected as Fellows via our gender target of a minimum of 33 per cent

## CEO'S REPORT

each year. The 2017 ATSE Board comprised 55 per cent elected female Directors; and we delivered gender balance reflected in our Conferences and seminar speaker programs. ATSE also provides its Gender equity performance data on our website. Importantly, ATSE, in partnership with the Australian Academy of Science, operates the Science in Australia Gender Equity (SAGE) program. SAGE is a pilot of the successful UK Athena SWAN program in Australia, targeted at the Higher Education and publicly funded research sector that promotes policy and practices to achieve gender equity in the sector.

In 2017-18, the Academy will turn its attention to looking at how rapid changes in technology and innovation will shape our industries, our economy, our social fabric and environmental sustainability. A challenge that is vitally important for Australia's competitiveness and ongoing prosperity.

DR MARGARET HARTLEY FTSE  
Chief Executive Officer



## Comparative performance at a glance 2016-2017

	2015-16 outputs	2016-17 outputs
<b>EVIDENCE-BASED ADVICE AND ENGAGEMENT</b>		
Dialogue/Symposia/Seminars	4	4
Lectures	29	38
Technical reports/Publications	9	11
Workshops	9	6
Submissions/Hearings	20	26
Policy & NTC Statements	4	6
Ministerial/Parliamentary/Policy Briefs	16	24
ATSE-Stakeholders/Representation meetings	114	123
<b>COMMUNICATIONS</b>		
FOCUS editions	6	6
Newsletters	11	11
Enhanced web-based services	√√√	√√√
<b>INNOVATION &amp; RECOGNITION</b>		
Clunies Ross Awards	3	3
Batterham Award	1	1
<b>INTERNATIONAL ENGAGEMENT</b>		
International Meeting/Delegations	29	41
International Exchange Programs	4	4
Global Connections Fund Grants:		
Priming Grants	74	40
Bridging Grants	NA	14
<b>STEM SCHOOL EDUCATION</b>		
Australian Students engaged with STELR	73,900	87,500

NATIONAL CHALLENGES

# A key role of the Academy during the year was to address its seven National Challenges

These address a variety of issues seen as key to Australia's future – all resting on developing, accessing, assessing and using the best technology available.



*Panel members respond to questions during The Crisis in Ageing—Technology to Manage the Challenges in Healthcare Dialogue.*

## NATIONAL CHALLENGES



Ms Kathryn Fagg FTSE Addresses the Greater Collaboration – The Industry Challenge lunch in Sydney in 2016.

### 1. Maximise the contribution of technology to innovation, investment and productivity

The Industry and Innovation Forum published an Action Statement titled *New Business Opportunities for Research Collaboration* in November 2016. The Statement encourages businesses to take the lead in enhancing research translation and collaboration and was launched at the 2016 ATSE AGM.

The Forum held a joint luncheon seminar with the NSW Division in November 2016, entitled *Greater Collaboration – The Industry Challenge*. It addressed the changes needed in the Australian industry for greater collaboration between industry and research. Forum Deputy Chair Professor Ron Johnston FTSE facilitated the seminar, at which included Forum Chair Ms Kathryn Fagg FTSE spoke.

The Department of Industry, Innovation and Science (DIIS) commissioned ATSE to conduct a literature review and report on business-research collaboration in Australia. The final report, submitted in September 2016, examined research that had been undertaken, as well as policies and programs existing in Australia and beyond over the past 10 years. An in-depth synthesis of reports and policies was completed and a final report was prepared for the Department. Fellows Dr John Bell FTSE and Forum deputy chair Professor Thomas Spurling AM FTSE acted as advisers for the report.

The Department of Education and Training (DET) commissioned ATSE to undertake a national trial of the Research and Engagement Metrics developed as part of the Research Engagement for Australia (REA) project. The outcomes of this trial fed into the engagement and impact assessment exercise being undertaken by DET and the Australian Research Council (ARC), as part of the National Innovation and Science Agenda. All Australian universities agreed to participate in the trial, by providing access to data submitted to the ARC as part of the 2015 Excellence in Research for Australia (ERA) exercise, along with additional institution-held data. A report for the Department

was completed in 2016 and universities received their individual reports in late 2016.

In July 2016, ATSE made a submission to DET's consultation on new program guidelines for Research Block Grants for universities. The submission highlighted ATSE's support of the Research Block Grant arrangements, and made a number of recommendations, including measures to increased participation by Indigenous candidates in Higher Degree by Research training, supervision standards in the proposed Research Training Program Scholarship policy and ongoing measurement of research engagement.

The Minister for Industry, Innovation and Science invited ATSE to provide input into the new Statement of Expectations for CSIRO. ATSE's response was developed by a group of Fellows with experience on the CSIRO Board and ATSE Directors. The response highlighted the importance of CSIRO research in contributing to knowledge and having utility, enhancing the competitiveness of Australian industry and addressing key national challenges.

In March 2017, ATSE participated in consultations for the Review of the Code for the Responsible Conduct of Research. ATSE made a public submission to the Review and also provided written and verbal feedback to the draft Guide on Authorship. The Academy outlined its support of the new principles-based approach to the Code, as the simplified model provides greater clarity to institutions and researchers.

In May 2017, ATSE made a submission to Innovation and Science Australia's 2030 Strategic Plan Issues Paper. The submission outlined Australia's need for measures to incentivise innovation in the business sector, including through collaboration with researchers and other businesses.

### 2. Advance technological solutions for a healthy Australia

The Health Technology Forum held a seminar during ATSE's 2016 AGM titled *Personalised Healthcare: The Patient Will See You Now*. Professor Karen Reynolds FTSE, Health Technology Forum Chair, provided an introduction on how Australia's healthcare system was undergoing a major transformation. A series of presentations was followed by a panel discussion on the major opportunities and challenges for consumers, industry and government in participatory and personalised health cares.

The 2017 ATSE National Technology Challenges Dialogue *The Crisis in Ageing–Technology to Manage the Challenges in Healthcare* was held in Brisbane in June 2017. The Dialogue explored the challenges that underpin an ageing population and encouraged discussion between participants on the key issues of Australia's healthcare system.

A half day, invitation-only workshop followed the Dialogue and discussed the key themes from the Dialogue. ATSE then published an Action Statement titled *The Role of Technology in Active Ageing*, which highlighted the key messages from the Dialogue and provided a set of actions for improving the healthcare system.

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## NATIONAL CHALLENGES

ATSE stressed the need for Australia to embrace digital health technologies and focus on data integration and standardisation. The Statement illustrated central challenges, including community lack of trust, lack of data integration, regulatory barriers and issues with the development and uptake of technologies by the sector.

ATSE made a submission to Queensland Government's *Biomedical and Life Sciences 10-Year Roadmap* in August 2016. This outlined ATSE's support for the Roadmap, and suggested mechanisms for increased funding and collaboration.

### 3. Australia's transition to economic, low environmental impact energy supply and use

The ATSE Energy Forum (chaired by Dr Bruce Godfrey FTSE with Professor Dong-ke Zhang FTSE and Dr John Söderbaum FTSE as deputy chairs) continued its efforts to encourage an efficient and effective energy transition for Australia in the 2016-17 financial year.

The Energy Forum published an Action Statement, *Deep Reductions in Emissions Using CCS*, in June 2017 and called on the Federal Government to make some important decisions about the role of the technology in Australia.

The South Australian power blackout in September 2016 created an intense focus on the security of Australia's power systems. ATSE developed written submissions to a number of relevant inquiries and reviews, including the *Independent Review into the Future Security of the National Electricity Market* (March 2017). Dr Alan Finkel AO FAA FTSE chaired the review panel, which also featured ATSE Fellows, Ms Chloe Munro FTSE and Professor Mary O'Kane AC FTSE. The Forum also developed submissions to the Standing Committee on the Senate Select Committee into the *Resilience of Electricity Infrastructure in a Warming World* (February 2017), the Environment and Energy *Inquiry into Modernising Australia's Electricity Grid* (March 2017), and the Joint Standing Committee on Treaties *Generation IV*

*Energy generation and distribution is a key national issue.*







*Managing our water resources is a key national issue.*

**Nuclear Energy – Accession Inquiry** (March 2017). In September 2016, ATSE also successfully advocated to preserve ARENA's critical role, supporting early stage research and development in the renewable energy industry.

ATSE also continued contributing to the national discussions surrounding Australia's role in the nuclear fuel cycle. In April 2017, ATSE helped to organise a symposium at the Australian National University to review the report of the South Australian Nuclear Fuel Cycle Royal Commission.

In 2016, the Australian Council of Learned Academies (ACOLA) contracted ATSE to undertake a project scoping study and a research report identifying industry and research opportunities and challenges posed by energy storage technologies for an *ACOLA Horizon Scanning Project on Energy Storage*, chaired by Dr Bruce Godfrey FTSE. ATSE's report was delivered to ACOLA in March 2017.

#### 4. Efficient and sustainable resource management

##### WATER RESOURCES

The ATSE Water Forum (chaired by Dr John Williams FTSE, with The Hon Karlene Maywald FTSE and Professor Craig Simmons FTSE as deputy chairs) continued its efforts to encourage national water reform. The Forum developed robust submissions to the Standing Committee on Agriculture and Water Resources' *Inquiry into Water Use Efficiency in Australian Agriculture* (March 2017) and the Productivity Commission's *National Water Reform Inquiry Issues Paper* (April 2017).

##### MINERAL RESOURCES

The ATSE Mineral Resources Forum (chaired by Ms Denise Goldsworthy FTSE, with Dr Paul Zulli FTSE and Professor Jocelyn McPhie FTSE as deputy chairs) progressed the development of three Action Statements targeting the key challenges of productivity, exploration and sustainability in the mineral resources sector. The Mineral Resources Forum completed and published the first Action Statement, *Improving*

## NATIONAL CHALLENGES

*Productivity in the Mineral Resources Sector*, in November 2016. The Forum launched the statement by hosting a seminar featuring speakers from METS Ignited, Sandfire Resources and CSIRO at the 2016 ATSE Annual General Meeting. The Action Statements on sustainability and exploration were commenced in the 2016-17 financial year are both expected to be completed in late 2017.

