AUSTRALIAN ACADEMY OF SCIENCE 2023 ANNUAL REPORT

Australian Academy of Science

ACKNOWLEDGEMENT OF COUNTRY

The Australian Academy of Science acknowledges and pays respects to the Ngunnawal people, the Traditional Owners of the lands on which the Academy office is located. The Academy also acknowledges and pays respects to the Traditional Owners and the Elders past, present and emerging of all the lands on which the Academy operates and its Fellows live and work. They hold the memories, traditions, cultures and hopes of Aboriginal and Torres Strait Islander peoples of Australia.

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Cover: This year the Academy recorded significant achievements that elevated our influence and standing in Australia, the region and globally, including the establishment of the International Science Council Regional Focal Point for Asia and the Pacific, and our support for the establishment of a Pacific Academy.
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CONTENTS

MESSAGE FROM THE PRESIDENT	5
CHIEF EXECUTIVE'S MESSAGE	6
ABOUT THE ACADEMY	7
2023 HIGHLIGHTS	9
THE FELLOWSHIP	11
DIVERSITY AND INCLUSION	17
PHILANTHROPY AND PARTNERSHIPS	19
AWARDS AND FUNDING	25
POLICY INFLUENCE AND ADVICE	29
NATIONAL COMMITTEES FOR SCIENCE	35
INTERNATIONAL PROGRAMS AND COLLABORATION	39
EDUCATION	45
COMMUNICATING SCIENCE	47
ACADEMY OPERATIONS	53
THE SHINE DOME	55

MESSAGE FROM THE PRESIDENT

The 2023 Annual Report presents a record of achievement and impact of which I am very proud. The work of the Academy is as relevant now as ever and it is my privilege to lead an organisation that harnesses its Fellowship and brings science to the service of the nation in such meaningful ways. I am pleased to share in this report a summary of our new Strategic Plan that will provide greater focus for the Academy's activities in the years ahead and ensure we continue to have impact.

Significant achievements for the Academy during the year included bringing together leading minds to gather evidence to inform decisions on how to protect the Great Barrier Reef, prepare our nation for its high-performance computing needs, progress solutions to blood cancer, examine our nuclear science capability and enable international scientific collaboration.

Another highlight was strengthening our global engagement and influence. We established the International Science Council Regional Focal Point for Asia and the Pacific to bring stronger cooperation across science bodies in our region, and launched a grant program supporting scientists from Ukraine.

Our four-year effort to bring science to bear in the Kathleen Folbigg case culminated during the year when she was pardoned in June and in December had her convictions quashed after spending 20 years wrongfully imprisoned. The Academy continues to call for law reform so the justice system can engage more effectively with complex and emerging science.

We celebrated the extraordinary scientific achievements of our Fellows – including Professor Michelle Simmons AO who was awarded the 2023 Prime Minister's Prize for Science – and took pride in our award recipients.

We supported many research projects through grants, including awarding thousands of dollars to early- and mid-career researchers, and worked with teachers and educational experts to support school science and mathematics education.

The Academy's efforts to model and promote diversity and inclusion in the science sector in Australia continued throughout 2023, including embedding the knowledge of Indigenous Australians in our policy work, working with Pacific scholars to assist in the creation of a Pacific Academy, showcasing the work of Aboriginal and Torres Strait Islander scientists through our awards and events, making contributions to the Pathway to Diversity in STEM Review, and continuing to guide the research sector and industry to take an evidence-based approach to diversity by following the recommendations of the Women in STEM Decadal Plan.

I am deeply grateful for the time and expertise of our Fellows, the Fellows of other learned academies, National Committee members, the Early- and Mid-Career Researcher Forum, and many others who contributed during the year. This year, we renewed our efforts to engage with Fellows in their home states to see first-hand the tremendous research being undertaken by them across the country and to better understand the challenges faced at a regional level.

I am also immensely grateful to all our partners and generous donors – without whom much of our work could not occur. In particular, the Academy was incredibly humbled to receive a significant bequest on behalf of Professor Michael Dopita AM FAA. In his time as Treasurer at the Academy, Michael was acutely aware of limited sources of untied funding for the Academy, and his bequest is greatly assisting to further strengthen our capabilities and independence and to ensure decisions – wherever they are made – can be informed by evidence.

I hope you enjoy reading our annual report for 2023.

Professor Chennupati Jagadish
AC PresAA FREng FTSE

CHIEF EXECUTIVE'S MESSAGE

Welcome to the Academy's annual report for 2023.

To give context for the year, a significant internal strategic review of the Academy was undertaken in 2022 and the early part of 2023. The findings of the review identified ways we could improve our impact, performance and long-term financial sustainability, and during the year the Academy focused on implementing these measures.

Five key objectives form the basis of our new strategic plan. More detail is provided in the next few pages.

This year we recorded significant achievements that elevated our influence and standing in Australia, the region and globally, including the establishment of the International Science Council Regional Focal Point for Asia and the Pacific, and our support for the establishment of a Pacific Academy that will enable the voice of Pacific scientists to be heard in global decision-making. I believe the latter will be seen as a significant and historic achievement of the global scientific community and the Academy's influential standing in it.

Our independent policy advice and influence took a big step up this year, enabling us to bring science to the service of decision-makers, particularly those in government and in our justice system.

Our advocacy efforts have been strong and consistent, with a firm focus on reversing a 14-year decline in R&D investment so that science and technology can play their part in meeting our national ambitions. We have also been a leading voice for the science sector as it responds to a changing and complex geopolitical environment.

We commenced a review of the Academy's National Committees for Science to ensure they continue to shape scientific disciplines and maintain linkages between Australia and the global scientific community. We are also undertaking a review of our bye-laws to ensure our governing documents support our ambitions, reflect best practice, and are fit for purpose.

In reading this year's annual report, I'm sure you will see that our commitment to strengthening Australian science – its structure and its people – is steadfast, so that everyone can benefit, and science can continue to underpin civil society.

I thank the Executive Committee and Council for their guidance and commitment to the Academy, as well as the committed and professional staff who work closely with our Fellows to enable the nation to benefit from their expertise. I also offer particular thanks to our donors, supporters and partners, without whom we could not deliver the results presented in the following pages.

More in-depth information about the impact and details of our work is available on our website.

Thank you for your interest in the Academy and I hope you enjoy reading the 2023 Annual Report.

Anna-Maria Arabia

ABOUT THE ACADEMY

70 YEARS OF SCIENCE LEADERSHIP

Established in 1954, the Australian Academy of Science is an independent organisation of distinguished Australian scientists, championing science for the benefit of all.

We are for Australian science: its system, structure, and people.

We support science, celebrate it, and shape it.

We advocate for thriving conditions for scientists and science – and in doing so, we seek to bring science to the service of the nation.

We're working to advance Australia as a country that embraces scientific knowledge, delivering sought-after science advice that influences Australians' actions and contributes to global science.

Founded in 1954 in a moment of great optimism following World War II – alongside national institutions like CSIRO and the Australian National University – the Academy works across institutional, disciplinary, and national borders to provide a forum for discussion, broker knowledge and represent Australian research internationally.

The Academy and its Fellows – of whom there are currently more than 600 – have contributed to how science functions, advising on everything from funding mechanisms to national priorities. We play a pivotal role in engaging with other learned societies and organisations to support the exchange of cultural and scientific information.

OUR VALUES

The Academy reflects organisational values that earn and sustain trust.

The Academy is independent; non-partisan and ethical; acts with integrity, honesty and transparency; and supports diversity and inclusion and is respectful of sources of knowledge, such as those of First Nations people.

STRATEGIC PLAN 2023–2028

The Academy undertook a review of its strategic direction in 2022 to demonstrate its ongoing relevance and impact and to maximise the ability to inject expert, independent and impartial scientific evidence into critical public debates and influence decision-making.

The review found that to build its influence and amplify its impact, the Academy must evolve its scientific leadership, sustain targeted strategic engagement and mobilise the Academy and its resources, including the Fellowship. These principles formed the backbone of the Academy's Strategic Plan 2023-2028.

More about the Academy

Strategic Plan 2023–2028

Australian Academy of Science

WHO WE ARE

The Australian Academy of Science is an independent organisation of distinguished Australian scientists, championing science for the benefit of all.

MISSION

To advance Australia as a nation that embraces scientific knowledge and whose people enjoy the benefits of science.

KEY CHALLENGE

Delivering sought after science advice that influences Australians' actions and contributes to global science

PRIORITIES

- Scientific Leadership
- Mobilising and transforming the Academy
- Sustained Strategic Engagement

OBJECTIVES

- Excellence
- Advice and Advocacy
- Organisational Effectiveness
- Partnerships
- Engagement

COMMITMENTS

Excellence	Advice and Advocacy	Organisational Effectiveness	Partnerships	Engagement
Build a membership of the Academy that reflects the contemporary balance of disciplines, interdisciplinarity and the breadth of the science community	Systematically draw on the Fellowship to develop advice and advocate for science, complemented by other experts as necessary	Robust governance, aligned resources and an investment corpus sufficient to sustain the Academy's activities and underpin its independence	Establish a suite of partnerships to enhance the Academy's opportunity to influence on a domestic and global scale	Communicate the value and benefits of science to decision-makers and the wider community

2023 HIGHLIGHTS

POLICY INFLUENCE AND ADVICE

The Academy convenes scientific expertise to ensure that evidence-based science is heard by the Australian Government, in the courtroom, and wherever science is needed to inform decisions.

In 2023, we:

- published expert reports on possible futures for the Great Barrier Reef, novel negative emissions approaches for Australia, and educating Australia's future bioscientists
- played an integral and sustained role in the Bathurst inquiry into the convictions of Kathleen Folbigg, providing access to the latest scientific evidence and helping the inquiry understand the science
- convened experts in partnership with the Australian Academy of Health and Medical Sciences to inform a parliamentary inquiry into long COVID
- made 31 submissions to government
- released position statements on an Australian system for managing research misconduct, freedom and responsibility of science, and the Voice to Parliament.

INTERNATIONAL ENGAGEMENT

The Academy facilitates Australia's access to global science and technology, promotes strategic partnerships between Australian and overseas researchers, and contributes Australian expertise and leadership in regional and global science networks.

During the year, the Academy demonstrated its growing regional leadership role by establishing the International Science Council Regional Focal Point for Asia and the Pacific. Together with the International Science Council, the Academy facilitated a meeting of Pacific scholars which led to a historic agreement to establish a Pacific Academy of sciences and humanities.

In 2023, we also:

- facilitated a Global Knowledge Dialogue in partnership with the Academy of Sciences Malaysia and the International Science Council, which brought together more than 150 scientists from 31 countries to provide input into regional priorities
- brought together top minds from Australia and overseas at our annual symposium in November to discuss the implications of geopolitical tensions on international science collaboration, and we released a discussion paper on international scientific collaborations in a contested world
- launched the Ukraine-Australia Research Fund, supporting Ukrainian scientists who have fled the war with Russia or who have been unable to work due to the destruction of their workplace
- hosted the 16th Australia–China Symposium on Marine Sciences for Sustainable Development, in partnership with the Chinese Academy of Sciences and the Australian Academy of Technological Sciences and Engineering
- awarded nearly $1 million in travel grants and fellowships to support international collaboration between Australian researchers and their counterparts across the globe
- awarded nearly $100,000 in France and Europe mobility grants to 14 Australian early- and mid-career researchers to collaborate with leading researchers at major science and technology organisations across Europe
- hosted the finale of the eighth Falling Walls Lab Australia for early-career researchers and supported the winners to compete at the global event in Berlin—where Dr Emma-Anne Karlsen of the University of Queensland achieved third place
- supported seven early-career researchers to attend the Lindau Nobel Laureate Meeting in Germany.

NATIONAL COMMITTEES AND FUTURE EARTH AUSTRALIA

Our national committees serve to shape scientific disciplines and anticipate their future needs. This year, the National Committees for Science and Future Earth Australia facilitated collaboration between Australian scientists, governments, industry and NGOs both nationally and abroad.

In 2023, we:

- published an update to the Sustainable Cities and Regions strategy by the Future Earth Australia Early Career Urban Research Working Group
- worked with the Australian Research Data Commons to convene a joint symposium on digital government meeting open science to address grand challenges
- held two early career innovation labs to foster transdisciplinary solutions to key sustainability issues, and convened two conferences dedicated to progressing the recommendations of the Nourishing Australia decadal plan.

DIVERSITY AND INCLUSION

The Academy is committed to supporting excellence in science and empowering the next generation of scientists. We recognise that to achieve this it is imperative that we embrace diversity and inclusion in all its forms and embed diversity and inclusion in everything we do.

In 2023, we:

- implemented recommendations from the Diversity and Inclusion Governance review, including establishing a Diversity and Inclusion Advisory Committee including expert external advisors
- were recognised as an Inclusive Employer in the Diversity Council of Australia Inclusive Employer Index
- expanded our STEM women Australia platform to become STEM Women Global with 1194 profiles at year's end, connecting women in the STEM industries with opportunities and with each other on a global scale
- grew our network of Women in STEM decadal plan champions, welcoming The Australian Research Council Centre of Excellence for Transformative Meta-Optical Systems (TMOS)
- recognised two Aboriginal and Torres Strait Islander researchers, who received the Academy's Aboriginal and Torres Strait Islander Scientist Award
- explored how Indigenous Knowledges are informing the modern world, through our 2023 public speaker series
- made significant progress on our Innovate Reconciliation Action Plan.

BRINGING SCIENCE TO A BROAD AUDIENCE

Communicating effectively on key Academy initiatives and the work of our Fellowship is fundamental to achieving our mission: to advance Australia as a nation that embraces scientific knowledge and whose people enjoy the benefits of science. We achieved this by reaching policymakers, the science community and the public with scientific information they engaged with deeply on the issues that matter most.

In 2023, we brought science to a broad public audience by:

- welcoming nearly 2 million viewers in total to our websites
- delivering more than 50 events – from symposiums to award ceremonies, expert roundtables, and speeches by government ministers and Indigenous Elders
- being featured or mentioned in more than 7,700 articles in Australian and international mainstream media
- digitising important historical documents, including a collection of papers belonging to Professor Sir Mark Oliphant, one of the 20th century's most influential physicists
- publishing and sharing 78 videos on a wide range of science topics.

One of our breaking news videos, exploring Academy Fellow Professor Matthew England's research into the slowing of massive ocean currents, was widely shared online and shortlisted in the Best Use of Video category at the 2023 Mumbrella Publish Awards.

This story, along with the Academy's involvement in the Kathleen Folbigg case, were two of the top news stories featured by the Australian Science Media Centre for 2023.

EDUCATION

We supported primary and secondary school education across Australia by providing:

- access to quality, downloadable, curriculum-aligned teaching resources for mathematics and science through our Education program websites
- online professional learning courses available throughout the year for teachers to complete at their own pace.

In doing so, we reached more than 270,000 people across Australia who have a role in teaching science and mathematics in schools.

THE FELLOWSHIP

The Australian Academy of Science is a Fellowship of the nation's most distinguished scientists, elected by their peers for ground-breaking research and contributions that have clear impact. In all our deliberations we have regard for diversity so that the Fellowship reflects the talented and diverse science sector across the nation. Dimensions of diversity taken into consideration include gender, age, ethnicity, state and region of residence, emerging disciplines and interdisciplinary science.

596
Fellows at December 2023

36
Corresponding Members at December 2023

20
Fellows elected in 2023, including 6 women (30%) and 16 born overseas (80%): 5 China, 4 United Kingdom, 2 India, 2 United States, 1 Germany, 1 Italy, 1 New Zealand

46
prestigious honours and awards received by Fellows

2023 FELLOWS

Professor Timothy Brodribb FAA
Plant Evolutionary Physiologist
University of Tasmania

Professor Liming Dai FAA
Materials Scientist
UNSW Sydney

Professor Mariapia Degli-Esposti FAA FAHMS
Immunologist
Monash University

Professor Michael Fuhrer FAA
Materials Physicist
Monash University

Professor Zaiping Guo FAA FTSE
Materials Scientist
University of Adelaide

Professor Elaine Holmes FAA
Computational Biologist
Murdoch University

Professor David Keith FAA
Ecologist and Conservation Biologist
UNSW Sydney

Professor David Komander FAA
Biochemist and Structural Biologist
Walter and Eliza Hall Institute of Medical Research (WEHI)

Professor Sharon Lewin AO FAA FAHMS
Infectious Diseases Physician and Virologist
University of Melbourne

Professor Jian Li FAA
Antimicrobial Pharmacologist
Monash University

Distinguished Professor Belinda Medlyn FAA
Ecologist
Western Sydney University

Professor Louis-Noël Moresi FAA
Computational Geophysicist
Australian National University

Professor Richard James Payne FAA
Chemical Biologist
University of Sydney

Professor Shizhang Qiao FAA
Materials Scientist
University of Adelaide

Professor Pankaj Sah FAA FAHMS
Neuroscientist
Queensland Brain Institute

Distinguished Professor Brajesh Singh FAA
Soil Ecologist
Western Sydney University

Professor Peter Taylor FAA
Applied Mathematician
University of Melbourne

Professor Leslie Weston FAA
Plant Biologist and Biochemist
Charles Sturt University

Professor Andrew Wilks FAA FTSE FAHMS
Molecular Biologist
SYNthesis Group

Distinguished Professor Xinghuo Yu FAA
Electrical Engineer
RMIT University

CORRESPONDING MEMBERS

Professor Gareth H McKinley FAA FRS
Mechanical Engineer
Massachusetts Institute of Technology (MIT), United States

Professor Linfa Wang FAA FTSE
Virologist
Duke-NUS Medical School, Singapore

DECEASED FELLOWS

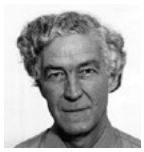
Professor John Lovering AO FAA FTSE
27 March 1930 – 4 January 2023

Emeritus Professor John Pate AM FAA FRS
15 January 1932 – 1 July 2023

Professor Bob Pressey FAA FRS
16 September 1953 – 5 July 2023

Professor Tim Wall FAA
11 March 1925 – 9 July 2023

Professor John White AO CMG FAA FRS
25 April 1937 – 16 August 2023



Professor Allen Kerr AO FAA FRS
21 May 1926 – 14 December 2023

HONOURS AND AWARDS TO FELLOWS

FEATURED HONOURS

RECIPIENT OF THE 2023 PRIME MINISTER'S PRIZE FOR SCIENCE

Professor Michelle Simmons AO FAA FTSE FRS

ELECTED TO THE ROYAL SOCIETY

Dr Graeme Moad
AC FAA FTSE FRS

ELECTED A FOREIGN MEMBER OF THE CHINESE ACADEMY OF SCIENCE

Professor Chennupati Jagadish
AC PresAA FREng FTSE

EUREKA PRIZE RECIPIENT

Professor Toby Walsh FAA

Celestino Eureka Prize for Promoting Understanding of Science

ELECTED AS INTERNATIONAL SCIENCE COUNCIL FELLOWS

Professor John Church
AO FAA FTSE

Professor Cheryl Praeger
AC FAA

Professor Brian Schmidt
AC FAA FTSE FRS

MORE HONOURS AND AWARDS

Professor Matthew Bailes FAA	The Shaw Prize, Hong Kong
Professor Christopher Barner-Kowollik FAA	Centenary Medal, Royal Society of Chemistry, UK
Professor Marcela Bilek AM FAA	Order of Australia: Member in the General Division
Professor John Church AO FAA FTSE	International Science Council, Fellow
Professor John Church AO FAA FTSE	Prince Albert I Medal, International Union of Geodesy and Geophysics
Professor Matthew Colless AO FAA	Order of Australia: Officer in the General Division
Professor David Craik AO FAA FRS	Order of Australia: Officer in the General Division
Professor Nanda Dasgupta FAA	Chancellor's Award for Distinguished Contribution to the University, Australian National University
Professor Richard Ellis CBE FAA FRS	Gruber Prize in Cosmology, Gruber Foundation at Yale
Professor Maria Forsyth AM FAA FTSE	Order of Australia: Member in the General Division
Professor David Gardner AM FAA	Lifetime Achievement Award, American Society for Reproductive Biologists & Technologists
Professor Zaiping Guo FAA FTSE	Australian Academy of Technological Sciences and Engineering, Fellow
Professor Glenda Halliday AC FAA FAHMS	Order of Australia: Companion in the General Division
Professor Peter Hannaford AC FAA	Order of Australia: Companion in the General Division
Professor Eddie Holmes FAA FRS	Croonian Medal and Lecture, Royal Society of London
Professor Chennupati Jagadish AC PresAA FREng FTSE	Australia India Institute, Distinguished Fellow
Professor Chennupati Jagadish AC PresAA FREng FTSE	Chinese Academy of Science, Foreign Member
Professor Chennupati Jagadish AC PresAA FREng FTSE	Pravasi Bharatiya Samman Award, India
Professor David Keith FAA	Ecological Society of Australia, Gold Medal
Emeritus Professor Peter Langridge AM FAA FTSE	Order of Australia: Member in the General Division
Professor Jian Li FAA	AAHMS Fellow
Professor Melissa Little AC FAA FAHMS	Order of Australia: Companion in the General Division
Professor Trevor McDougall AC FAA FRS	New South Wales Scientist of the Year
Professor Lidia Morawska FAA	L'Oreal-UNESCO Award for Women in Science
Professor Robyn Owens AM FAA FTSE	Order of Australia: Member in the General Division
Dr Simon Poole AO FAA FTSE	IEEE Photonics Society, Industry Achievement Award
Emeritus Professor Harry Poulos AM FAA FTSE	International Society for Soil Mechanics and Geotechnical Engineering, Lifetime Achievement Award
Emeritus Professor Cheryl Praeger AC FAA	International Science Council, Fellow
Professor Brian Schmidt AC FAA FTSE FRS Nobel Laureate	Australian Academy of Technological Sciences and Engineering, Fellow
Professor Brian Schmidt AC FAA FTSE FRS Nobel Laureate	International Science Council, Fellow
Professor Brian Schmidt AC FAA FTSE FRS Nobel Laureate	The Shaw Prize, Hong Kong
Professor Susan Scott FAA	Peter Baume Award, Australian National University
Professor Frances Separovic AO FAA	Rosalba Kampman Distinguished Service Award, US Biophysical Society
Professor Michelle Simmons AO FAA FTSE FRS	Boyer Lecture Series, ABC
Professor Brajesh Singh FAA	Soil Science Society of America, Fellow
Professor Carola Vinuesa FAA FAHMS FRS	Lupus Insight Prize, Lupus Research Alliance (USA)
Professor Carola Vinuesa FAA FAHMS FRS	Peter Baume Award, Australian National University
Professor Gordon Wallace AO FAA FTSE	Royal Irish Academy, Honorary Member
Professor Linfa Wang FAA FTSE	The Public Administration Medal (Silver), Singapore
Professor George Willis FAA	Humboldt Research Award, Humboldt Foundation
Professor Xinghuo Yu FAA	Engineers Australia, Honorary Fellow

FELLOWS' INVOLVEMENT IN THE ACADEMY

Academy-related activities in which Fellows were involved included:

Policy submissions and reports • National Committees for Science • international meetings and collaborations • awards committees • sectional committees for assessing candidates nominated for Fellowship • media participation • video and article reviewers and expert interviewees • symposium and online event convenors and expert participants • organisational governance • regional groups • fundraising and partnerships

All involvement by Fellows in the Academy is in a voluntary capacity.

REGIONAL VISITS

This year, the Academy brought together Fellows across Australia in a range of successful networking activities organised by the Regional Chairs and co-Chairs.

Academy President Professor Chennupati Jagadish met with Fellows and other leaders in STEM in each state and the ACT to discuss wide-ranging matters that are relevant to the Academy and that impact Fellows locally.

Highlights included:

- a visit to the Institute for Marine and Antarctic Studies (IMAS) with a tour of CSIRO's state-of-the-art RV Investigator with Dr Steve Rintoul in Hobart
- a symposium and dinner with newly elected Fellows, Academy awardees and early career researchers at Monash University
- a workshop at Curtin University with Academy Fellows, leading researchers, policymakers and representatives from the private sector to discuss technologies to reduce Western Australia's emissions toward zero
- numerous tours of research facilities and laboratories around Australia to learn more about the trailblazing science led by Academy Fellows.

> "Our Fellows are at the forefront of their fields, advancing knowledge and innovation of critical importance to society."
>
> —Professor Jagadish

At Curtin University in October, Professor Jagadish (centre) met with Academy Fellows, leading researchers, policymakers and representatives from the private sector to discuss technologies to reduce Western Australia's greenhouse gas emissions.