ATSE is the Australian partner in the European Union project *International Raw Materials Cooperation (INTRAW)*, which aims to characterise the contextual environment of five reference countries (Australia, Canada, Japan, South Africa and the United States) in relation to raw materials. ATSE's Executive Manager Policy and Projects, Dr Matt Wenham, represented ATSE at two international meetings of the consortium partners and panels of experts for the project during the year. INTRAW published three major reports in November 2016, analysing Research and Innovation, Industry and Trade, and Education and Outreach in Australia. The INTRAW project will conclude in 2018 with the launch of the International Raw Materials Observatory, of which ATSE will be a founding member.

### CLIMATE CHANGE

ATSE continued to engage in the national debate about Australia's climate change and emissions reduction policies. This issue cuts across all ATSE National Technology Challenges and their associated Forums, not least the Natural Resources, Energy, Agriculture and Infrastructure Forums. ATSE's submission to the Australian Government Review *Australia's Climate Change Policies* in May 2017 provided a concise overview of the relevant recommendations from ATSE's previous research and policy statements. ATSE also began the development of a Position Statement on climate change mitigation and adaptation in the 2016-17 financial year.

### 5. Improved agricultural productivity, quality and sustainability

A summary of the 2016 National Technology Challenges Dialogue *Agribusiness 2030* outcomes was produced in the first half of the 2016-2017 period. This guided much of the work undertaken in that period, with a particular focus on gene technology.

ATSE made a joint submission with the Australian Academy of Science to the Office of the Gene Technology Regulator's Discussion Paper: *Options for Regulating New Technologies*. The focused on support for the exclusion of certain new technologies from regulation, on the basis of the outcomes they produced, and that regulations must be proportional to risk. The submission recommended a definition of 'foreign' nucleic acid, along with a nuanced approach to regulations in relation to gene drives and RNA interference, given their higher levels of uncertainty.

Work commenced during the year to establish the ICM Agrifood Award, which will be awarded at the 2017 ATSE Oration Dinner, to two of Australia's most innovative young food and agriculture professionals, both male and female. In addition, work commenced to prepare for ATSE's partnership with the Chinese Academy of

## NATIONAL CHALLENGES

Engineering to host a workshop on food safety in November 2017.

The Agriculture Forum is chaired by Professor Tim Reeves FTSE, with Dr Mary Ann Augustin FTSE and Professor Snow Barlow FTSE as deputy chairs.

### 6. Infrastructure to meet Australia's future economic and social needs

In December 2016, ATSE held a roundtable for senior leaders involved in urban planning and infrastructure to discuss the key findings of the ACOLA Securing Australia's Future Project 08, *Delivering sustainable urban mobility*. The aim of the roundtable was to action items emerging from the report that could be implemented to progress Australian cities towards sustainable urban mobility.

The event was held in Sydney and invited guests and speakers included the Assistant Minister for Cities and Digital Transformation, Angus Taylor, and the Social Commissioner for the Greater Sydney

Commission, Heather Nesbitt.

The Forum published its Action Statement *A new approach to long-term infrastructure planning and decision making* in November 2016. This highlighted the need for Australia to plan infrastructure based on how it envisions the future, not on how it understands the present. It was launched at the 2016 ATSE AGM, as well as at the SAF08 Roundtable.

In March 2017, ATSE made a submission to the House of Representatives Standing Committee on Industry, Innovation, Science and Resources Inquiry into the *Social Issues Relating to Land-based Driverless Vehicles in Australia*. ATSE suggested there were compelling benefits to full automation of Australia's road system and that it was vital that Australia's policies and infrastructure anticipate the exponential rate of technological advancement and uptake. ATSE President Professor Hugh Bradlow FTSE and Dr Matt Wenham represented ATSE at a public hearing of the inquiry in April 2017.

*The contrast of the natural curiosity and creativity of young children with the long-term decline in senior secondary school science enrolments was highlighted, particularly in physics and the more advanced levels of mathematics.*



*Students ponder issues raised by STELR's sustainable housing equipment.*

## NATIONAL CHALLENGES

ATSE prepared a brief submission to the VicRoads Future Directions Paper for driverless vehicles in February 2017. This drew on its submission to the 2016 National Transport Commission's (NTC) issues paper on *Regulatory Options for Automated Vehicles*, which addressed similar topics. It said ATSE strongly supported enabling on-road trials of automated vehicles across Australia more broadly and believed the introduction of autonomous vehicles on Victorian roads would result in a wide range of economic, safety and infrastructure benefits – and that it was important that the State fully encouraged and embraced the development of the technology.

The Expert Working Group for the National Infrastructure Roadmap released a draft Roadmap in December 2016. ATSE submitted a brief response to the draft, strongly supporting the inclusion of digital data and eResearch platforms as a Focus Area. ATSE also recommended the inclusion of two additional focus areas – research on civil infrastructure, and large-scale demonstration and validation of novel industry-ready technologies, particularly relating to engineering science.

### 7. Improve quality and reach of science, technology, engineering and mathematics (STEM) education at all levels

Continuing work completed in 2015-2016, the Education Forum (chaired by Professor Doreen Thomas FTSE, with Professors Ian Cameron FTSE and Barry Fraser FTSE as deputies), collaborated with both the ACT and NSW Divisions to consider the impact that low numbers of students undertaking STEM-based degrees may have on Australia's future economic prosperity and human and environmental health.

The Education Forum convened a one-day workshop in Sydney, focused on exploring three key questions:

- How can educators inspire creativity through the STEM curriculum?
- What professional skills do STEM graduates need to enhance their creativity?
- How can engaging diversity improve creativity in STEM?

The event emphasised higher education in STEM and drew an 80-strong audience comprised of representatives from academia, government and industry. Presentations and discussions at the workshop explored the role of future graduates in the STEM disciplines, noting that STEM graduates would have to be better prepared for social interactions. It heard that automation and AI would take over many tasks currently performed by individuals – thus STEM graduates' emotional intelligence (EQ) would be more important than their IQ.

The contrast of the natural curiosity and creativity of young children with the long-term decline in senior secondary school science enrolments was highlighted, particularly in physics and the more advanced levels of mathematics. Discussion reinforced the importance of nurturing STEM students' creativity through active learning methods with interdisciplinary dimensions and a need for education to be transformational to satisfy students' wish to both 'change the world' and gain personal rewards.



*Professor Kaye Basford FTSE and Professor Max Lu AO FTSE at the CAETS meeting in London in 2016.*

Myths were dispelled about 'creativity' being confined to a few people (the arts) and being 'unteachable'. It was highlighted that a combination of domain skills, communication skills and transdisciplinary skills will be essential for graduates to tackle the future of unknown jobs and wicked problems. Diversity in STEM, bringing new perspectives, together with a culture change will lead to greater creativity. Unconscious bias must be overcome so that targets and quotas for diversity are met as the current selection of traditional stereotypes leads to a misalignment with the changing nature of work.

ATSE made a supplementary submission to the House of Representatives Standing Committee on Education and Employment Inquiry into *Innovation and Creativity: Workforce for the New Economy*, following an earlier submission prior to the 2016 Federal election.

### International Programs

ATSE's international programs focused on key partner countries and were aligned with the Academy's seven National Technology Challenges. The programs continued to be underpinned by strong relations with sister academies, international scientific and research bodies and Government ministries nationally and internationally.

Key programs included:

- Exchange programs, involving universities, research institutes and industry;
- Joint workshops and delegations to exchange technical information and identify new collaborative opportunities; and
- Grant programs to foster international researcher-to-industry engagement.

ATSE is an active member of the International Council of Academies of Engineering and Technological Sciences (CAETS), an independent organisation of 26 engineering and applied science academies from around the world. ATSE's participation at the CAETS annual meeting (London, September 2016) and in CAETS projects support its links to influential Academies and their Fellows and effectively facilitates the ongoing development of international networks and access to new opportunities.

Key international programs and initiatives included:

## NATIONAL CHALLENGES

### GLOBAL CONNECTIONS FUND

ATSE administers the Global Connections Fund on behalf of DIIS. As part of the Government's National Innovation and Science Agenda (NISA), the Fund provides grants to support Australian researchers and SMEs collaborate in the global arena to explore and develop collaborative projects in global markets. It has two elements: Priming Grants and Bridging Grants. Following on from the 73 Priming Grants awarded in early 2016, 40 further Priming Grants were awarded in the second grant round in May 2017. In a highly competitive process, 14 Bridging Grants were announced in November 2016. The program will continue until 2020.

### CHINA: YOUNG SCIENTISTS EXCHANGE PROGRAM

ATSE operates the Australia China Young Scientists Exchange Program (YSEP) on behalf of the DIIS, which saw 16 Chinese scientists visited Australia in July-August 2016 and 16 Australian scientists visited China in October-November 2016. The selected researchers undertook a two-week program of visits to establish and develop strong individual and institutional collaborative linkages, with each researcher having an individually tailored program which reflect his/her research interests. ATSE has been contracted to run the program through 2018.

### CHINA: NEXT STEP INITIATIVE 2016

ATSE again ran a 'Next Step Initiative' in 2016 to fund follow-up activities to progress S&T collaborative initiatives arising from the 2015 YSEP placements. A competitive process resulted in the selection of five researchers who had participated in the 2015 program to progress their China collaborations.

### INDIA: JOINT INAE-ATSE WATER WORKSHOP

The Indian National Academy of Engineering and ATSE ran a three-day *Sustainable Urban Water Management Workshop* in Jodhpur, India, March 2017. Professor Tony Wong FTSE led the eight-member ATSE delegation. The workshop was an excellent opportunity to showcase Australia urban water management technology and expertise and to build links for ongoing cooperation with Indian counterparts. The Australia India Strategic Research Fund provided funding to support the Workshop.

### JAPAN: AUSTRALIA JAPAN EMERGING RESEARCH LEADERS EXCHANGE PROGRAM

The Australia Japan Emerging Research Leaders Exchange Program (AJERLEP) commenced in 2010 with funding support from the Japanese and Australian Governments. It is administered by the Engineering Academy of Japan (EAJ) and ATSE. In alternate years, selected Australian and Japanese researchers undertake a two-week program of research visits to establish and develop individual and institutional research linkages. In November-December 2016, eight Australian researchers visited Japan to undertake their two week tailored visit program. The four nominated research focus areas, jointly agreed by Japan and Australia as research priorities for both countries, were:

- Emerging Power Systems;
- Healthy Ageing and Wellbeing;

- ICT; and
- New Materials.

### KOREA: DIGITAL TRANSFORMATION WORKSHOP

Following the ATSE delegation to the Republic of Korea in March 2016 for a workshop and associated site visits under the Korea Australia Science and Innovation Connect (KASIC) program, the second element of the KASIC program, a workshop and site visits focusing on Digital Transformation, took place in Adelaide in April 2017.

The theme was *Digital Transformation* with a focus on Transport of the Future, Energy Networks and Smart Cities. Six Korean experts attended the workshop, including the International Director of ATSE's sister academy, the National Academy of Engineering Korea (NAEK).

### APEC ACTIVITIES

On the invitation from the Australian Government, ATSE participated in APEC activities under the auspices of the Policy Partnership on Science, Technology, and Innovation (PPSTI) program in Hanoi, Vietnam in May 2016. Dr Rosalind Dubs FTSE represented ATSE at the Women in STEM Working Group of the PPSTI and Dr Matt Wenham attended the plenary PPSTI meeting. Further interaction with APEC and the multiple countries involved is envisaged.

### RSNZ – 150TH ANNIVERSARY

Professor Hugh Bradlow FTSE and Dr Matt Wenham represented ATSE at the official launch of the 150th anniversary celebrations of the Royal Society Te Aparangi (New Zealand) in Wellington, as well as a one-day symposium on the role of Academies in providing science advice in Auckland in April 2017.

### GERMANY: JOINT POLICY DEVELOPMENT

ATSE and acatech (the German Academy of Science and Engineering) collaborated on a policy brief on Future Energy Systems for the 2017 G20 meeting held in Hamburg, as part of an initiative to establish an international monitoring process for the transition of energy systems.

### EUROPE DELEGATION, APRIL 2017

Professor Hugh Bradlow FTSE participated in an Australian Government innovation delegation to Germany, Switzerland and France in April 2017. The delegation comprised leaders from Australia's Industry Growth Centres and other peak bodies supporting innovation and science in Australia. The delegation aimed to:

- Study the national, regional and local strategies that have underpinned success in research and innovation;
- Share ideas and learn from examples of commercial innovation success, including through the formation of clusters; and
- Identify potential collaborations and partnerships in research and innovation between Australian organisations and organisations within these three partner countries.

The delegates met with industry research organisations, government officials and industry in a series of workshops, site visits and events.

## Communications Impact Assessment

ATSE undertook a Communications Impact Assessment throughout the 2016-2017 period.

Consultants Newgate Research were engaged to assist ATSE to develop a baseline measure of its impact, via a stakeholder poll, in-depth interviews and survey of all Fellows.

ATSE sent the stakeholder poll to 6000 stakeholders throughout February 2017. With 1,428 responses across academia, industry, government, and international, the results provided a high-level perception of the impact ATSE has on key stakeholders and informed the approach to the 31 in-depth interviews conducted with senior stakeholders from all sectors, with the majority completed within the 2016-2017 period.

Initial findings from the report suggest that ATSE is highly regarded amongst the stakeholders interviewed and enjoys a healthy reputation.

Key factors contributing to the reputation are:

- **Playing a unique and important role in Australia by bridging the gap between industry and academia;**
- **Providing thought leadership, advice and high quality reporting on issues of national importance;**
- **Vocal and visible – for some stakeholders, ATSE has a strong presence both at a political level and in the media;**
- **High calibre of its Fellows, which was thought to have engendered greater respect for ATSE's agenda;**
- **STELR, mentoring and international programs, with particular impact on creating the next generation of scientists; and**
- **The quality of its events: seen to be well-run, highly regarded and well attended by 'heavy hitters'.**

Factors detracting from ATSE's reputation included:

- **Low awareness and visibility of the brand and sector, especially (but not only) for the general public and need to raise profile;**
- **Lack of consistent and in-depth understanding of exactly what ATSE is and what it does;**
- **Some felt ATSE should engage more regularly with government, and be more of a proactive, trusted information source; and**
- **An older, 'academic' profile – stakeholders suggested ATSE must be more dynamic and relevant to provide impactful outcomes.**

In March and April, ATSE undertook to survey Fellows' perceptions of ATSE communications, outreach and impact. Key insights from the survey include:

**Impact and value** - The ATSE activities perceived to deliver the highest value (to Fellows) were *Focus Magazine*, the monthly Fellows' newsletter, Forum media bulletins and major projects/submissions to reviews. This was also reflected in the activities considered to have the highest impact (externally), with major projects and reports/submissions to reviews and STELR rating highly. The gender breakdown (on the activities of impact) highlighted differences –



*Dr Matt Wenham ATSE at the APEC meeting of the PPSTI (Policy Partnerships in Science Technology and Engineering) in Ha Noi Vietnam.*

women Fellows rated the gender equity initiative highest, where the men rated Focus highest.

**Reputation** – More than 30 per cent of ATSE Fellows consider ATSE to have a relatively strong reputation, with slightly less impact in influencing policy and industry.

**Active engagement** – The most popular Fellow involvement with ATSE activities, represented as more than once in the last 12 months, was reading *Focus* magazine, the monthly newsletters and reading Forum media bulletins. The activities with the least amount of involvement by Fellows included judging or assessing applications for awards, the Global Connections Fund, or serving on membership committees.

**Stakeholders** – Other than Fellows, the top stakeholders considered by Fellows to be the most relevant to ATSE were industry and government (public servants and politicians). The least relevant stakeholder was the public.

**The role of Divisions and Forums** – The primary role of Divisions was considered to be for Fellow social gatherings, with stakeholder engagement rated lowest, while the primary role of Forums was considered to be information sharing, with developing ATSE's strategic direction on topic areas rated lowest.

**STELR** – The overwhelming majority of Fellows considered that ATSE should expand its STEM programs to primary schools. Women and those Fellows working more hours were more likely to think that STELR should be focused on regional schools or low socio-economic schools.

**Gender Equity** – The majority of Fellows strongly agreed that ATSE should champion diversity, particularly gender equity within ATSE and across STEM, as well as to lead and invest in STELR, to ensure it achieves greater diversity for groups strongly represented in the Australian STEM workforce.

## Strategy Plan 2017-2020

The results of the Communications Impact Assessment were used by the Board, the Assembly and the ATSE Office in preparing the new Strategy Plan for 2017-2020.

MAJOR PROGRAMS

# Helping to ready secondary and tertiary students for the real world through STELR and IMNIS

*Victorian Small Business, Innovation and Trade Minister Philip Dalidakis tells the launch of the Victorian program how mentoring helped his career.*



## MAJOR PROGRAMS

Two major programs backed by the Academy moved strongly during the year to achieve results in areas of importance to Australia's future. The STELR Program (Science and Technology Education Leveraging Relevance) uses inquiry-based, hand-on learning techniques to capture and retain the interest in STEM subjects (Science, Technology, Engineering and Maths) of secondary students. It aims to make STEM subjects and careers more interesting and appealing to students – both during their school years and as they consider tertiary studies and subsequent careers. The IMNIS Program (Industry Mentoring Network in STEM) links PhD students in STEM courses with experienced mentors to broaden their understanding of business and entrepreneurial thinking and better equip them for their careers.

## STELR

During the year STELR added 75 new secondary schools to its total, taking the number of STELR schools (those using STELR equipment) to 604 across the country – more than 23 per cent of the nation's 2,573 secondary schools – continuing the strong growth (63 schools) achieved in the previous year.

The biggest growth was in NSW, where the number of STELR schools rose from 132 to 176 over the year.

- As part of promoting STELR in schools, ATSE's STELR staff were involved in a variety of initiatives during the year:
- Conducting 27 teacher professional learning workshops for 315 teachers across all states and territories;
- Producing seven STELR newsletters, sent to more than 2,500 subscribers, with subscriber numbers reaching 2,700.
- Presenting papers, conducting hands-on workshops and staffing displays at 14 education-based conferences in Australia and one in New Zealand.
- Promoting the programs as part of the Federal Governments STAR Portal, with six programs currently listed on this interactive and searchable database.
- Producing 20 videos for the STELR YouTube channel and Australia's Science Channel to promote STELR and show students and teachers how to use equipment items.
- Assisting 10 STELR schools obtain and use reusable model solar car kits – provided each year by the Australian Power Institute – as part of the STELR renewable energy module.

The ISME (inspiring Science and Mathematics Education) project, in which STELR was a partner, concluded in March 2017, with the three

partner universities, Southern Cross, Charles Darwin and Wollongong, continuing their engagement with STELR program subsequently.

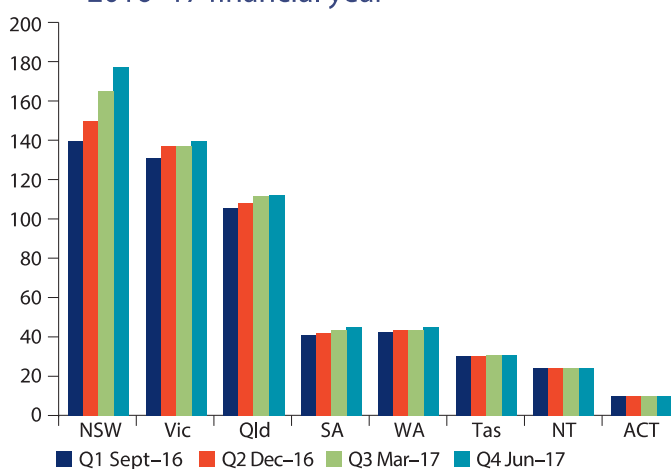
Under this Government-backed project, 15 new curriculum modules were developed by the partner universities and the Australian Mathematical Sciences Institute. They are available to all Australian schools through the STELR website and the Stile Education platform.

ATSE was awarded a \$250,000 grant under the Government's WISE Program (Women in STEM and Entrepreneurship) to produce up to 20 video profiles of women in STEM and STEM entrepreneurship. The project will run until the end of the 2017/18 financial year.

The South East Asian Ministers of Education Organisation (SEAMEO) invited STELR to run a five-day STELR STEM workshop in Bandung, Indonesia. More than 40 teachers, education officials and education academics from Indonesia, Malaysia, Singapore, Thailand, Brunei, Timor Leste and Laos attended.

NSW STELR schools rose from 132 to 176 over the year.