REGIONAL CHAIRS AND CO-CHAIRS

Region	Position	Name	Organisation Name
ACT	Chair	Dr TJ Higgins AO FAA FTSE	CSIRO
NSW	Chair	Professor Alison Rodger FAA	Macquarie University
NSW	Co-Chair	Professor Kathy Belov AO FAA	University of Sydney
QLD	Chair	Professor Peter Koopman FAA	University of Queensland
QLD	Co-Chair	Professor Huijun Zhao FAA FTSE	Griffith University
SA	Chair	Professor Geoff Fincher AO FAA FTSE	University of Adelaide
TAS	Chair	Professor Barbara Nowak FAA	University of Tasmania
TAS	Co-Chair	Dr Ian Allison AO FAA	University of Tasmania
VIC	Chair	Professor Rachel Webster AO FAA	University of Melbourne
VIC	Co-Chair	Professor Jamie Rossjohn FAA FAHMS FRS	Monash University
WA	Chair	Professor Stephen Powles FAA FTSE	University of WA
WA	Co-Chair	Professor Kliti Grice FAA	Curtin University

HISTORICAL ARCHIVES

The Basser Library and Fenner Archives of the Academy provide a rare and valuable window into the history of Australian science and discovery. The Academy strives to make this collection available for researchers, students and the community. In 2023, we received more than 60 research requests from local, interstate and international scholars, some from as far away as London, Sweden and the US. Researchers drew material from the personal archives of Academy Fellows and the records of Australian scientific societies, Academy operational records, and from collections documenting the architectural history of the Shine Dome and Ian Potter House.

The Academy encourages the use of its library and archives, which are open to the public by appointment. Collections are being progressively digitised and made accessible online – in 2023, this included papers documenting the foundation of the Academy kept by its first President Sir Mark Oliphant, records revealing details of Professor Frank Fenner's contribution to the global eradication of smallpox, and material detailing developments in plant pathology, geology and early twentieth-century Antarctic exploration by Australian scientists. The material was digitised in collaboration with the National Library of Australia thanks to the support of David Anstice AO. It is now freely available through the Academy's online catalogue.

Clockwise from top left: Images from the Sir Mark Oliphant, Adrien Loir and Stillwell archive collections.

DIVERSITY AND INCLUSION

The Academy aims to be a national leader in diversity and inclusion (D&I) in Australia's science sector. We are committed to supporting excellence in science and empowering the next generation of scientists, and recognise that to achieve this we must celebrate and embrace diversity and inclusion in all its forms and embed diversity and inclusion in everything we do.

The Academy recognises that this commitment must be supported by a strong governance framework and in 2023 we focused on implementing the recommendations of our Diversity and Inclusion Governance Review. Implementation activities are focused on:

- broadening the scope and focus of diversity in all its forms and applying this across all our activities
- developing an overarching D&I policy and reporting against the diversity goals that emerge from this policy
- embedding D&I as a core value across all areas of the Academy
- seeking external expert advice through an advisory committee to inform policy formulation, goal setting, reporting and evaluation.

FOSTERING DIVERSITY IN STEM

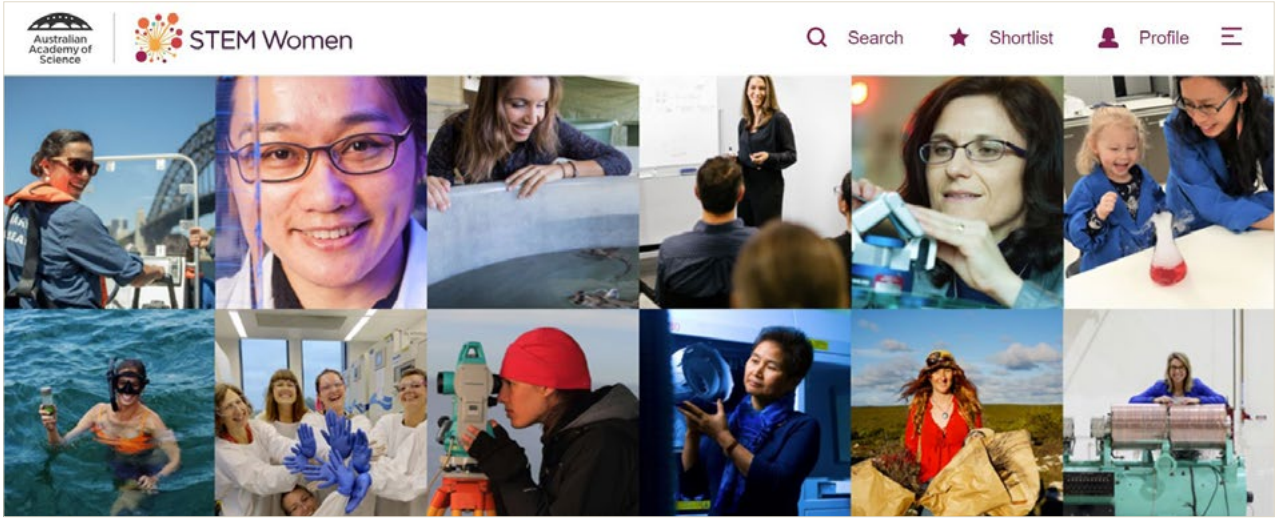
In 2023, the Academy's Women in STEM Decadal Plan remained a key source of guidance to STEM stakeholders on how to achieve gender equity. The Academy spoke to its findings and recommendations at multiple events throughout the year, including the University Collaboration Network and the Advancing the Future: Gender Equity in STEM Workshop.

The Pathways to Diversity in STEM Review, published by the Australian Department of Industry, Science and Resources in early 2024, acknowledged the benefits and impacts of measures that are a direct response to the recommendations in the Women in STEM Decadal Plan, including the:

- establishment of the STEM Equity Monitor
- National Evaluation Guide for STEM equity programs developed by the Women in STEM Ambassador
- STEM Equity Evaluation Portal developed by the Women in STEM Ambassador
- implementation guide for workplace gender equity developed by the Women in STEM Ambassador
- Diversity & Inclusion Toolkit for small and medium enterprises developed by the Australian Academy of Technological Sciences and Engineering.

STEM WOMEN

We work with government, academia and industry to identify and combat barriers to inclusion in STEM activities for underrepresented groups, including women. STEM Women is a searchable portal that enables women working in STEM fields to upload their profile and skills and connect them with career-advancing opportunities.



The number of profiles on the three STEM Women online platforms all grew in 2023.

We have expanded our STEM Women Australia platform to STEM Women Asia and STEM Women Global, connecting women in the STEM sector with opportunities and with each other on a global scale. At the end of 2023, the number of women profiled on each website were:

3,672
STEM Women Australia profiles

418
STEM Women Asia profiles

1,194
STEM Women Global profiles

DECADAL PLAN CHAMPIONS

Women in STEM Decadal Plan Champions are STEM organisations that have agreed to publicly align their gender equity journey with the decadal plan. During the year, we grew our Women in STEM Decadal Plan Champions network, welcoming the Australian Research Council Centre of Excellence for Transformative Meta-Optical Systems (TMOS). Opportunity six identified in the decadal plan is visibility of Women in STEM careers, and we promoted the work of the Champions on the Women in STEM Decadal Plan Champions webpage and showcased female STEM talent through joint events such as the Future Trends Panel in partnership with Nokia.

RECONCILIATION

The Academy works respectfully with Aboriginal and Torres Strait Islander communities to address issues that impact them and invite their contribution to activities enabled by the Academy, including our policy deliberations. The Academy recognised two Aboriginal and Torres Strait Islander researchers, who received our Aboriginal and Torres Strait Islander Scientist Award. We explored how Indigenous Knowledges are informing the modern world in our 2023 public speaker series 'Looking back, moving forward: Indigenous Knowledges informing our modern world', encompassing six events throughout the year:

- Recognising Indigenous Knowledges
- Rivers, groundwater and oceans
- The many facets of fire
- Caring for land and Country
- The sky and stars
- STEM education.

Throughout 2023 we made significant progress on the development of our Innovate Reconciliation Action Plan (RAP). We continued to deliver on the commitments of our Reflect RAP including rolling out new cultural competency training to all staff, engaging in a cultural experience on-country and welcoming our first Aboriginal intern through Career Trackers.

A DIVERSE AND INCLUSIVE WORKFORCE

We continue to nurture a culture of inclusion that embraces diversity in all its forms. We are committed to providing staff with a safe, respectful and inclusive working environment. We promote a culture that supports collaboration and flexibility to deliver strong performance outcomes for the Academy. In 2023 the Academy was recognised as an Inclusive Employer in the Diversity Council of Australia Inclusive Employer Index. We celebrate this achievement and are proud of the inclusive work environment we have created, while recognising there is more we can do as we strive for excellence.

PHILANTHROPY AND PARTNERSHIPS

The generosity of our donors in 2023 helped us reach significant heights. Our awards program thrived, meaning that many young researchers received support to advance their research and foster important collaborations.

INCOME 2023

$647,252
donations

$342,069
sponsorships

Two Ukrainian scientists visited the Academy while in Australia. **From left**: Academy Chief Executive Anna-Maria Arabia, Ukrainian scientist Svitlana Omelchuk, Academy Fellow Dr John Kirkegaard, Ambassador of Ukraine to Australia His Excellency Vasyl Myroshnychenko, Ukrainian scientist Maryna Dzuh, and Academy Fellows Dr TJ Higgins and Professor Frances Separovic.

UKRAINE-AUSTRALIA RESEARCH FUND

Supporting international collaboration was a key feature of philanthropic efforts, particularly through the establishment of the Ukraine-Australia Research Fund. There was very high demand for these grants to support Ukrainian scientists to continue their work through collaborations with Australia, so much so that the Academy opened a second round of funding in the latter part of the year. **See page 43** for more details.

The three winners of Falling Walls Lab Australia 2023 were (**from left**) Hemanshi Galaiya (University of Queensland), Dr Emma-Anna Karlsen (University of Queensland) and Dr Alex Griffin (Cerebral Palsy Alliance Research Institute and University of Sydney)

FALLING WALLS LAB AUSTRALIA

The year also saw new partnerships to support Falling Walls Lab 2023, enabling talented young researchers to showcase their groundbreaking research and measure themselves against the brightest from around the world. The Lab is an international forum for the next generation of outstanding innovators and creative thinkers.

Ten participants gathered at the Shine Dome in Canberra to present their ideas, research and initiatives on the theme 'Which walls will fall next?'. Three emerging innovators represented Australia in Germany – congratulations to Dr Emma-Anne Karlsen from the University of Queensland who placed third in the world.

We thank our partners: the Embassy of the Federal Republic of Germany in Australia, ZEISS, EURAXESS Australia and New Zealand, the DAAD German Academic Exchange Service and the Australia-Germany Research Network. **See page 43** for more details.

BEQUESTS

The Academy was very grateful to receive a significant bequest on behalf of Academy Fellow Professor Michael Dopita. Bequests are a fundamental cornerstone at the Academy that consolidates our independence. Michael's generous bequest is untied, to support the Academy's work and mission.

CELEBRATE SCIENCE

We established the Celebrate Science campaign in 2021 to celebrate Australian scientists and their achievements, and strengthen the Academy's ability to offer scientific advice, comment and education in the national interest.

The Academy's heritage-listed Shine Dome is a symbol of scientific endeavour and achievement in Australia. The campaign invites anyone to celebrate science with us by dedicating a virtual copper roof tile of the Shine Dome to an Australian scientist or science teacher who has made a significant contribution to science. These donations help us to continue to play an essential role as an independent voice for Australian science.

In 2023, the Celebrate Science campaign continued to capture the imagination of the public and foster appreciation for the scientific community. Nominations opened to teachers of science, whose research, mentoring and leadership has led to inspiring generations.

We welcomed dedications to a number of teachers including Dr Kathleen Rachel Makinson for services to science as the first woman at CSIRO to become a Chief Research Scientist, Shri Chennupati Dharma Rao for his mentorship to rural students to pursue education as a pathway to a better quality of life, and Academy Fellow Professor Chris Dickman for inspiring generations of ecologists and conservation managers.

Dedications were made to two women Nobel Laureates, Professor Elizabeth Blackburn AC FRS FAA and Professor Dorothy Hodgkin OM FRS.

By December, the campaign in total had recognised 245 scientists and raised $245,000.