Fig 1 Number of STELR Schools by state 2016–17 financial year



## IMNIS

IMNIS connects motivated PhD students with outstanding, executive-level industry leaders in medical technologies and pharmaceuticals, minerals resources and energy resources in a one-year mentoring program that educates and informs our future scientific leaders about commercialisation and industry. IMNIS also introduces mentees to the breadth of opportunities beyond academia. State-level networking events hosted by IMNIS allow mentors and mentees to connect more broadly and extend their professional networks.

In 2015, IMNIS successfully piloted in 11 universities in three states with the strong support of consortium partner AusBiotech. In 2016, this success was recognised with a prestigious BHERT Best Higher Education and Training Collaboration Award and \$200,000 funding

## MAJOR PROGRAMS

from the industry growth centre MTPConnect, to be backed by matching funds from IMNIS partners. The industry growth centres METS Ignited and NERA also provided seed funding to kick-start programs in Minerals Resources and Energy Resources respectively.

The year saw significant expansion of this IMNIS initiative. In January, ATSE appointed Dr Marguerite Evans-Galea as IMNIS Executive Director to drive the national roll-out of the IMNIS MedTech-Pharma program. In April, ATSE appointed the inaugural Expert Advisory Panel chaired by IMNIS co-founder, Ms Ronnie Wood. These corporate and academic leaders advise on governance and strategy for the IMNIS initiative.

IMNIS is capable of including large numbers of PhD students and provides the opportunity for a diverse range of industry professionals to 'give back' to the STEM community. Between June and August 2017, multiple IMNIS programs launched in Victoria, New South Wales, Western Australia, South Australia and Queensland.

The Academy strongly supports the growth of IMNIS and a number of ATSE Fellows are participating as mentors, advisers and champions.

ATSE gratefully acknowledges funding from the industry growth centres MTPConnect, NERA and METS Ignited, and support from our consortium partner AusBiotech. It is grateful to IMNIS sponsors CSL and KPMG Australia, and supporters FB Rice, Engineers Australia, the Royal Society of Victoria and AusIMM.

## MAJOR INITIATIVES

# Conducting events to optimise our impact and achieve our goals

ATSE conducts a range of National and Division events each year in line with its aspirations to focus on key issues facing Australia. Our key events – the Oration Dinner and the Clunies Ross Awards – are supported by a variety of initiatives in each State.

### 2016 Oration Dinner

ATSE President Professor Hugh Bradlow FTSE presented Fellowship certificates at the Oration Dinner in Melbourne in November to most of the 26 New Fellows the Academy elected for 2016.

They were formally announced at the Academy's Annual General Meeting earlier that day. Most were able to participate in the New Fellows Seminar following the AGM, where they briefed Fellows on their work and achievements.

The 2016 Fellows came from a wide array of sectors and specialisations, including agriculture, bionic vision, biotechnology, cyber security, defence, engineering, geotechnics, ICT, manufacturing, medical research, neurosurgery, photovoltaics, resources, robotics, shipbuilding, structural dynamics and water management.

Each presentation at the New Fellows Seminar was recorded and is available on the ATSE YouTube channel.

The 2016 Oration Dinner attracted 190 people. To mark ATSE's 40 years, Foundation Fellows were acknowledged, as were ATSE's nine Presidents.

A highlight of the event was the 2016 Oration by equality advocate Ms Elizabeth Broderick AO, the former Australian Sex Discrimination Commissioner and Age Discrimination Commissioner, who won acclaim for her address on discrimination issues.



## MAJOR INITIATIVES



Dr Jackie Fairley receives her Fellowship certificate.



The 2017 Clunies Ross Awards winners (from left) Darryn Smart, Andrew Wilks and Mike Xie.

#### BATTERHAM MEDAL

ARC Future Fellow Andrew Fleming won the 2016 Batterham Medal, an award that recognises an early career engineer who has achieved substantial peer and industry recognition in the past five years.

Professor Robin Batterham AO FEng FAA FTSE presented the Medal at the ATSE Oration Dinner.

Andrew Flemming is Associate Professor of Electrical Engineering at Newcastle University. A highly regarded consultant in nanoscale imaging, fabrication, and piezoelectric systems, the results of his work are found in consumer, industrial and scientific devices including mass storage, precision fabrication machines, and scanning atomic force microscopes.

#### 2017 Innovation Dinner and Clunies Ross Awards

A highlight of the year was the ATSE Innovation Dinner in Brisbane in June when the prestigious Clunies Ross Awards, Australia's premier innovation commercialisation awards, went to a select group of Australia's pre-eminent innovators.

The Clunies Ross Awards have been running since 1991 and winners have included many Australians who have become household names through their achievements in applying technology for the benefit of Australia and the world.

Medical research, preventing injuries to soldiers in action and reshaping the way we design and build things were recognised at the dinner, attended by more than 350 people, at the magnificent Brisbane City Hall.

The 2017 Clunies Ross Award winners were:

- **2017 Clunies Ross Entrepreneur of the Year Award**  
Professor Andrew Wilks FTSE, the Melbourne-based co-founder and Executive Chairman of SYNthesis Pty Ltd, is one of few

Australian scientists who have stepped outside the security of the academic environment to focus solely on translating basic research to benefit humankind. His fundamental research on new cell-signalling enzymes, and the resulting new therapeutic blood cancer drugs he and his team have developed, promise to continue to profoundly impact the lives of hundreds of thousands of patients worldwide.

- **2017 Clunies Ross Knowledge Commercialisation Award**  
Mr Darryn Smart, Group Leader, Cyber and Electronic Warfare Division, Defence Science and Technology Group, has developed novel devices to counter improvised explosive devices (IEDs) and protect Australian soldiers and vehicles as well as those of coalition partners. He and his team at the Defence Science and Technology Group (DSTG) in South Australia have designed, developed and produced four unique and highly advanced systems that have been commercialised with an estimated benefit of \$64 million – showing how Australia's cutting-edge technological development can make an impact on the global stage.
- **2017 Clunies Ross Innovation Award**  
Professor Mike Xie FTSE, Director of the Centre for Innovative Structures and Materials at RMIT University, has developed techniques widely-used across diverse industries including engineering, architecture, biomedicine and materials science, which have significantly reduced the weight and associated energy consumption of motor vehicles and aircraft as well as enabled strikingly elegant bridge and building designs. He has made significant contributions to the original development and subsequent adoption of a technology known as Evolutionary Structural Optimisation (ESO) and Bidirectional ESO (BESO).

The Academy acknowledges with thanks the University of Queensland as the Principal Sponsor of the 2017 Innovation Dinner and Clunies Ross Awards.

MAJOR INITIATIVES



*The magnificent Brisbane City Hall.*



*ATSE President Hugh Bradlow and Director Margaret Sheil.*

2016-17 Division events

**DIVISION EVENTS**

ATSE's seven State and Territory Divisions conduct a variety of activities to support the ATSE mission – seminars and workshops, presentations, site visits and briefings, often in conjunction with other bodies. These are increasingly aligned with ATSE's National Technology Challenges and are augmented by events to facilitate engagement and learning among the Fellows.

ATSE Divisions have established and run Parliamentary Briefings on topical issues in several states for parliamentarians and staff. Experts in these areas of interest – often Academy Fellows – brief parliamentarian, advisors and parliamentary staff.

Each Division also holds a New Fellows event, where newly inducted Fellows share their experiences and aspirations with the Fellowship.

A number of Divisions actively engaged with other Learned Academies, Royal Society branches and RIAus taking leading roles in initiatives aimed at enhancing public understanding of science and technology issues.

The **NSW Division** maintained a strong program of events through the year including its *Beyond Coal – What Will Power NSW Symposium* in November to discuss the future of electricity generation in the State. Through the year the Division concluded its Climate Change Luncheon series and commenced its Big Data Lunches. It also held the 2016 Malcolm Chaikin Oration dinner, with the Oration Ideas & Execution: The Yin and Yang of Innovation, by Dr Simon Poole FTSE.

The **Victorian Division** conducted a strong program of events, linking on occasions with the Royal Society of Victoria, the Australasian Industrial Research Group and other key policy bodies. Its program was headlined by its Annual Dinner, addressed by Associate Professor Alan Duffy, a Swinburne University astrophysicist, who discussed Darkness Visible – the Search for Dark Matter.



*Professor Hugh Durrant-Whyte addresses a Big Data lunch in Sydney.*

The **Queensland Division** continued its strong focus on education with its Wonder of Science and Young Science Ambassadors programs and conducted several high-impact events, including new Fellows' evenings, and focused on STEM education.

The SA Division continued its established manufacturing workshops, conducted in conjunction with the SA Government, with national and international expert presenters. It also continued its Parliamentary briefing program, held the annual Norton Jackson New Fellows event and conducted a field visit to the Lonsdale Desalination Plant.

The **WA Division** again presented its annual Eminent Speaker program in conjunction with WA universities and held a number of Fellow-focused events.

The **ACT Division** held a number of events during the year and represented ATSE at numerous functions in the national capital. Its events focused on a variety of topics, including innovation, gravitational wave detection and energy security.

The **Tasmanian Division** continued its collaboration with the Royal Society of Tasmania during the year, holding a public lecture on Hunting for Climate Clues in the Southern Ocean.

# Working hard across multiple fronts to optimise the contribution of women

ATSE continued to play a leading role in achieving recognition for women within the Academy and more broadly in science and technology. It maintained a strong emphasis on electing women to its Fellowship and using their skills and experience as widely as possible in its Forums and Divisions and the specialist Working Groups and Committees that generate much of the Academy's contribution to Australian society.

This achievement owes much to its adoption of its Gender Equity Policy in November 2010. ATSE has a strong and active Gender Equity Working Group advising the Board on gender issues and is a proud partner with the Academy of Science in the Athena Swan initiative to promote the role of women across Australia, initially through research institutions and organisations.

Women's participation in ATSE initiatives and bodies during the year showed encouraging progress. The most visible change has been the gender representation on the ATSE Board, with participation rising to 50 per cent for the past three years and women now holding six of the 10 Board seats. Similarly, ATSE Board Committees and the Assembly now have female membership of more than 30 per cent.

ATSE is proud that women play leading roles in its Forums and Division Committees and is working hard at sustaining that achievement.

The Forums' Leadership Groups in 2016-2017 reflected increased gender focus, with women elected as Chairs of the Education Forum, Health Technology Forum, Industry and Innovation Forum, Minerals

Resources Forum, and the International Collaboration Group – and as Deputy Chairs of the Agriculture Forum, Infrastructure Forum, Mineral Resources Forum and the Water Forum.

ATSE's Gender Equity Working Group is charged with pursuing gender equity targets within ATSE and advocating for gender equity in ATSE's broader areas of influence. This Group has 50 per cent female membership (three of its six members).

## SAGE/Athena SWAN

As a key part of ATSE's program to advocate for gender equity more broadly, ATSE joined the Academy of Science to launch the Science in Australia Gender Equity (SAGE) pilot program to trial of the successful UK Athena SWAN gender equity accreditation program.

The program rates the gender equity policies and practices of participating organisations with a gold, silver or bronze award and helps them to develop ways to promote and retain women and gender minorities in their organisations.

ATSE has played a very active role in the ongoing operations of SAGE.

Working Group members Professor Doug Hilton and Dr Susan Pond served on the SAGE Expert Advisory Group and Dr Ros Dubs and Mr Michael Edwards on SAGE's Project Audit and Review Committee (PARC).

The Gender Equity Working Group took specific actions during the year to enhance the current and longer-term flow of women into the Fellowship, updating and analysing gender data across ATSE to make recommendations to the Board and preparing a working list of nearly 100 potential female Fellows which it fed into the Fellowship nomination process.

The Group also contributed strongly to the development and promotion of the 200th issue of ATSE's issues magazine *Focus*, which was titled *Women in the Driving Seat*.

## 2016 Orator

The Working Group applauded the choice of SAGE Expert Advisory Group Chair Ms Elizabeth Broderick AO as the Academy's 2016 Orator.

Ms Broderick, the former Australian Sex Discrimination Commissioner (2007-2015) and Age Discrimination Commissioner (2007-2011), told ATSE's Orator Dinner that Australia's capacity for innovation and creativity was suffering because we are leaving out half our population.

"Gender equality is now not a case of whether, but a question of how and how quickly," she said.

THE FELLOWSHIP

# Academy fellows are leaders in technology

ATSE's Fellows come from industry, universities, research institutes and government, representing excellence and achievement in technology and engineering. This breadth allows ATSE to provide input on key national issues with the broadest and deepest of perspectives. ATSE is well-positioned to contribute to and guide the debate on innovation for the national prosperity.



The Academy is an independent organisation dedicated to driving technological change for a better Australia.

It was formally inaugurated in February 1976. The concept of an applied sciences academy had its origins in the late 1960s, when the Australian Industrial Research Group (AIRG), an informal association of directors and managers of industrial research and development laboratories, appointed a small committee to study the proposal for such a body put forward by the late Dr W A S Butement, the former Chief Defence Scientist.

The Academy consists of more than 800 Australian Fellows elected each year through a rigorous nomination process managed by the Academy's Membership Committee.

Many ATSE Fellows are recognised for their leadership and achievements. In 2016-17 these included:

## AUSTRALIA DAY HONOURS 2017

**Professor Andrew HOLMES AC FRS FAA FTSE**, Emeritus Professor of Chemistry, University of Melbourne and President of the Academy of Science, was named a Companion of the Order of Australia for eminent service to science through developments in the field of organic and polymer chemistry as a researcher, editor and academic, and through the governance of nationally recognised, leading scientific organisations.

**Dr Graeme Blackman AO FTSE**, Chair of the National Stem Cell Foundation, was named an Officer of the Order of Australia for distinguished service to the pharmaceutical industry, to scientific research and policy development, to theological education and the Anglican Church of Australia, and to aged care.

**Professor Peter Gray AO FTSE**, Founding Director, Australian Institute for Bioengineering and Nanotechnology, was named an Officer of the Order of Australia for distinguished service to science in the field of bio-engineering and nanotechnology as an academic and researcher, and to professional biotechnology associations.

**Professor Max Lu AO FAA FTSE**, President and Vice-Chancellor, University of Surrey, was named an Officer of the Order of Australia for distinguished service to education, to national and international research in the fields of materials chemistry and nanotechnology, to engineering, and to Australia-China relations.

**Professor Colin Masters AO FAA FTSE**, Head, Neurodegeneration Division, The Florey Institute, and Executive Director, Mental Health Research Institute, was named an Officer of the Order of Australia for distinguished service to medical research through international and national contributions to understanding Alzheimer's and other neurodegenerative diseases.

**Dr Christopher Roberts AO FTSE**, former Chief Executive Officer, Cochlear, was named an Officer of the Order of Australia for distinguished service to science and the development and commercialisation of medical biotechnology, particularly through the cochlear implant program, and the management of respiratory conditions.

**Mr David Thodey AO FTSE**, Former Telstra CEO and now Chair of CSIRO, was named an Officer of the Order of Australia for distinguished service to business, notably to the telecommunications and information technology sectors, to the promotion of ethical leadership and workplace diversity, and to basketball.

**Professor Gordon Wallace AO FTSE**, Executive Research Director, ARC Centre of Excellence in Electromaterials Science, University of Wollongong, was named an Officer of the Order of Australia for distinguished service to science and research in polymer materials and their use in biomedical applications, and to national and international collaboration with industry.

**Dr Vaughan Beck AM FTSE**, ATSE Senior Technical Advisor, was named a Member of the Order of Australia for significant service to engineering, to tertiary education administration and research, and to professional academies.

**Professor John Yeaman AM FTSE**, Professor, Civil Engineering and Construction, University of the Sunshine Coast, was named a Member of the Order of Australia for significant service to civil engineering and road asset maintenance management, to professional organisations, and to the community.

**Professor German Carlos Spangenberg PSM FTSE**, from AgriBio, the Victorian Centre for AgriBioscience, was awarded the Public Service Medal for outstanding public service through scientific research programs in the agricultural sector in Victoria.

## THE FELLOWSHIP

## QUEEN'S BIRTHDAY HONOURS 2017

Professor Peter Colman AC FRS FAA FTSE, from WEHI, was named a Companion of the Order of Australia for eminent service to medical research, particularly in the fields of structural biology and medicinal chemistry, as a leader in the commercial translation of scientific discoveries, to professional organisations, and as a mentor of young scientists.

Mr Alan Joyce AC FTSE, CEO of Qantas, was named a Companion of the Order of Australia for eminent service to the aviation transport industry, to the development of the national and international tourism sectors, to gender equity, inclusion and diversity, and to the community, particularly as a supporter of Indigenous education.

WA Chief Scientist Professor Peter Klinken AC FTSE was named a Companion of the Order of Australia for eminent service to medical research and biochemistry through seminal contributions to understanding the genetics of major diseases, and to the people of Western Australia through promoting the importance of science and innovation.

Emeritus Professor Graeme Bird AO FTSE was named an Officer of the Order of Australia honoured for distinguished service to aeronautical engineering, particularly in the field of molecular gas dynamics, as a researcher and academic, to professional scientific organisations, and as a mentor of young scientists.

Emeritus Professor Geoff Fincher AO FTSE was named an Officer of the Order of Australia honoured for distinguished service to science, and to education, in the area of plant genomics, as an academic, researcher and administrator, through scientific advisory roles, and to international professional societies.

Professor Margaret Sheil AO FTSE was named an Officer of the Order of Australia for distinguished service to science and higher education as an academic and administrator, through significant contributions to the national research landscape, and to performance standards.

Dr Katherine Woodthorpe AO FTSE was named an Officer of the Order of Australia for distinguished service to business through venture capital, management and commercialisation initiatives for research and technology based enterprises, and to industry organisations.

Dr Alexander Zelinsky AO FTSE, was named an Officer of the Order of Australia for distinguished service to defence science and technology, to systems engineering, and to education as an academic and researcher.

## AWARDS AND APPOINTMENTS 2016-17

Professor Rose Amal FTSE, from the University of NSW, was named on the 2017 ARC College of Experts.

Former ATSE President Professor Robin Batterham AO FREng FAA FTSE was elected a Foreign Fellow of the Indian National Academy of Engineering.

Professor Trevor Bird FTSE was awarded the James R James Lifetime Achievement Award of the Institution of Engineering and Technology (IET).

Professor David Boger FRS FAA FTSE was named a Member of the US National Academy of Engineering.

Dr Ron Cameron FTSE, Head of the Nuclear Development Division at the OECD Nuclear Energy Agency in London, received the Australian Nuclear Association 2016 Award in December for outstanding contributions to nuclear science in Australia.

Professor Ian Chubb AC FAA FTSE, former Chief Scientist, was elected a Fellow of the Academy of Science and also awarded its Academy Medal.

Dr Martin Cole FTSE, shared the US National Fire Protection Association 2017 DiNenno Prize for the Very Early Smoke Detection Apparatus (VESDA) technology.

Professor Ana Deletic FTSE was appointed Pro Vice-Chancellor (Research) at the University of NSW.

Professor Peter Dowd FTSE was awarded the 2016 Krumbein Medal by the International Association for Mathematical Geosciences.

Dr Frank de Hoog FTSE, a world-renowned Data 61 mathematician, won the 2017 Hannan Medal, awarded by the Academy of Science.

Dr Rosalind Dubs FTSE was appointed a director of ATSE and reappointed for a further three-year term to the Board of ASC Pty Ltd.

Professor Hugh Durant-Whyte FRS FAA FTSE, was named Chief Scientific Adviser at the UK Ministry of Defence.

Professor Benjamin Eggleton FAA FTSE, Director of CUDOS at the University of Sydney, was appointed joint head of the NSW Smart Sensing Network.

Dr Bronwyn Evans FTSE, CEO of Standards Australia and Chair of the Industry Growth Centre for Medical Technologies and Pharmaceuticals, was appointed ISO Vice-President (Finance) for 2017-2018 and was named in the 2016 *Financial Review*/Westpac 100 Women of Influence.

Ms Kathryn Fagg FTSE, ATSE Industry and Innovation Forum Chair and Gender Equity Working Group member, was elected President of Chief Executive Women and won the Ada Lovelace Medal.

Dr Alan Finkel AO FAA FTSE, Chief Scientist, headed an Independent Review into the Future Security of the National Electricity Market.

Professor Rob Fitzpatrick FTSE, Director of the Centre for Australian Forensic Soil Science (CSIRO) and Acid Sulfate Soils Centre (The University of Adelaide) won the inaugural International Union of Geological Sciences award for outstanding international contributions to Forensic Geology and Forensic Soil Science.