FROM THE ARCHIVES: DAVID SHEPHERD NORTH COLLECTION NOW AVAILABLE ONLINE

A collection of manuscripts held in the Australian Academy of Science archives showcases a little-known multi-decade effort by science, industry and the farming communities of north-eastern Australia to combat sugar cane diseases.

The material has been digitised, thanks to the support of David Anstice AO, and is now freely available through the Academy online catalogue. We thank David for his support towards strengthening our digitisation capability and preserving our scientific culture and history. **See page 16** for more on our archives.

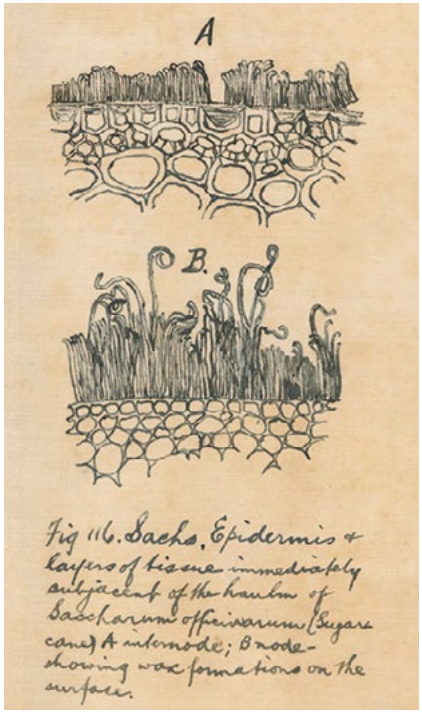
245
scientists recognised

$245K
raised

SUPPORT FOR FUTURE EARTH AUSTRALIA

In February, Grander's Trust donated $50,000 to Future Earth Australia, a national initiative based at the Australian Academy of Science that enables Australian researchers, governments, industry, peak bodies and civil society to connect and collaborate on sustainability issues. These funds were directed to supporting early career researchers and professionals. **See page 37** for more details.

More about supporting the Academy



Below left and below: Material from the David Shepherd North collection was digitised with the support of David Anstice.

THANK YOU TO OUR DONORS

We greatly appreciate the generosity of our donors. Your support ensures the Academy continues to grow.

VISIONARY CIRCLE

Sir Jack Ellerton Becker FAA

Breakthrough Prize Foundation

Professor GW Kenneth Cavil Bequest

Estate of Mr Thomas Lew Davis

Professor Michael Dopita AM FAA

Ian Gordon Ross AO FAA

Estate of Miss JG Russell

Professor John Shine AC FAA FRS

ACADEMY CIRCLE

David Anstice AO

Professor Michael Barber AO FAA FTSE

Professor Suzanne Cory AC FAA FAHMS FRS and Professor Jerry Adams FAA

Professor Mahananda Dasgupta FAA

Dr Jon Day PSM

The Finkel Foundation

Mr Doug Hooley PSM

Ian Potter Foundation

Distinguished Professor Chennupati Jagadish AC PresAA FREng FTSE and Dr Vidya Jagadish

Professor John Newton FAA

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Professor Terence Speed FAA FRS

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Professor Andrew Holmes AC FAA FTSE FRS

Professor Anthony Klein AM FAA

Dr Kenneth McCracken AO FAA FTSE

Professor Frederick Mendelsohn AO FAA

Sir Gustav Nossal AC CBE FAA FTSE FAHMS FRS and Lady Lyn Nossal

Professor Leo Radom AC FAA

Mr John Ralph AC FAA FTSE

Professor Frank Andrew Smith FAA

Walter and Eliza Hall Institute of Medical Research

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Professor Peter Doherty AC FAA FAHMS FRS Nobel Laureate

Professor Denis Evans AM FAA

Dr Jean Finnegan FAA

Professor Ruth Hall OAM FAA

Dr Marshall Hatch AM FAA FRS

Dr Rosalie Schultz

Professor Peter Waterhouse FAA

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Professor Susanne von Caemmerer FAA FRS

Dr Catherine Foley AO FAA FTSE

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Dr Richard Richards FAA FTSE

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Professor Xu-Jia Wang FAA

Professor Ole Warnaar FAA

Professor Rachel Webster AO FAA

Professor John White AO CMG FAA FRS

Emeritus Professor James Williams AO FAA FTSE

THANK YOU TO OUR SPONSORS

ACADEMY SYMPOSIUM: INTERNATIONAL SCIENTIFIC COLLABORATIONS IN A CONTESTED WORLD

PRIME MINISTER'S PRIZES BREAKFAST

SCIENCE PATHWAYS FESTIVAL 2023

FALLING WALLS LAB AUSTRALIA

ANTARCTICA TO SPACE: LECTURE BY MEGANNE CHRISTIAN

POWERHOUSE

UNSW SYDNEY | Centre for Ideas

PROGRESSING THE RECOMMENDATIONS OF THE NOURISHING AUSTRALIA DECADAL PLAN

Dietitians Australia

THE NUTRITION SOCIETY OF AUSTRALIA (INC.)

PUBLIC SPEAKER SERIES

THE edge CATERING

AWARDS AND FUNDING

The Australian Academy of Science offers two types of opportunities for scientists. Our honorific awards recognise outstanding contributions to the advancement of science across the career spectrum. Our funding opportunities support scientists to undertake research projects as well as travel and lectures at a national and international level.

31
award schemes opened and managed in 2023 with 28 associated award selection committees

22
honorific awardees

$401,805
awarded to 48 recipients

23
research awardees

3
conferences and lectures funded

"I appreciate such support offered to young researchers in this challenging and increasingly competitive career, as it not only aids our research but helps to develop us into leaders, so that we may support quality young scientists in the future."

—Dr Rachael Lappan, Monash University, recipient of a 2023 J G Russell Award

HONORIFIC AWARDS

PREMIER HONORIFICS

2023 MATTHEW FLINDERS MEDAL AND LECTURE
Professor Lidia Morawska FAA, Queensland University of Technology

2023 RUBY PAYNE-SCOTT MEDAL AND LECTURE
Professor Jennifer Graves AC FAA, La Trobe University

CAREER HONORIFICS

2023 DAVID CRAIG MEDAL AND LECTURE
Professor David Craik FAA FRS, University of Queensland

2023 HANNAN MEDAL
Professor Richard Hartley FAA, Australian National University

2023 JAEGER MEDAL
Professor Matthew England FAA, University of New South Wales

2023 SUZANNE CORY MEDAL
Professor Terence Hughes FAA, James Cook University

2023 SUZANNE CORY MEDAL
Professor Catherine Lovelock FAA, The University of Queensland

2023 THOMAS RANKEN LYLE MEDAL
Professor Susan Scott FAA, Australian National University

2023 THOMAS RANKEN LYLE MEDAL
Professor Nick Wormald FAA, Monash University

MID-CAREER HONORIFICS

2023 JACQUES MILLER MEDAL
Professor Di Yu, University of Queensland

2023 NANCY MILLIS MEDAL FOR WOMEN IN SCIENCE
Professor Renae Ryan, University of Sydney

EARLY-CAREER HONORIFICS

2023 ANTON HALES MEDAL
Dr Teresa Ubide, University of Queensland

2023 CHRISTOPHER HEYDE MEDAL
Dr Valentina Wheeler, University of Wollongong

2023 DOROTHY HILL MEDAL
Associate Professor Raffaella Demichelis, Curtin University

2023 FENNER MEDAL
Associate Professor Emily Wong, Victor Chang Cardiac Research Institute

2023 GOTTSCHALK MEDAL
Professor Si Ming Man, Australian National University

2023 JOHN BOOKER MEDAL
Dr Amelia Liu, Monash University

2023 LE FÈVRE MEDAL
Associate Professor Rona Chandrawati, University of New South Wales

2023 LE FÈVRE MEDAL
Professor Tianyi Ma, RMIT University

2023 MORAN MEDAL
Associate Professor David Frazier, Monash University

2023 MORAN MEDAL
Dr Rachel Wang, University of Sydney

2023 PAWSEY MEDAL
Professor Yuerui Lu, Australian National University

Top row from left: Professor Susan Scott, Professor David Craik, Dr Rachel Wang, Associate Professor Teresa Ubide, Professor Di Yu, Associate Professor Rona Chandrawati, Professor Renae Ryan, Professor Matthew England. **Middle row**: Professor Richard Hartley, Associate Professor Emily Wong, Professor Jennifer Graves, Professor Si Ming Man, Professor Lidia Morawska, Dr Valentina Wheeler, Professor Tianyi Ma, Associate Professor Raffaella Demichelis. **Bottom row**: Professor Catherine Lovelock, Professor Yuerui Lu, Professor Nick Wormald, Dr Amelia Liu, Associate Professor David Frazier, Professor Terence Hughes



From left: Professor Richard Henley (left) delivered the 2022 Haddon Forrester King Lecture, Professor Tim Senden delivered the 2022 Ian Wark Lecture and Professor Dmitri Golberg delivered the 2022 Lloyd Rees Lecture.

AWARD LECTURES

DELIVERY OF 2023 GEOFFREY FREW FELLOWSHIP LECTURE

The 2023 Geoffrey Frew Fellowship Lecture was delivered in 2023 by Professor Jelena Vuckovic.

DELIVERY OF 2022 HADDON FORRESTER KING LECTURE

The 2022 Haddon Forrester King Lecture was delivered in 2023 by Professor Richard Henley.

DELIVERY OF 2022 IAN WARK LECTURE

The 2022 Ian Wark Lecture was delivered in 2023 by Professor Tim Senden.

DELIVERY OF 2022 LLOYD REES LECTURE

The 2022 Lloyd Rees Lecture was delivered in 2023 by Professor Dmitri Golberg.

CAREER HONORIFIC AWARD PRESENTATIONS

Over two events in August, 10 career honorific awardees from 2022 and 2023 presented their work in a short presentation followed by a Q&A.

CELEBRATING EXCELLENCE IN SCIENCE: CAREER HONORIFIC AWARDS

RESEARCH AWARDS ANNOUNCED IN 2023

2023 J G RUSSELL AWARDS

The J G Russell Award is a prestigious top-up grant made possible by the generosity of the late Miss J Russell, providing up to $7,000 to projects funded through the Australian Research Council's Discovery Early Career Research Award (DECRA). It recognises the costs involved in experimental research and can be used towards equipment, maintenance and travel.

The following early career researchers were awarded top-up funding in 2023:

- Dr Damien Esquerré, Australian National University
- Dr Rachael Lappan, Monash University
- Dr Giorgio Poggesi, University of Western Australia
- Dr Kaitlin Cook, Australian National University
- Dr Scarlett Howard, Monash University

10
career honorific awardees from 2022 and 2023 presented their work

6
early-career researchers awarded top-up funding in 2023



From left: Stephanie Beaupark and Michelle Hobbs received the 2023 Australian Academy of Science Aboriginal and Torres Strait Islander Scientist Award; Dr Antonia Clarke received the 2023 Douglas and Lola Douglas Scholarship in Medical Science.

2023 ABORIGINAL AND TORRES STRAIT ISLANDER SCIENTIST AWARD

This award recognises research in the physical and biological sciences, allowing interdisciplinary and sociocultural research straddling the social sciences and humanities. The award recognises research by outstanding Aboriginal and Torres Strait Islander PhD students and early- and mid-career scientists.

In 2023, Stephanie Beaupark and Michelle Hobbs were recipients of the award.

2023 DOUGLAS AND LOLA DOUGLAS SCHOLARSHIP IN MEDICAL SCIENCE

The scholarship is offered as a top-up scholarship to PhD candidates awarded a National Health and Medical Research Council (NHMRC) Postgraduate Scholarship in one of the areas of Indigenous or primary health care, with preference given by the Academy to the area of Indigenous health research. It is awarded initially for one year (currently $7,000 per annum) with funding available for a maximum of two years.

The 2023 recipient was Antonia Clarke.

THEO MURPHY INITIATIVE (AUSTRALIA)

Established by the Royal Society to further scientific discovery, the Theo Murphy Initiative (Australia) is administered by the Academy and provides grant funding to support career development opportunities for Australian EMCRs in STEM fields.

In 2023, the Academy approved 30 applications, allocating a total commitment of $300,000 to support EMCRs across 20 universities and institutions in Australia. These grants are being distributed among four Flagship activities, six Amplify initiatives and 20 Participation Support grants which will be implemented between January and December 2024.

Two Flagship activities to the value of $65,000, 12 Amplify initiatives totalling $136,800 and 10 Participation Support grants with allocation of $26,425 were supported during the 2022–23 grant round, with implementation occurring in 2023 and 2024.