Professor Kevin Galvin FTSE won the *Energy Innovation in NSW* Category in the 2016 NSW Premier's Awards for Science and Engineering.

Professor Jay Guo FTSE, from the University of Technology Sydney, was named on the 2017 ARC College of Experts.

Professor Bronwyn Harch FTSE, Executive Director of the Institute for Future Environments and Professor of Applied Statistics at the Queensland University of Technology, was appointed to the Board of Innovation and Science Australia (ISA).

Dr Anita Hill FAA FTSE was elected a Fellow of the Academy of Science.

Dr Carmel Hillyard FTSE was appointed a director of ATSE.

Ms Kathy Hirschfeld FTSE was appointed to the Board of Energy Queensland.

Professor Bruce Hobbs AO FAA FTSE, former WA Chief Scientist, received a Science Excellence Award in structural geology by the International Union of Geological Sciences (IUGS).

Professor Peter Høj FTSE, University of Queensland Vice Chancellor, was appointed Chair for 2017 of the Group of Eight (Go8) universities.

Professor Ron Hui FREng FTSE, Chair in Power Electronics, University of Hong Kong, and Imperial College, London, was elected a Fellow of the Royal Academy of Engineering.

Professor Buddhima Indraratna FTSE, of the University of Wollongong, was named Director of the ARC Training Centre for Advanced Technologies in Rail Track Infrastructure.

Professor Chennupati Jagadish FAA FTSE, from the Australian National University, was elected an Honorary Fellow of the Indian Academy of Science.

Professor Graeme Jameson AO FREng FAA FTSE received a Lifetime Achievement Award from the International Mineral Processing Congress (IMPC).

## THE FELLOWSHIP

**Dr Andrew Johnson FTSE** was appointed Director of Meteorology, succeeding Dr Rob Vertessy FTSE.

**Dr Marlene Kanga AM FTSE**, President of the World Federation of Engineering Organisations (2017-2019) was elected a Foreign Fellow of the ASEAN Academy of Engineering and Technology.

**Mr Dick Kell AM FTSE** was awarded the Peter Nicol Russell Memorial Medal by Engineers Australia.

**Professor Sritawat Kitipornchai FTSE**, University of Queensland civil engineering researcher, was elected to the European Academy of Sciences and Arts (EASA).

**Professor Ross Large FTSE**, of the University of Tasmania, led a team that won the 2016 UNSW Eureka Prize for Excellence in Interdisciplinary Scientific Research.

**Professor Richard Larkins AO FTSE** succeeded Professor Adrienne Clarke AC FAA FTSE as Chancellor at La Trobe University in February 2017.

**Ms Catherine Livingstone AO FAA FTSE** was appointed Chairman of the Commonwealth Bank of Australia.

**Emeritus Professor Jack McLean FTSE** received the Contribution to the Transport Profession Award from the Institute of Transportation Engineers, Australia and New Zealand Chapter.

**Professor Anton Middelberg FTSE** joined The University of Adelaide as Executive Dean of the Faculty of Engineering, Computer and Mathematical Sciences.

**Professor Cynthia Mitchell FTSE** joined the Board of the International Centre of Excellence in Water Resources Management (ICE WaRM).

The late **Mr Henry Muller FTSE** was awarded the inaugural BHP Billiton Technology and Innovation Award.

**Ms Chloe Munro FTSE** was a member of the panel of the Independent Review into the Future Security of the National Electricity Market.

**Dr Mary O’Kane FTSE**, NSW Chief Scientist and Engineer, won the inaugural Ada Lovelace Medal for an Outstanding Woman Engineer and was a member of the panel of the Independent Review into the Future Security of the National Electricity Market.

**Dr Chris Pigram FTSE** was appointed Chair of the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC).

**Mr Ross Pilling FTSE**, former Chairman and Managing Director, BASF Australia and New Zealand, was appointed inaugural chair of

Swinburne University’s Industry Research Advisory Committee.

**Dr Susan Pond AM FTSE**, former ATSE Vice President and Adjunct Professor of the University of Sydney, was appointed chair of the Steering Committee of the NSW Smart Sensing Network and Director of AINST, the Australian Institute for Nanoscale Science and Technology at the University of Sydney.

**Dr Simon Poole FTSE**, Director New Business Ventures of Finisair, was named the 2016 Charles Todd Medallist.

**Professor Karen Reynolds FTSE** won the Engineering category of the 2016 SA Innovation Awards, positioned to elevate South Australia’s innovative women.

**Dr James Ridsdill-Smith FTSE** was appointed an Honorary Member by the Council of the International Congresses of Entomology.

**Professor Veena Sahajwalla FTSE**, Director of UNSW’s Centre for Sustainable Materials Research and Technology, was is the first woman awarded the Jubilee Chair and Professorship by the Indian Academy of Sciences.

**Professor Graham Schaffer FTSE** was appointed Professor of Materials and Design in the School of Engineering and Information, University of Melbourne.

**Professor Len Sciacca FTSE**, previously Chief of Partnerships and Engagement at Defence Science and Technology, was appointed Enterprise Professor at The University of Melbourne.

**Professor Murray Scott FTSE** was elected an Honorary Fellow of the International Council of the Aeronautical Sciences (ICAS).

**Professor Margaret Sheil FTSE** was appointed to the Board of the Australian Nuclear Science and Technology Organisation (ANSTO).

**Dr Richard Sheldrake AM FTSE** joined the Board of the Crawford Fund.

**Professor Craig Simmons FTSE** was named 2016 Water Professional of the Year by the Australian Water Association for his contribution to the industry.

**Professor Michelle Simmons FAA FTSE** won a €100,000 international L’Oréal-UNESCO For Women in Science Award for her pioneering research in quantum physics.

**Dr Erica Smyth FTSE** was appointed Chair of the Advisory Board of the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

**Dr Ziggy Switkowski FTSE** was reappointed as Chair and Non-Executive Director of the Board of NBN Co Limited.

**Professor Doreen Thomas FTSE**, from the University of Melbourne, was named on the 2017 ARC College of Experts.

**Dr Ian Tyler FTSE**, Assistant Director Geoscience Mapping at the Geological Survey of Western Australia, won the Geological Society of Australia Western Australian Division’s 2017 Gibb Maitland Medal.

Deakin University **Professor Svetha Venkatesh FTSE** was named a 2017 ARC Laureate Fellow.

**Professor Branka Vucetic FAA FTSE** was elected a Fellow of the Academy of Science.

**Emeritus Professor Mark Wainwright AM FTSE**, former University of NSW Vice Chancellor, was named chairman of the Sydney School of Entrepreneurship.

**Professor Gordon Wallace FAA FTSE**, from ARC Centre of Excellence for Electromaterials Science, University of Wollongong, won the 2016 CSIRO Eureka Prize for Leadership in Innovation and Science.

**Mr Sam Walsh AO FTSE**, retired Chief Executive of Rio Tinto, was appointed to the Australia Council Board, Chair of the Royal Flying Doctor Service in WA and a Director of Mitsui & Co.

**Professor Zhiguo Yuan FTSE**, from the University of Queensland, a 2015 Clunies Ross Award winner, was named a 2017 ARC Laureate Fellow.

### VALE TO OUR FELLOWS 2016-2017

**Professor William Charters AM FTSE** died in Melbourne on 15 March 2017, aged 82.

**Mr Louis Challis AM FTSE** died in Sydney on 03 June 2017, aged 80.

**Dr John Connell AM FTSE** died in Melbourne on 16 May 2016, aged 102.

**Dr Robert Durie FTSE** died in Sydney on 5 December 2016, aged 90.

**Dr Peter Jones FTSE** died in Sydney on 26 August 2016, aged 83.

**Professor Basil Hetzel AC FTSE** died in Adelaide on 4 February 2017, aged 94.

**Mr Henry Muller FTSE** died in Adelaide on 20 April 2017, aged 82.

**Mr Gerald (Bill) Page-Hanify AM FTSE** died in Brisbane on 13 September 2016, aged 84.

**Foreign Fellow Professor David Strangway OC FTSE** died in Canada on 13 December 2016, aged 82.

**Dr Colin Ward FAA FTSE** died 24 March 2017 in Melbourne aged 74.

# Leading the Academy activities

ATSE Directors at 30 June 2017 were:



## Professor Kaye Basford FTSE

Professor Basford is Head of the School of Biomedical Sciences and Professor of Biometry at the University of Queensland (UQ) and her research leadership and impact is at the interface between statistics, quantitative genetics and plant breeding, with a focus on building strong and influential partnerships.

She was previously President of UQ's Academic Board (2012-14) and Head of the School of Land, Crop and Food Sciences (2001-10). As President of the Board, she was a member of UQ Senate, the governing body of that institution.

Currently, Professor Basford is a member of the Board of Trustees of the International Rice Research Institute, Union College and the Crawford Fund. She has been President of the International Biometric Society and the Statistical Society of Australia Incorporated.

These various roles have enabled her to gain extensive experience in governance and strategic planning. She currently chairs the ATSE Audit and Risk Committee as Vice President, Financial Sustainability, and the International Strategy Group.



## Professor Hugh Bradlow FTSE – President

Professor Bradlow is Chief Scientist at Telstra Corporation in which capacity he acts as advisor to the CEO and the Board and other parts of the business on longer-term technology directions and technology disruption. Prior to becoming Chief Scientist he was Chief Technology Officer and Head of Innovation, responsible for investigating the future technologies that will impact Telstra's business.

Before joining Telstra in September 1995, Professor Bradlow was Professor of Computer Engineering at the University of Wollongong in Australia and Professor of Electrical Engineering (Digital Systems) at the University of Cape Town.

Professor Bradlow is a graduate in electrical engineering from the University of Cape Town in 1973 and received the DPhil degree for research in experimental nuclear physics from the University of Oxford. He is an Emeritus Professor of the University of Wollongong, a Professorial Fellow of the University of Melbourne, and a recipient of a Centenary Medal from the Commonwealth of Australia. He was elected as the joint 2009 Australian Telecommunications Ambassador of the Year. He was listed in the 2010 Global Telecom Business Power 100 rankings and was named by Smart Company as one of the 12 most influential people in Australian ICT.



## Dr David Cook FTSE

Dr Cook lives in Sydney and holds a BE (Hons) from the University of Western Australia and MSc, and PhD from the University of Calgary. He became a Fellow in 1990.