Projects implemented included events supporting EMCRs in the fields of nutrition science; ageing, dementia and virtual reality; and omics and bioinformatics, among many others.

30
applications approved by the Academy

$300K
to support EMCRs in 2023

POLICY INFLUENCE AND ADVICE

The Academy routinely provides independent scientific advice to decision makers. We draw on the best available evidence and make it accessible and able to inform decisions wherever they are made.

2
major reports and 1 discussion paper informing debates and decisions about international science and national security

6
expert roundtables

31
submissions to government

3
position statements

In 2023, the Academy:

- held a national symposium that brought together leaders from the defence, foreign affairs, security agencies, the university and research sectors, and industry, to explore and debate the balance between national security concerns and enabling the benefits of open scientific collaboration
- played an integral and sustained role in the Bathurst inquiry into the convictions of Kathleen Folbigg, providing access to the latest scientific evidence and helping the inquiry understand the science
- led advocacy efforts to minimise unintended consequences on the research sector as a result of implementation of the AUKUS agreement
- sustained advocacy for a comprehensive review of the research sector to inform a 10-year investment plan to reverse the decline in R&D expenditure
- published a report exploring possible futures for the Great Barrier Reef under different emissions scenarios, and identifying evidence-based strategies to manage the Reef ecosystem, at the request of the Department of Climate Change, Energy, the Environment and Water
- hosted 6 expert roundtables on the supercomputing needs of Australia; the current and future research capabilities of the nuclear science sector; the Great Barrier Reef; and long COVID
- produced a data driven, dynamic 2023–24 science and research snapshot of the federal budget
- published a report on novel negative emissions approaches for Australia
- partnered with the Australian Academy of Health and Medical Sciences to convene experts at Parliament House in Canberra, to inform the Inquiry into Long COVID and Repeated COVID Infections

- released three position statements, on an Australian system for managing research misconduct; freedom and responsibility of science; and the Voice to Parliament
- made 31 submissions to government.

SCIENCE HEARD IN THE COURTROOM

The Academy played a key role over several years in helping to overturn one of Australia's biggest miscarriages of justice, the case of Kathleen Folbigg. Ms Folbigg spent 20 years in prison after being convicted in 2003 of the murder of three of her children, infliction of grievous bodily harm on one child and the manslaughter of her first born.

In 2023, science took centre stage at the second inquiry into Kathleen Folbigg's conviction. Following the inquiry Ms Folbigg was unconditionally pardoned and released from jail, and in December her convictions were quashed by the NSW Court of Criminal Appeal.

The Academy's role in the case, especially that of Academy Fellow Professor Carola Vinuesa and colleagues, was crucial to the outcome. The Academy continues to call for a more science-sensitive legal system in every Australian jurisdiction so that miscarriages of justice are not repeated.

The Academy continues to call for a more science-sensitive legal system in every Australian jurisdiction

Kathleen Folbigg (in purple) with her lawyer Rhanee Rego (left) and Chief Executive of the Australian Academy of Science Anna-Maria Arabia (right) outside the NSW Court of Criminal Appeal after Ms Folbigg's convictions were quashed.

Academy President Professor Jagadish and Chief Executive Anna-Maria Arabia in conversation with Peter Hartcher in the lead-up to the symposium.

ANNUAL SYMPOSIUM: INTERNATIONAL SCIENTIFIC COLLABORATIONS IN A CONTESTED WORLD

The Academy's annual symposium in November brought together leaders from Australia and overseas to discuss the implications of geopolitical tensions on scientific collaboration.

The symposium explored how we can uphold the long-held values of the research enterprise – openness, accountability, objectivity and integrity – while also managing geopolitical tensions and securing the prosperity of Australia and our region.

Issues discussed at the symposium covered a range of topics, including how we reconcile conflicting values like academic freedom, research openness and national security, and the implications of the Defence Strategic Review for international scientific collaboration. The keynote address by Academy President Professor Chennupati Jagadish reinforced the benefits to Australia of international scientific collaboration.

The event dinner featured addresses by Her Excellency Ms Caroline Kennedy, Ambassador of the United States of America to Australia, and His Excellency the Hon Dr Kevin Rudd AC, Australian Ambassador to the United States of America. Ambassador Kennedy commented on the challenge of striking a balance between collaborative research and national security and the need to be 'clear-eyed' about the risks. Ambassador Rudd highlighted the increasing difficulty for normal scientific collaboration to occur in certain physical science areas such as AI.

The symposium was convened by the Academy's Foreign Secretary Professor Frances Separovic and Academy Fellow Professor Steven Chown. The Academy published a discussion paper prior to the event to maximise outcomes of the symposium.

More about the symposium.
See page 23 for information on our event partners.

The Academy convened thought leaders from science research, industry, defence, and foreign affairs to discuss how national security concerns can be addressed while enabling the benefits that open scientific collaboration offers Australia and the world. **From left**: Academy President Professor Chennupati Jagadish, Deputy Prime Minister the Hon Richard Marles MP, Chief Defence Scientist Professor Tanya Monro and Academy Chief Executive Anna-Maria Arabia.

REEF FUTURES ROUNDTABLE REPORT

The Department of Climate Change, Energy, the Environment and Water engaged the Academy as an independent scientific adviser to convene three roundtables to assess the likely future for the Great Barrier Reef in three climate scenarios: near-term, and both low-emissions and high-emissions trajectories in the medium-term. The final report from the roundtable discussions, released in August, explored these futures and identified evidence-based strategies and areas of opportunity to manage the reef ecosystem in the face of unrelenting climate change.

A total of 84 multidisciplinary experts joined the roundtable discussions: the first on climate impacts on functions of the reef, the second on interventions, and the third on the likely future of the reef.

GREENHOUSE GAS REMOVAL IN AUSTRALIA

The Academy published 'Greenhouse Gas Removal in Australia: A report on the novel negative emissions approaches for Australia roundtable' in March.

The report shows how the world needs to remove greenhouse gases from the atmosphere to limit global warming, and Australia can make a major contribution. It also notes that policy frameworks are in their infancy. Australia has an opportunity to play a role by supporting these technologies through government investment vehicles, the refresh of the national science and research priorities, and reporting on greenhouse gas removal through annual climate statements. Greenhouse gas removal, though important, does not diminish the unarguable obligation to reduce emissions and should be a minor part of the worldwide effort to limit global warming.

LONG COVID AND REPEATED COVID INFECTIONS

The Academy, in partnership with the Australian Academy of Health and Medical Sciences, organised a roundtable discussion at Parliament House in February to inform the deliberations of the House Standing Committee on Health, Aged Care and Sport's Inquiry into Long COVID and Repeated COVID Infections. Defining long COVID and understanding knowledge gaps about the condition and its impacts in Australia were among the major themes discussed at the expert roundtable in February.

It was the first time the two academies have jointly convened a roundtable to provide expert, independent advice to a parliamentary committee inquiry, and followed a joint submission to the inquiry from the academies. It brought together experts from across disciplines and sectors, such as infectious diseases, epidemiology, respiratory medicine, primary care, allied health and public health, as well as patients with lived experience.

THE FUTURE COMPUTING NEEDS OF THE AUSTRALIAN SCIENCE SECTOR

The Academy brought together 21 multidisciplinary experts from fields including genomics, computational medicine, climate science, artificial intelligence and quantum physics to discuss the future computing needs of the Australian science sector.

Participants determined that a national strategy backed by at least one international exascale capability is essential to secure Australia's sovereign capability and enable science and research to meet national and regional priorities. This facility would be shared with regional partners in the Asia-Pacific and would advance science in the region while also building a skilled workforce in Australia.

AUSTRALIA'S FUTURE NUCLEAR SCIENCE RESEARCH CAPABILITIES

The Academy convened Australia's leading nuclear science researchers and practitioners to determine the current and future capabilities of the nuclear science sector. The online forum brought together multidisciplinary experts from fields including nuclear physics, nuclear medicine, radiation science, space, nuclear waste management, environmental science, and nuclear regulation and diplomacy.

The roundtable, held in November, assessed the requirements to grow the sector, concluding that Australia's nuclear science sector needs a national strategy in generating new knowledge, and expansion of existing and new facilities. The 23 participants of the national roundtable called for the establishment of an independent knowledge broker between academia, industry and government to advise on national needs and opportunities that require nuclear science in all its dimensions; a national strategy that identifies opportunities to grow education pathways in nuclear science, including the potential to expand the existing program; and a future workforce trained in nuclear science that is able to conduct novel foundational and applied research, and promote multisector collaborations.

EARLY- AND MID-CAREER RESEARCHERS

THE EMCR FORUM

In November, the Early- and Mid-Career (EMCR) Forum hosted the 7th edition of the biennial national EMCR professional development conference, Science Pathways Festival 2023: Reframing Success (SPF23). This month-long event, hosted virtually, brought together EMCRs from around the country to discuss and learn skills for building diverse, equitable and resilient careers, and offered EMCRs the unique opportunity to network with leading scientific professionals from some of Australia's top organisations in public and private enterprise.

SPF23 encompassed a total of 18 distinct sessions with 43 speakers across a wide range of disciplines, career stages, genders, and backgrounds. Sessions included keynote speeches, workshops, roundtable discussions, networking sessions, and panel and information sessions.

In 2023, the EMCR Forum was welcomed into the International Science Council (ISC) as an Affiliate Member and was invited to join the Young Academies and Associations (YAA) Sounding Board. EMCR Program Manager, Dr Mari Kondo presented at the ISC YAA roundtable meeting in Malaysia in October.

43
speakers across a wide range of disciplines

The EMCR Forum is one of the 30 global Young Academy and Association signatories on the statement, 'Call for Action from Young Academies and Young Associations: Reaffirming the Role of Fundamental Sciences in Achieving Sustainable Development through Enhanced and Equitable

6

EMCR Forum submissions to government

Support of Fundamental Research and Early- to Mid-Career Researchers'.

EMCR ENGAGEMENT ACTIVITIES

The EMCR Forum engaged with the Australian government, funding bodies and the media. In January, the EMCR Forum Executive shared their views on the preprint 'The Australian academic STEMM workplace post-COVID: a picture of disarray' in an article in Nature 'Early Career researchers in Australia are miserable at work'.

This was then followed up by an article in the Sydney Morning Herald in February, 'Psychopaths get an edge: Half of young researchers harassed or bullied, says study'. Both articles highlighted the struggles for EMCRs in relation to heavy workloads, bullying and lack of support.

In addition, the EMCR Forum also authored an op-ed titled 'Research misconduct linked to bullying: EMCRs' which was published in Future Campus in September.

The EMCR Forum made six submissions to government in the following areas:

- ARC's Discovery Program Grant Process Review
- improving alignment and coordination between the Medical Research Future Fund and NHMRC's Medical Research Endowment Account
- two submissions relating to Australia's science and research National Science and Research Priorities
- Pathway to Diversity in STEM Review
- Australian Universities Accord Interim Report, calling for a holistic national policy for researcher training and support for sector mobility and opportunities outside the university sector for EMCRs.

In addition to government consultations, the EMCR Forum participated in these national and international roundtables and surveys:

- the Australian Council for Learned Academies' EMCR Networks roundtable discussion on research assessment, which fed into the Office of the Chief Scientist's review, Research Assessment in Australia: Evidence for Modernisation.
- Science and Technology Australia's STEM Career Pathways consultation
- a joint project by the Global Young Academy, the InterAcademy Partnership and the ISC to understand and shape the future of researcher assessment.

NATIONAL COMMITTEES FOR SCIENCE

The Academy's 22 National Committees for Science foster their disciplines in Australia and are responsible for encouraging and maintaining linkages between Australia and the global scientific community.

The committees provide guidance and advice on Australia's membership to the International Science Council (ISC) and 30 international scientific unions and affiliated bodies of the ISC.

Domestically, the National Committees are responsible for engaging and supporting their respective discipline communities. This is achieved primarily by developing and implementing discipline-strategic plans along with periodic state of-the-discipline reviews, and by contributing to scientifically informed policy through submissions, white papers and other input mechanisms facilitated by the Academy. The National Committees also initiate specialist forums, conferences and workshops.

In 2023, the National Committees for Science increased their reach and influence through greater investment in domestic policy. The committees are uniquely positioned to represent the diversity of the Australian science and research sectors, which is extremely advantageous in amplifying and elevating science perspectives to government.

The committees returned to strategic in-person meetings following a period meeting online for several years. The committees will adopt a hybrid format to meet in coming years.

30
international scientific unions and affiliated bodies of the ISC

22
National Committees for Science

22 National Committees for Science
Agriculture, Fisheries and Food
Antarctic Research
Astronomy
Biomedical Sciences
Brain and Mind
Cellular and Developmental Biology
Chemistry
Crystallography
Data in Science
Earth Sciences
Earth System Science
Ecology, Evolution and Conservation
Geography
History and Philosophy of Science
Information and Communication Sciences
Mathematical Sciences
Materials Science
Mechanical and Engineering Sciences
Medicine and Public Health
Nutrition
Physics
Space and Radio Science

NATIONAL COMMITTEE CHAIRS

CHAIRS' MEETING

The Academy hosted the National Committee chairs and delegates at the Shine Dome in November. The meeting focused on the ongoing review of the National Committees and context-setting in the Australian and international science landscapes.

CHANGES TO NATIONAL COMMITTEE CHAIRS

The following committees changed chairs in 2023.

National Committee for Earth System Science

Professor Andy Pitman FAA succeeded **Professor John Finnigan** FAA

National Committee for Geographical Sciences

Emeritus Professor Iain Hay succeeded **Professor Graciela Metternicht**

National Committee for Information and Communication Sciences

Professor Ampalavanapillai Nirmalathas succeeded **Professor Shazia Sadiq**

National Committee for Mathematical Sciences

Professor Adrian Baddeley FAA succeeded **Professor Alan Welsh** FAA

National Committee for Space and Radio Sciences

Professor Phil Bland succeeded **Professor Fred Menk**

DISCIPLINE PLANNING

ASTRONOMY DECADAL PLAN 2026–2035

The Australian astronomical community is undertaking a formal strategic planning process with a 10-year timeframe, led by the National Committee for Astronomy. The planning process was initiated at the 2023 Astronomical Society of Australia Annual Science Meeting and will be launched at the 2025 meeting.

10-YEAR STRATEGIC PLAN FOR AUSTRALIAN CLIMATE PREDICTIONS

The National Committee for Earth System Science initiated the development of a decadal plan for Australian climate predictions, that:

- assesses the current capabilities in the area
- identifies critical gaps in capabilities for the delivery of enhanced global and regional predictions using Earth system and climate system models
- identifies international trends and initiatives in the area over the period 2026–2035
- provides strategies, recommendations and implementation priorities and resources required to ensure robust global and regional predictions using Earth system and climate system models.

The report will be published in 2024.

REPORTS

BIOSCIENCE 2030: EDUCATING AUSTRALIA'S FUTURE BIOSCIENTISTS

The National Committee for Biomedical Sciences published Bioscience 2030: Educating Australia's future bioscientists. The report explores opportunities and challenges for bioscience teaching in the coming decade. It outlines practical recommendations for higher education bioscience teaching and identifies essential transferable skills for bioscience graduates.

REVIEW OF THE DECADAL PLAN FOR PHYSICS

The National Committee for Physics finalised an internal review of the Physics decadal plan 2012–2021 and its progress against the recommendations. The committee also published Physics frontiers: A decade of Australian achievement, a compilation of case studies exemplifying the diverse, challenging and exciting careers to which a physics background can lead.

EVENTS

DATA FOR THE PEOPLE: DIGITAL GOVERNMENT MEETS OPEN SCIENCE TO ADDRESS GRAND CHALLENGES

The National Committee for Data in Science and the Australian Research Data Commons convened a public symposium on digital government meeting open science to address grand challenges.

EMCR CONFERENCES

The National Committee for Nutrition convened two EMCR conferences to progress the recommendations of the Nourishing Australia decadal plan:

- 'Empowering EMCRs to lead the future of the science of nutrition' was funded by the Theo Murphy Initiative (Australia)
- '2023 Boden Research Conference: Advancing the science of personalised and precision nutrition' was funded by the Boden Research Conference scheme.

FUTURE EARTH AUSTRALIA

Future Earth Australia is a national initiative to catalyse, collaborate and connect research and practice for sustainability transitions that are grounded in people and place.

A national node in the global Future Earth network, Future Earth Australia is a knowledge broker for Australian researchers, governments, industry, peak bodies, and civil society to collaborate on global change issues. It represents top Australian sustainability research institutes and schools, and is uniquely placed as an independent, cross-sector, transdisciplinary platform focused on resilience and sustainable development in all its forms.

EARLY CAREER URBAN RESEARCH GROUP

The Early Career Urban Research Group, convened by Future Earth Australia and the RMIT Urban Futures Platform, published a response to the decadal plan for urban sustainability as part of a wider review being undertaken by Future Earth Australia on its sustainable cities agenda.

Early Career Urban Research Group participants attending the RMIT workshop.

The decadal plan was launched in December 2019, ahead of a volatile period for Australia's cities and regions which included the COVID-19 pandemic as well as fires, floods and extreme weather events. Other challenges facing Australia's cities and regions include the housing affordability and rental crisis, and broader cost of living pressures.

The group identified a series of recommendations to reset Australia's approach to urban sustainability and transformation, urging a greater focus on the role of Country, biodiversity and knowledge sharing in the resilience of our cities and regions.

This work is part of the broader Future Earth Australia Co-Lab initiative, which brings together transdisciplinary and cross-sector cohorts of early career researchers and professionals to address key sustainability challenges. The program is part of a wider effort from Future Earth Australia to strengthen collaboration across disciplines, knowledge systems, sectors and industries at the early career level, and elevate early career perspectives in current sustainability debates.

NEW FUND TO FOSTER COLLABORATION

Future Earth Australia designed a new funding initiative to help students, researchers and professionals collaborate on Australia's most pressing sustainability challenges. The Future Earth Australia Opportunities Fund is a competitive small grants program aiming to support early career skills development and collaboration across the sustainability and environment sector.

The fund awarded individual bursaries to early career researchers and professionals working and researching in the environmental and sustainability sciences. Funding was also dedicated to projects which promoted transdisciplinary and collaborative approaches to core sustainability problems.

Projects supported by the Opportunities Fund in 2023 will address Australia's biodiversity, aquaculture, and climate adaptation challenges, as well as elevate Indigenous knowledges and storytelling in the broader sustainability landscape.

This program is generously supported by Grander's Trust.

GRANDER'S TRUST

Grander's Trust donated $50,000 to the work of Future Earth Australia early in 2023. This donation is supporting capabilities, ensuring the best science and research underpins policy and leadership in sustainability in Australia.

In 2023, Future Earth Australia utilised this funding to build on its track record of advancing Australia's sustainability agenda. Priorities included advising on oceans, urban and climate adaptation policy, creating a space for early- and mid-career researchers to connect, building and sharing skills and applying knowledge across sectors, and continuing engagement with partners both nationally and internationally to raise the profile of Future Earth Australia and associated networks.

The Academy thanks Grander's Trust for this support and investing in a regenerative vision for Earth.

PROMOTING TRANSDISCIPLINARY APPROACHES TO SUSTAINABILITY

In 2023, Future Earth Australia shared its work at key national and international events, including the Adaptation Futures Conference in Montreal and at Transformations 2023, hosted by the University of Technology Sydney.

Future Earth Australia strengthened its regional and global links, establishing its membership on the Future Earth Asia Regional Committee, and delivering an address to the Bangladesh Academy of Sciences Symposium on Sustainable Development. Linkages with the International Science Council Regional Focal Point for Asia and the Pacific will help shape the application of science for sustainability across the region.

INTERNATIONAL PROGRAMS AND COLLABORATION

The Academy facilitates Australia's access to global science and technology, promotes strategic partnerships between Australian and overseas researchers, and contributes Australian expertise and leadership in regional and global science networks. This year, the Academy stepped up its international engagement.

42
grants awarded under the Ukraine-Australia Research Fund

10
EMCRs nominated to the Japan Society for the Promotion of Science Postdoctoral Fellowship program

5
Australian EMCRs participated in 14th HOPE Meeting with Nobel Laureates

14
grants awarded under the France and Europe EMCR Mobility Grants program

7
young Australian scientists participated in the Lindau Nobel Laureate Meeting

5
Science 20 (S20) meetings participated in

42 grants were awarded under the Ukraine-Australia Research Fund, supported by the Breakthrough Prize Foundation. The fund distributed $730,000 in funding to support Ukrainian scientists to undertake short-term visits to Australia, or remotely access cutting-edge Australian facilities.

14 grants were awarded under the France and Europe EMCR Mobility Grants program, supported by the Rod Rickards Fellowship and Bede Morris Memorial Funds, providing almost $100,000 to Australian researchers for international travel expenses.

10 EMCRs were nominated to the Japan Society for the Promotion of Science Postdoctoral Fellowship program, travelling to Japan for between 12 and 24 months with the fellowship providing airfares, a settling-in allowance, and an ongoing living allowance.

7 young Australian scientists participated in the Lindau Nobel Laureate Meeting in Germany, with the support of Science and Industry Endowment Fund (SIEF) – Australian Academy of Science Fellowships.

5 Australian EMCRs participated in the Japan Society for the Promotion of Science 14th HOPE Meeting with Nobel Laureates.

Participation in 5 Science 20 (S20) meetings chaired by the Indian National Science Academy on the topic Transformative Science for Sustainable Development

AUSTRALIA–CHINA SYMPOSIUM

After a four-year hiatus due to the COVID-19 pandemic, the Academy was delighted to host the 16th Australia–China Symposium on Marine Sciences for Sustainable Development, in partnership with the Chinese Academy of Sciences and the Australian Academy of Technological Sciences and Engineering.

Since 2004, these annual meetings have provided opportunities to build strong bilateral networks and increase international research collaborations between Australia and China.

INTERNATIONAL SCIENCE COUNCIL REGIONAL FOCAL POINT FOR ASIA AND THE PACIFIC

In the first of five years leading the International Science Council Regional Focal Point for Asia and the Pacific, the Academy:

- facilitated a meeting of 60 scholars from across the Pacific with the National University of Samoa in Apia, which led to a historic agreement to establish a Pacific academy of sciences and humanities
- supported the Establishing Committee for a Pacific academy of sciences and humanities to hold its first face-to-face meeting
- facilitated a Global Knowledge Dialogue in partnership with the Academy of Sciences Malaysia and the International Science Council that brought together more than 150 scientists from 31 countries to provide input into regional priorities
- appointed the members of the ISC Regional Focal Point Advisory Council to help guide the focus for priority programs and engage and expand the ISC membership in the region.
- connected 40 nominations from the region to support the review of UN Sustainable Development Goals for Asia and the Pacific region.

PACIFIC ACADEMY TO BE ESTABLISHED

In a truly historic day in October, 60 Pacific scholars from across the Pacific Island nations gathered in Samoa and overwhelmingly agreed to establish a Pacific academy of sciences and humanities. The landmark meeting was facilitated by the International Science Council Regional Focal Point for Asia and the Pacific, which is led by the Australian Academy of Science.

There is currently no mechanism for Pacific scholars to convene under one Academy to bring together their knowledge to inform regional and international decision-making, despite the region experiencing profound impacts arising from global environmental and social change. Decisions that affect the Pacific are often made without input from the local scientists and indigenous communities that possess unique knowledge about their region and its people. A Pacific academy, designed by Pacific scholars, will provide a mechanism to draw on expertise from within the region, and empower local experts to contribute to global decision-making as a united voice for science in the Pacific.

Participants at the gathering in Samoa agreed to set up an Establishment Committee with representation from across the Pacific Island nations to assist in establishing an academy for science and the humanities that will support the unique requirements of the Pacific and its people. The Academy supported the first Establishment Committee meeting and the ongoing establishment process through the Regional Focal Point.

Attendees at the landmark meeting in Apia, Samoa, where more than 60 Pacific scholars agreed to establish a Pacific academy of sciences and humanities.

Top: Professor Frances Separovic, the Academy's Foreign Secretary, speaking at the ISC Global Knowledge Dialogue in Kuala Lumpur.
Above: The first Global Knowledge Dialogue to be held in Asia and the Pacific saw 150 participants engaging in a wide range of topics and planning next steps for the group.

ASIA AND PACIFIC SCHOLARS RALLIED AT GLOBAL KNOWLEDGE DIALOGUE

Participants from 31 countries came together in Kuala Lumpur on 6 October for the first Global Knowledge Dialogue to be held in Asia and the Pacific.