Dr Cook was a faculty member of the School of Civil Engineering, University of New South Wales, first Executive Director of the National Building Technology Centre and Executive Director of the Australian Nuclear Science and Technology Organisation from 1988–1994. He then served in various senior management positions for Boral Limited until 2004.

He is a Member of the Advisory Board of Steritech, an industrial sterilisation company based in Melbourne.

Dr Cook has been a Member of ATSE's New South Wales Division Committee since 2006 and was Chair from 2010-2014. He is currently Vice President, Membership and has served on the Membership Committee since 2012.

## THE ATSE BOARD



### Dr Rosalind Dubs FTSE

Dr Dubs has enjoyed a diverse international business career, holding senior executive and board roles in publicly listed, private and government companies. She is also a non-executive director of Aristocrat Leisure Limited, ASC Pty Ltd, Astronomy Australia Ltd and ANU Enterprise Pty Ltd.

Dr Dubs holds a BSc(Hons) from the Australian National University, and a Docteur ès Sciences in chemistry from the Université de Lausanne. Her executive career gave her wide-ranging commercial and international experience in the aviation, transport and defence industries, and she specialised in the management of large engineering organisations. As part of multinational electronics company Thales SA, she was the Paris-based Operations Vice-President of its global air traffic management business, and, prior to that, Managing Director of the navigation aids business in Stuttgart, Germany. Dr Dubs' most recent executive position was Deputy Vice-Chancellor (External Relations) at the University of Technology Sydney, where she fostered engagement between academia and business.

Dr Dubs chaired the Australian Space Industry Innovation Council from 2010 to 2012. She has also been Director of Operations Support and Acting CEO of Airservices Australia, Registrar of the ANU, and served in CSIRO's senior executive service during 1983-85.

She is a member of ATSE's Industry and Innovation Forum, NSW Division Committee and Gender Equity Working Group.



### Dr Bruce Godfrey FTSE

Dr Godfrey is CEO of Australian Scientific Instruments Pty Ltd and a Director of Wyld Group Pty Ltd. His career has focused on the advancement and commercialisation of technologies (particularly new energy technologies), investment readiness of products and companies, and innovation policy and programs.

Dr Godfrey has strong governance experience acquired from a broad range of executive and non-executive Board and Committee roles, including audit and risk management. He has served on a number of AusIndustry and other government agency innovation funding and advisory committees, including most recently as Chair of the Australian Renewable Energy Agency's Advisory Panel until mid-2014 and as a Member of AusIndustry's R&D Tax Incentive Committee until February 2017.

He chairs the ATSE Energy Forum and is a Member of the Academy's Audit and Risk Committee.



### Dr Paul Greenfield AO FTSE

Professor Greenfield chairs the International Water Centre, a joint venture between two universities. He has a Bachelor degree with Honours and a PhD in Chemical Engineering from the University of New South Wales and a Bachelor of Economics from the University of Queensland. Awarded the Chemeca Medal in 1995, he is a Fellow of the Institution of Chemical Engineers, UK and an Honorary Fellow of the Institution of Engineers, Australia.

Dr Greenfield worked at the University of Queensland from 1975-2011. Initially a Lecturer in Chemical Engineering, he held the roles of Deputy Vice Chancellor (Research) and Senior Deputy Vice Chancellor and Provost from the mid 1990's until 2008. He was Vice Chancellor from 2008 -2011.

Dr Greenfield has extensive experience as a Director and is currently a Director on a number of company boards. He has worked widely with industry on a range of projects spanning the biotechnology, water and energy sectors.

He currently holds positions on the boards of the Great Barrier Reef Foundation as well as the Russo Business School.



## THE ATSE BOARD



### Dr Margaret Hartley FTSE – CEO

Dr Hartley lives in Melbourne and holds a degree in Applied Science (RMIT) and a PhD (Monash University). She joined the Academy as Chief Executive Officer in 2009.

Dr Hartley was previously the Principal Scientific Advisor to the Australian Government Department of Health and Ageing and the Director of the Office of Chemical Safety. She led the Department's human health risk assessment of pesticides and chemicals as well as regulatory policy and environmental health policy. She oversaw regulatory compliance activities for the licit use of narcotics, other controlled substances, antibiotics and drugs in sports and advised the Commonwealth on chemical security issues.

Dr Hartley was Australia's Industrial Chemical Regulator from 1997-2006, responsible for leading and managing the regulation of chemicals and cosmetics and promoting safe and sustainable use of industrial chemicals. As CEO she oversaw governance, financial, and all performance aspects of the business. She oversaw the implementation of best practice regulatory reform within the chemicals sector and led the development of a Community Charter for chemicals regulation and safe use.

Dr Hartley is a respected national and international leader in regulatory policy and science with wide experience in leading and managing Australia's chemical regulatory policy framework. She has overseen human health and safety and environmental protection aspects of chemical safety. She has led international harmonisation efforts in risk assessment methodology via OECD and WHO programs.

Dr Hartley formerly held positions in pharmacology and epidemiology at Monash University and the ANU.



### Dr Carmel Hillyard FTSE

Dr Hillyard is currently an Angel investor, Chairman of Fitgenes Limited, FizzioFit Pty Ltd and Hawaii Biotech Australia Pty Ltd and Deputy Chairman of the Mater Medical Research Institute. She is also a member of the Entrepreneurs' Program Committee of Innovation and Science Australia. Previously, she was a co-founder of venture fund, CM Capital Investments, a director of several of its investee companies and led its Life Sciences group for more than 10 years. She is a fellow of the Australian Institute of Company Directors and has a PhD from London University.

Dr Hillyard has commercialised products from laboratory bench to market and was an inventor of a number of patented technologies. Her previous experience was in medical and diagnostics research in the UK and Australia. She has also mentored entrepreneurs, assisted with commercialisation and licensing and served on a number of government, public and private company boards, including membership of the Industry Research and Development Board and ANSTO.

In recognition of her contributions to biotechnology, she has been awarded the Centenary Medal, the Women in Technology Biotechnology Star award, AusBiotech Excellence Award for Outstanding Contribution and recently, Women in Technology's Entrepreneurial Outstanding and Life Sciences Outstanding awards.



### Professor Karen Reynolds FTSE

Professor Reynolds is Director of the Medical Device Research Institute (MDRI) and the Medical Device Partnering Program (MDPP) as well as Dean (Research) of the College of Science & Engineering at Flinders University. Bridging the divide between research and industry, she is considered one of Australia's leading researchers in biomedical engineering.

Professor Reynolds is Chair of the Academy's Health Technology Forum, and a member of the Australian Medical Research Advisory Board, the TGA's Advisory Committee on Medical Devices, and the South Australian Science Council.

In recognition of her significant contributions, she was named South Australian Scientist of the Year 2012, and awarded Australian Professional Engineer of the Year 2010. In 2015, 2013 and 2012, she was named by Engineers Australia as one of Australia's 'Top 100 Most Influential Engineers', and in 2014 she received the Medical Technology Association of Australia's Outstanding Achievement award.

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## THE ATSE BOARD



### Professor Margaret Sheil AO FTSE

Professor Sheil was appointed as the Provost at the University of Melbourne in 2012. In that role she is the Chief Academic Officer and Standing Deputy to the Vice Chancellor.

Professor Sheil has been a researcher in the field of chemistry, held senior roles at the University of Wollongong and was the Chief Executive Officer of the Australian Research Council (2007-2012). Professor Sheil is a Director of the Australian Nuclear Science and Technology Organisation (ANSTO) and Trinity College, University of Melbourne. She is a member of the Advisory Council of the CSIRO Science Industry Endowment Fund (SIEF), the Clunies Ross Awards Committee of ATSE and the Advisory Board of the Australia Indonesia Centre. She has previously been a member of the Advisory Board for Coursera, and a member of the Prime Minister's Science, Innovation and Engineering Council, the National Research Infrastructure Council and the Cooperative Research Centres Committee.

Professor Sheil holds a Bachelor of Science and a PhD in Physical Chemistry from The University of New South Wales and was presented with the Science and Technology Alumni Award from UNSW in 2016.



*Tackling the technology challenges of our age is a key ATSE focus.*

# Key People

The Academy operates through its key Fellow bodies and an Executive Office in Melbourne. The key bodies through which Fellows act to achieve the Academy's mission are the Assembly, which meets twice a year to set the targets for the Academy; the Board, which takes responsibility for the operational policy to meet these targets; and the Divisions and Forums, which assist the Assembly, Board and Executive Office to deliver the Academy's programs.

## KEY ACADEMY PEOPLE ARE: THE ASSEMBLY 2016-17 (AT PUBLICATION)

Professor Hugh Bradlow FTSE, *President and Chair*

Professor Snow Barlow FTSE, *Victorian Division*

Professor Bogdan Dlugogorski FTSE, *WA Division*

Ms Kathryn Fagg FTSE, *Chair, Industry and Innovation Forum*

Dr Bruce Godfrey FTSE, *Chair, Energy Forum*

Ms Denise Goldsworthy FTSE, *Chair, Minerals Resources Forum*

Dr Alexander Gosling AM FTSE, *Chair, Victorian Division*

Mr John Grace FTSE, *Chair, Clunies Ross Awards Committee*

Dr Margaret Hartley FTSE, *CEO*

Mr Michael Heard FTSE, *Chair, SA Division*

Dr Carmel Hillyard FTSE, *Chair, Queensland Division*

Professor Ross Large FTSE, *Chair, Tasmanian Division*

Professor Jocelyn McPhie FTSE, *Tasmanian Division*

Professor Alison Ord FTSE, *Chair, WA Division*

Dr John Radcliffe AM FTSE, *SA Division*

Professor Timothy Reeves FTSE, *Chair, Agriculture Forum*

Professor Karen Reynolds FTSE, *Chair, Health Technology Forum*

Professor John Richards AM FTSE, *Chair, ACT Division*

Dr Richard Shelldrake AM FTSE, *Chair, NSW Division*

Mr David Singleton FTSE, *Chair, Infrastructure Forum*

Dr John Soderbaum FTSE, *ACT Division*

Dr Brian Spies FTSE, *NSW Division*

Dr Lorraine Stephenson FTSE, *Queensland Division*

Professor Doreen Thomas FTSE, *Chair, Education Forum*

Dr Mark Toner FTSE, *Chair, Gender Equity Working Group*

Dr John Williams FTSE, *Chair, Water Forum*

Dr Paul Greenfield AO FTSE, *Observer*

Professor Margaret Sheil FTSE, *Observer*

Dr Vaughan Beck FTSE, *Observer*

Dr John Bell FTSE, *Observer*

Mr Peter Laver AM FTSE, *Observer*

Professor Mike Manton FTSE, *Observer*

## DIVISIONAL SECRETARIES 2016-17 (AT PUBLICATION)

### ACT

Dr Danny Llewellyn FTSE  
danny.llewellyn@csiro.au

### NSW

Dr Brien Spies FTSE  
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### Queensland