Jointly hosted by the Regional Focal Point for Asia and the Pacific, the Academy of Sciences Malaysia and the International Science Council, the event saw 150 participants contribute to topics such as mission science for sustainability, interdisciplinary health and living within planetary boundaries, addressing the SDGs through science advice and diplomacy, AI and a breakout session on building the voice of science in the region.

Next steps identified by the group included amplifying the scientific voice in policy-making and ensuring the role of media in science communication; science diplomacy including the potential establishment of an ISC-INGSA science diplomacy program; promoting and strengthening representation of scientists from the region in both regional and global multilateral processes; ensuring responsible use of AI for the public good; building capacity in education and research; and fostering connections between ISC Members.

FRANCE AND EUROPE MOBILITY GRANTS

A total of just under $100,000 was awarded to 14 Australian early- and mid-career researchers (EMCRs) to collaborate with leading researchers at major science and technology organisations across Europe.

The grants, valued up to $7,500 each, were made possible by the generous support of the Rod Rickards Fellowships and the Bede Morris Memorial Fund.

Ten EMCRs were awarded a 2023 France and Europe EMCR Mobility Grant, funded by the Rod Rickards Fellowships. They were:

- Dr Karen Alt, Monash University – Theranostics: Therapy and diagnostic in a single agent
- Dr Guanyu Deng, University of Queensland – Study on fatigue and wear service performances and associated failure mechanisms of an additive manufactured novel cost-effective high entropy alloy
- Dr Shashi Goonetilleke, University of Adelaide – SweetFlow: Study of the genetic architecture of phenology-related traits and heat/chill requirements in sweet cherry
- Dr Sara Kyne, University of New South Wales – Iron nanoparticles for sustainable synthetic transformations
- Dr Yang Liu, James Cook University – Field-deployable chemical sensors for water quality monitoring in the Great Barrier Reef
- Dr Chandnee Ramkissoon, University of Adelaide – Exploring the toxicity of amorphous silica in engineered stone dust: Implications for lung disease prevention
- Dr Emily Remnant, University of Sydney – Building an integrated Varroa management strategy for Australia's honeybee industry
- Dr Neil Robinson, University of Western Australia – Spins on the move: Magnetic resonance hyperpolarisation for next-generation materials development
- Dr David Skerrett-Byrne, University of Newcastle – Paternal stress signatures that shape offspring health
- Dr Jing Zhang, University of South Australia – MOF-polymer hybrid materials for functional 3D printing under visible light.

Four EMCRs were awarded a 2023 France and Europe EMCR Mobility Grant, supported by the Bede Morris Memorial Fund:

- Dr Maciej Daniszewski, University of Melbourne – Transplantation of organoid-derived retinal cells for vision restoration in animal models and assessment of cell function and integration
- Associate Professor Jenny Fisher, University of Wollongong – A view from the south: Exploring Southern Ocean mercury cycling and what it means for the UN Minamata Convention
- Professor Kim-Anh Lê Cao, University of Melbourne – New statistical methods to integrate microbiome studies
- Dr Ludovic Rapp, Australian National University – Restructuring matter with laser pulses at ultra-relativistic intensity: Search for new silicon phases.

UKRAINE-AUSTRALIA RESEARCH FUND

The Academy launched the Ukraine-Australia Research Fund, awarding just over $330,000 in the first round. The funding supported the following two activities, each offering practical support to enable the continuation of research and technology activities by Ukrainian scientists.

Short-term visits – enabled Ukrainian researchers to participate in short-term visits to Australia to engage in research at a host institution, or to participate in a conference and site visit program

Facility access – enabled Ukrainian researchers to access leading infrastructure capabilities in Australia, such as supercomputing facilities, microscopy and microanalysis facilities, and telescopes, by sending their samples to National Collaborative Research Infrastructure Strategy (NCRIS) facilities for analysis, with the results returned to the Ukrainian research institute.

The first round of funding supported 21 Ukrainian scientists who have fled the war with Russia or who have been unable to work due to the destruction of their workplace. The second round was opened later in the year and successful participants announced in early 2024.

The Academy thanks the Breakthrough Prize Foundation for providing $730,000 to support this program, the Australian institutes and researchers hosting Ukrainian visitors, the NCRIS facilities and Directors Group for their ongoing contributions to the program, and the Ukrainian participants.

FALLING WALLS LAB

In November, Dr Emma-Anne Karlsen from the University of Queensland was awarded third place in the Emerging Talents category of the Falling Walls Science Breakthrough of the Year at the Falling Walls Science Summit in Berlin.

Dr Karlsen was one of three Australians, and one of 100 young innovators, selected from more than 2,300 submissions across the globe to present her work in this prestigious competition supporting research and innovation. Competing with her from Australia were Alex Griffin and Hemanshi Galaiya.

The top three were chosen from 10 emerging innovators, who gathered at the Shine Dome in Canberra in September to present their ideas, research and initiatives on the theme 'Which walls will fall next?'. The 10 finalists were selected from earlier heats in Adelaide, Sydney and Brisbane.

Each finalist had just three minutes to make their pitch in front of a jury of eminent academics and business and diplomatic leaders, chaired by Academy President Professor Chennupati Jagadish.

The 10 finalists who competed at Falling Walls Lab Australia in September, with Dr Karlsen at centre back.

72ND LINDAU NOBEL LAUREATE MEETING

Seven of Australia's brightest young scientists attended the 72nd Lindau Nobel Laureate Meeting dedicated to physiology and medicine in Germany. The Australian delegation was led by nutrition scientist and Academy Fellow Professor Jennie Brand-Miller.

This event is a highly prestigious annual gathering of Nobel Laureates and approximately 600 young scientists from around the world. The meeting provided an opportunity for young Australian scientists to share their research, experiences and ideas, and gain inspiration from fellow emerging scientists and Nobel Laureates.

The Academy also organised a Research Innovation Tour in Berlin the week before the Lindau meeting. The tour enabled the young scientists to visit research institutes connected to their fields of studies, including the Charité University Berlin, the Humboldt University, the Max Planck Institute for Human Development and the German Centre for Rheumatic diseases (Rheumaforschungszentrum).

The participation of Australian scientists in the Lindau Nobel Laureate Meetings is supported by the Science and Industry Endowment Fund (SIEF) and administered by the Australian Academy of Science.

THE INTERNATIONAL SCIENCE COUNCIL AND INTERNATIONAL UNIONS

The Academy is Australia's adhering body to the International Science Council (ISC) and 30 international scientific unions and scientific committees, facilitating Australian expertise and leadership in regional and global science networks. In 2023, the Academy:

- made nominations for Australian researchers to senior positions on international science organisations
- encouraged and supported bids for four major international meetings in Australia between 2025 and 2030.

NOTABLE HONOURS GIVEN TO AUSTRALIANS

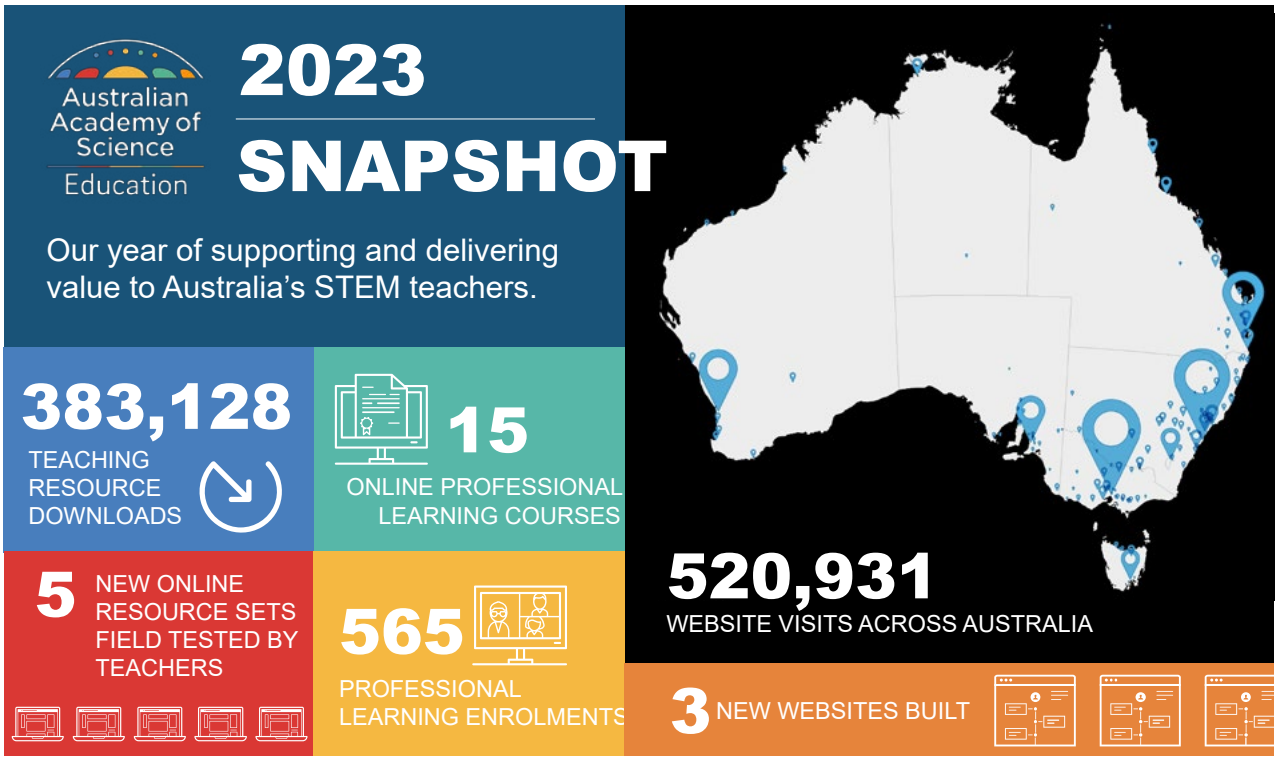
Congratulations to the following Australians who were made ISC Fellows:

- Professor Peter Bridgewater
- Professor John Church AO FAA FTSE
- Emeritus Professor Roy MacLeod OAM FAHA FASSA
- Associate Professor Andreea Molnar
- Professor Cheryl Praeger AC FAA
- Professor Anina Rich
- Professor Brian Schmidt AC FAA FTSE FRS

The Academy welcomed the news that Professor Mary Garson AM was elected Vice-President (and incoming President for 2026) of the International Union of Pure and Applied Chemistry (IUPAC). This is recognition of Professor Garson's significant contribution to chemistry both in Australia and internationally.

EDUCATION

The Academy supports Foundation to Year 10 Australian teachers to develop their mathematics and science teaching practice and embrace the opportunities that STEM education offers through our innovative programs – Primary Connections: linking science with literacy, Science by Doing, and reSolve: Mathematics by Inquiry.



During the year, we supported primary and secondary school education across Australia by providing:

- access to quality, downloadable, curriculum-aligned teaching resources for mathematics and science through our program websites
- online professional learning courses available throughout the year for teachers to complete at their own pace.

In addition to this ongoing and sustained provision of support, a significant focus of the year was transformation. Our education programs underwent rich refinement and refreshment intended to enhance and extend offerings to support teachers building their capability and confidence.

October 2023 Design for Learning Lab – teacher-led design approach

TEACHER-LED DESIGN APPROACH

Central to the transformation of the Academy's education programs has been the introduction of new ways for teachers to provide input and feedback to the development of our school education programs.

These teacher-led approaches were initially trialled with primary teachers in NSW and the ACT, providing an immersive professional learning program for teachers to explore and test new digital educative teaching resources and innovative approaches to professional learning ahead of larger scale releases.

The approach also offered teachers the opportunity to contribute to new learning sequences, including testing them in their classroom context, and provide feedback that will inform these and future new resources.

Feedback received contributes to informing design changes regarding how end users engage with the platform and allows for iterative changes to be made throughout the design and testing process.

ENGAGEMENT THROUGH EVENTS

Ms Margaret Shepherd, President-Elect of the Australian Science Teachers Association (left), with Professor Jagadish and Professor Beazley at CONASTA70

NATIONAL AUSTRALIAN SCIENCE TEACHERS ASSOCIATION CONFERENCE (CONASTA70)

The Academy attended Australia's national conference for science teaching, CONASTA70 in Adelaide in July, delivering three workshops to build awareness of our education programs and preview our new online resources in development.