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### SA

Dr John Radcliffe AM FTSE  
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### Tasmania

Professor Jocelyn McPhie FTSE  
j.mcphe@utas.edu.au

### Victoria

Dr Ian Sare FTSE  
iandmsare@bigpond.com

### WA

Dr Ian Tyler FTSE  
ian.tyler@dmp.wa.gov.au

## ACADEMY STAFF 2016-17 (AT PUBLICATION)

Dr Margaret Hartley FTSE, *Chief Executive Officer*

Dr Matt Wenham, *Executive Manager Policy and Projects*

Ms Sue Wickham, *Executive Manager Operations and Events*

Mr Peter Pentland, *Executive Manager ATSE Schools Program*

Dr Marguerite Galea-Evans, *IMNIS Executive Director*

Dr Mark Bradley, *International Innovation Programs Manager*

Mrs Lynn Pagoda, *Company Secretary and Governance Manager*

Ms Pennie Stoyles, *STELR Program Manager*

Ms Jane Crappsley, *Digital Manager*

Ms Janine Rayner, *Senior Research and Policy Officer*

Dr Carolyn O'Brien, *Senior International Relations and Policy Officer*

Mr Dominic Banfield, *Research and Policy Officer*

Dr Emily Finch, *Research and Policy Officer*

Ms Robyn Lawford, *Policy and Projects Administration Officer*

Ms Nivedita Seewoosunkur, *Data Integrity Officer*

Ms Inoka Amarasekara, *WISE Project Officer*

Ms Maria Pridham, *Finance Officer*

Mrs Elvira Copur, *Membership, STELR and Clunies Ross Administration Officer*

Ms Katja Wilmot, *Events Coordinator and Division Support Officer*

Ms Sarah Hayward, *Front of House and Administration Support Officer*

## FINANCIAL SUMMARY

# 2016-17 Financial Summary

Australian Academy of Technological Sciences  
and Engineering Limited  
ABN 58 008 520 394

## Principal Objectives

The long-term objective of the Academy is to promote in Australia the application of scientific and engineering knowledge to practical purposes.

The activities of the Academy during the financial year were directed towards our key strategy of enhancing Australia's prosperity through technical innovation. In particular, the Academy:

- provided evidence-based advice on a range of technology and innovation policy issues to governments, industry and the community;
- provided a forum for debate and policy formulation on important national issues;
- undertook projects on matters of major national significance;
- fostered and recognised excellence in technological sciences and engineering;
- used its international linkages to provide access to expertise from around the world; and
- conducted a STEM education program in 583 Australian secondary schools to promote the relevance of science and technology and a more scientifically literate society.

## FINANCIAL SUMMARY

## Principal Activities

In 2016-17 the SAGE (Science in Australia Gender Equity) pilot (operated jointly by ATSE and the Academy of Science) for the operation of the Athena SWAN Charter into Australian universities, research institutes and other publicly funded research agencies operated with the full participation of cohort one and two member organisations, and bronze award pathway activities are in progress.

Industry Mentoring Network in STEM (IMNIS) completed its 2016 pilot stage evaluation and began the implementation of a national medical technology and pharmacology focused program. Pilot IMNIS programs were developed for areas of energy resources and mining technology and services.

The Academy conducts assessment of the outputs and impacts of its activities to measure their contributions to the achievement of its objectives. The Directors are satisfied that all of its activities are contributing satisfactorily to the Academy's objectives and goals.

There have been no other significant changes in the principal activities of the Academy from the prior year.

## Operating Result

The operating result for the Academy showed total revenue of \$5,580,440.

The major source of income was government grants and contracts accounting for 59.8 per cent of revenue (up from the previous year of 49.6 per cent) with sponsorship accounting for 12.9 per cent (down from 21.3 per cent in previous year).

There was an operational deficit for the year of -\$225,273 (compared to a modest surplus of \$35,126 the previous year). The investment income and realised gains on investment was \$326,711 (up from a deficit of -\$425,321 the previous year) The total comprehensive income for the year was \$101,438.

The financial position remained strong, with total current assets of \$6,638,735 and total current liabilities of \$4,088,505. The asset to current liability ratio was 1.6 (a healthy financial position is reflected in a ratio greater than 1.0).

## 2016-17 Donations

## INDIVIDUALS

Mr Morrish Besley AC FTSE  
 Professor Robert Bitmead FTSE  
 Dr David Brockway FTSE  
 Mr Richard Carter AM FTSE  
 Dr John Connell AM FTSE  
 Dr David Cook FTSE  
 Professor Graham Davies FREng FTSE  
 Dr Alan Donald AM FTSE  
 Dr John Floyd AM FTSE  
 Professor Tony Haymet FTSE  
 Dr Carmel Hillyard FTSE  
 Dr Robert La Nauze FTSE  
 Professor Anthony Linnane FTSE  
 Dr John Sligar FTSE  
 Professor David Solomon AC FTSE  
 Mrs V Solomon  
 Professor Paul Wood FTSE and  
 Mrs Veronica Wood  
 Dr John Zillman AO FAA FTSE

## PHILANTHROPIC

ASCA Education Foundation  
 Finkel Foundation Pty Ltd

## 2016-17 Acknowledgements

We would like to thank sponsors of the Academy's programs over the past 12 months and in particular:

## STELR

Orica Limited – Major Sponsor  
 Australian Power Institute – Sponsor

## ATSE INNOVATION DINNER

University of Queensland – Principal Sponsor

## ABRIDGED AUDITED ACCOUNTS

## Statement of Profit and Loss and other Comprehensive Income for the Year ended 30 June 2017

Australian Academy of Technological Sciences and Engineering Limited

ABN 58 008 520 394

	2017	2016
	\$	\$
<b>Revenue</b>	<b>5,580,440</b>	<b>5,433,497</b>
<b>Expenses</b>		
Learned Fund	(1,879,268)	(1,736,381)
Endowment Fund	(564,861)	(578,051)
Technical Projects	(593,745)	(1,788,706)
International Science and Technology	(1,835,649)	(413,901)
STELR	(882,362)	(824,354)
Awards	(49,828)	(56,978)
<b>Total Expenses</b>	<b>(5,805,713)</b>	<b>(5,398,371)</b>
<b>(Deficit)/Surplus for the year</b>	<b>(225,273)</b>	<b>35,126</b>
<b>Other comprehensive income</b>		
Items that may be reclassified subsequently to profit or loss in future years:		
Fair value gain/(loss) on available-for-sale financial assets	326,711	(425,321)
<b>Total Other comprehensive income for the year</b>	<b>326,711</b>	<b>(425,321)</b>
<b>TOTAL COMPREHENSIVE INCOME FOR THE YEAR</b>	<b>101,438</b>	<b>(390,195)</b>

## Statement of Changes in Equity For the Year Ending 30 June 2017

Australian Academy of Technological Sciences and Engineering Limited

ABN 58 008 520 394

	Retained Surplus	Financial Assets Reserve	Total
	\$	\$	\$
<b>Balance at 1 July 2015</b>	<b>8,152,760</b>	<b>395,763</b>	<b>8,548,523</b>
<b>Comprehensive income</b>			
Surplus for the year	35,126	-	35,126
Other comprehensive income for the year: net fair value gains on available-for-sale financial assets	-	(425,321)	(425,321)
<b>Total comprehensive income for the year</b>	<b>35,126</b>	<b>(425,321)</b>	<b>(390,195)</b>
<b>Balance at 30 June 2016</b>	<b>8,187,886</b>	<b>(29,558)</b>	<b>8,158,328</b>
<b>Balance at 1 July 2016</b>	<b>8,187,886</b>	<b>(29,558)</b>	<b>8,158,328</b>
<b>Comprehensive income</b>			
Deficit for the year	(225,273)	-	(225,273)
Other comprehensive income for the year: net fair value gains on available-for-sale financial assets	-	326,711	326,711
<b>Total comprehensive income for the year</b>	<b>(225,273)</b>	<b>326,711</b>	<b>101,438</b>
<b>Balance at 30 June 2017</b>	<b>7,962,613</b>	<b>297,153</b>	<b>8,259,766</b>

## ABRIDGED AUDITED ACCOUNTS

## Statement of Financial Position as at 30 June 2017

Australian Academy of Technological Sciences and Engineering Limited

ABN 58 008 520 394

	2017	2016
	\$	\$
<b>Assets</b>		
<b>Current Assets</b>		
Cash and cash equivalents	4,619,497	5,276,812
Trade and other receivables	286,226	203,258
Financial assets	1,657,814	950,000
Other assets	75,198	61,694
<b>Total Current Assets</b>	<b>6,638,735</b>	<b>6,491,764</b>
<b>Non-current Assets</b>		
Financial assets	5,567,588	5,319,727
Plant and equipment	88,530	109,508
Intangible assets	66,362	125,691
<b>Total Non-current Assets</b>	<b>5,722,480</b>	<b>5,554,926</b>
<b>Total Assets</b>	<b>12,361,215</b>	<b>12,046,690</b>
<b>Liabilities</b>		
<b>Current Liabilities</b>		
Trade and other payables	167,578	409,247
Income in advance	3,637,335	3,193,208
Provisions	283,592	275,410
<b>Total Current Liabilities</b>	<b>4,088,505</b>	<b>3,877,865</b>
<b>Non-Current Liabilities</b>		
Provisions	12,944	10,497
<b>Total Non-Current Liabilities</b>	<b>12,944</b>	<b>10,497</b>
<b>Total Liabilities</b>	<b>4,101,449</b>	<b>3,888,362</b>
<b>Net Assets</b>	<b>8,259,766</b>	<b>8,158,328</b>
<b>Equity</b>		
Reserves	297,153	(29,558)
Retained surplus	7,962,613	8,187,886
<b>Total Equity</b>	<b>8,259,766</b>	<b>8,158,328</b>



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