Additionally, the Academy was the presenting partner for cornerstone conference event, the Stanhope Oration. As the presenting partner, Academy President Professor Chennupati Jagadish and Secretary Education and Public Awareness Professor Lyn Beazley reinforced the important role educators play in developing Australia's future STEM capability and the work the Academy does to support this.

The CONASTA70 Stanhope Oration was delivered by Dr Kristin Alford, the inaugural Director of the future-focused museum, MOD, at the University of South Australia. As a leading futurist and engineer engaged in creating participatory experiences for young people, Dr Alford's expertise and multi-disciplinary perspective was of great interest and value to participating educators.

STATE AND TERRITORY MATHEMATICS EDUCATION EVENTS

The Academy was involved in presentations and workshops at state and territory mathematics education events in 2023, including the ACT Directorate of Education teacher conferences in March and June and the Association of Independent Schools NSW.

COMMUNICATING SCIENCE

The Academy plays a unique and essential role as a trusted and independent source of science and science advocacy, communicating with thousands of people daily through media, social media, on our websites and via email.

2023 HIGHLIGHTS

2,000
mentions of the Academy by mainstream media in relation to the Kathleen Folbigg case

78
videos produced on scientists and science topics

1,000
social media shares of an Academy video featuring Professor Matthew England FAA

1.76M
website visitors

50
online and hybrid events delivered

Digitised
a collection of papers by the Academy's first President Sir Mark Oliphant AC KBE FAA FTSE FRS

From left: Academy Fellow Professor John Shine, Chief Executive Anna-Maria Arabia and President Professor Chennupati Jagadish spoke to media following a submission by Counsel Assisting the Second Inquiry into Kathleen Folbigg's convictions in April. In that submission, the assisting lawyers said that it was open for the Inquirer, Tom Bathurst, to find reasonable doubt about Ms Folbigg's convictions.

SCIENCE HEARD IN THE KATHLEEN FOLBIGG CASE

The Academy's role in the Kathleen Folbigg case is detailed earlier in this report.

The Academy produced videos, making the case and the science underpinning it accessible to the general public. The videos were supplemented with multiple media releases, public statements by the Academy's President and Chief Executive and comprehensive coverage on our social media channels.

As a result, the Academy featured in more than 2,000 media stories or mentions on this issue, making up about 25% of our total media coverage in 2023. This high level of media interest amplified the crucial role of science in the Folbigg case to a broad audience.

OCEAN CURRENTS STIR GLOBAL INTEREST

Our professional breaking news videos provide trusted sources of scientific discoveries and progress in a format designed for media and online use. This year, our video exploring the research of Academy Fellow Professor Matthew England into why massive ocean currents are slowing down, was shared globally online and subsequently shortlisted in the Best Use of Video category at the 2023 Mumbrella Publish Awards.

The video contributed to media coverage of Professor England's ground-breaking research and was reshared more than 1,000 times online, making it the Academy's highest performing post on social media for 2023.

ORIGINAL CONTENT AND WEBSITE ENGAGEMENT

The Academy published and shared 78 videos on a wide range of science topics during the year. The videos profiled Fellows elected to the Academy in 2023 and recipients of the Academy's many awards. We also produced many videos about the Academy's support of and involvement in science, including visits to Australia by Ukrainian scientists with the support of the Breakthrough Prize Foundation.

Our science-focused Curious website, science.org.au/curious, received 1.36 million visitors, while the Academy website, science.org.au, saw 400,000 visitors throughout 2023.

Revolution in treating childhood cancer

1:25 WATCH

The scientific effort to remove greenhouse gases

3:36 WATCH

Painkillers embedded in backyard plants

2:11 WATCH

MEDIA

In 2023 the Academy featured or was mentioned in 7,778 stories. Broken down by media type, this included Australian online news (35%), international online news (35%), Australian broadcast media (28%) and Australian print media (2%).

A news.com.au story about the 2023 Australians of the Year, including Academy Fellow Professor Tom Calma announced as Senior Australian of the Year, was shared 3,600 times on Facebook, making it the most shared story on social media in which the Academy was mentioned.

SOCIAL MEDIA

Our social media posts received more than 11 million impressions, helping us communicate significant moments in science in a timely and accessible way.

TOTAL SOCIAL MEDIA

2,466,561
total audience

3,310
posts published

11,117,638
impressions

351,294
engagements

2,555,547
video views

SOCIAL MEDIA PLATFORMS

	X (formerly Twitter)	Facebook	Instagram	LinkedIn	YouTube
Engagements	105,895	203,305	3,385	24,832	14,896
Published posts	1,682	389	210	310	93

EVENTS

The Academy delivered more than 50 online and hybrid (online and in-person) events for audiences across Australia and around the world.

ACADEMY SYMPOSIUM: INTERNATIONAL SCIENTIFIC COLLABORATIONS IN A CONTESTED WORLD

On Tuesday 14 November 2023, the Australian Academy of Science held its national symposium, 'International scientific collaborations in a contested world'. This event facilitated a national dialogue about how national security concerns can be addressed while enabling the benefits that open scientific collaboration offers Australia and the world. **See page 31** for more about this event.

PUBLIC SPEAKER SERIES 2023: LOOKING BACK, MOVING FORWARD: INDIGENOUS KNOWLEDGES INFORMING OUR MODERN WORLD

The 2023 Public Speaker Series, 'Looking Back, Moving Forward: Indigenous knowledges informing our modern world', was convened by Academy Fellow Professor Tom Calma, Dr Jordan Pitt and Vanessa Sewell. The six-part series looked at the intersection between Indigenous knowledge systems and non-Indigenous knowledge, as well as the importance of recognising Indigenous knowledge to inform decisions made across society. Most of the speakers were Indigenous researchers and knowledge-holders. Topics covered included fire, water, astronomy, STEM education and caring for Country. The series was delivered in a hybrid style, offering both in-person and online options for attendees and speakers.

CELEBRATING THE RECIPIENTS OF THE 2023 PRIME MINISTER'S PRIZES FOR SCIENCE

The annual breakfast to celebrate the recipients of the 2023 Prime Minister's Prizes for Science was held at the Academy's Shine Dome in October. The breakfast included an address by the Hon Ed Husic MP, Minister for Industry and Science, and an award ceremony recognising those who received prizes, as well as the teachers highly commended for teaching excellence.

ANNUAL SCIENCE–LAW SYMPOSIUM

In conjunction with the Australian Academy of Law, the Academy delivered the annual joint symposium for 2023 in Canberra, Sydney and Melbourne in December with special guest speaker Dame Julie Maxton DBE, Executive Director of the Royal Society in London. Dame Julie discussed the role and reliability of science in the court system, challenges associated with forensic science and eyewitness testimony, and ways in which the courts can keep pace with advances in science and technology and new types of evidence presenting in courtrooms.

OTHER ACADEMY EVENTS

- Data for the people: Digital government meets open science to address grand challenges
- Celebrating excellence in science: Career honorific awards
- 2022 Lloyd Rees Lecture
- 2022 Ian Wark Lecture
- 2022 Haddon Forrester King Lecture
- 2023 Boden Research Conference: Advancing the Science of Precision and Personalised Nutrition
- Elizabeth and Frederick White Research Conference: Integrated Earth 2023
- Research Roadmap for Blood Cancers webinar series
- Report launch: Greenhouse gas removal in Australia
- Science Pathways Festival 2023: Reframing Success
- Falling Walls Lab Australia
- Empowering EMCRs to lead the future of the science of nutrition
- From Antarctica to Space via Bologna, Italy: a lecture by Dr Meganne Christian
- Future trends panel: Innovation and connectivity in the metaverse
- Celebrating 75 years of CSIRO Journals of Scientific Research

Our in-person flagship event, Science at the Shine Dome, is now held every second year (on even years) rather than annually, and planning commenced for the 70th anniversary event in September 2024.

NEWSLETTERS AND EMAIL CAMPAIGNS

Newsletter and email campaigns continue to be a channel of significant value for communicating Academy announcements, awards and events and to engage with a broad audience.

The number of subscribers to Academy newsletters at year's end was just over 64,000. In addition to the Academy newsletter, the Science Policy and Diplomacy newsletter and Space and Radio science newsletter – which communicate initiatives and announcements in those specific areas – also had notable increases in subscribers.

In 2023, the Academy sent 130 email campaigns and newsletters to subscribers of Academy email lists, which equated to 564,110 emails sent.

SCIENCE JOURNALS

HISTORICAL RECORDS OF AUSTRALIAN SCIENCE

Historical Records of Australian Science (HRAS) is published in January and July each year by CSIRO Publishing on behalf of the Academy. HRAS publishes peer-reviewed articles with supplementary material on the history of science in Australia and the southwest Pacific, biographical memoirs of deceased Fellows of the Academy, subject bibliographies and book reviews. The journal's editors are Dr Sara Maroske and Professor Ian Rae, with book review editor Dr Martin Bush. Helen M. Cohn compiles the bibliography of the history of Australian science.

An Editorial Committee of Fellows and other experts guides the journal's direction. HRAS is published online only, with hard copies available by request for an annual subscription fee. Biographical memoirs are freely accessible on the Academy website after publication. In 2023, 32 articles were submitted for publication compared to 19 in 2022. The journal published 6 historical articles, 3 biographical memoirs, 2 book reviews, a bibliography of Australian science and a volume index.

AUSTRALIAN JOURNALS OF SCIENTIFIC RESEARCH

CSIRO Publishing and the Academy jointly published 14 journals of scientific research. The journals have an international readership, with subscribers in 90 countries. They can be accessed for free by scientists in more than 100 developing nations through the United Nations' Research4Life program. About half the published articles originate outside Australia. Editorial policy is determined by a Board of Standards, which is jointly chaired by CSIRO and the Academy.

CSIRO Publishing supports both 'Green' and 'Gold' Open Access to help authors reach the broadest audience and to enable unrestricted access to scholarly research. All Open Access articles undergo the same rigorous peer review as those published under a subscription model.

The 14 CSIRO Publishing Journals published 957 articles for 2023 volumes.

This image from HRAS Vol 34 No 2 2023 is in a paper about John Staer, whose name was commemorated in the Albany Blackbutt, *Eucalyptus staeri*. Using a biographical lens, the paper examines the intersection of Western science and commerce in plant collection and naming, and the ways in which these processes exclude or discount Indigenous knowledge. The image is captioned: *Eucalyptus staeri* (Maiden) Kessell & C.A.Gardner, NSW354469, National Herbarium of New South Wales (courtesy of the Atlas of Living Australia).

75 YEARS OF THE AUSTRALIAN JOURNALS OF SCIENTIFIC RESEARCH CELEBRATED

The year marked the 75th Anniversary of the Australian Journals of Scientific Research, governed jointly by CSIRO and Australian Academy of Science through a Board of Standards.

CSIRO Publishing and the Australian Academy of Science celebrated the anniversary in Canberra in December. The event marked the long-running collaboration between the Academy and CSIRO, which publishes around 1,000 articles every year under the 14 journal titles.

The growing journal archive reflects Australia's rich history of science and the continuing impacts of Australian scientists on international research. Most importantly, communicating the outcomes of science in journals supports future learning and understanding.

Celebrating a long and productive relationship between CSIRO and the Academy are (**from left**): Professor Max Coltheart AM FAA FASSA, Co-Chair, CSIRO Publishing Board of Standards; Anna-Maria Arabia, Chief Executive, Australian Academy of Science; Professor Bronwyn Fox FTSE, Chief Scientist, CSIRO; and Andrew Stammer, Director, CSIRO Publishing.

ACADEMY OPERATIONS

GOVERNANCE

The Australian Academy of Science is overseen by a Council of 17 Fellows from across a range of disciplines to represent the Academy's interests. The Council is assisted by an Executive Committee (EXCOM) of seven Fellows who each take responsibility for different areas of the Academy's operations and activities.

COUNCIL

Professor Chennupati Jagadish AC PresAA FREng FTSE
President

Professor Malcolm Sambridge FAA
Secretary Physical Sciences

Professor Helene Marsh AO FAA FTSE
Secretary Biological Sciences (until May 2023)

Professor Bob Graham AO FAA FAHMS
Secretary Biological Sciences (commenced May 2023)

Professor Frances Separovic AO FAA
Foreign Secretary

Professor Ian Chubb AC FAA FTSE
Secretary Science Policy

Professor Lyn Beazley AO FAA FTSE
Secretary Education and Public Awareness

Professor Marilyn Anderson AO FAA FTSE
Treasurer

Professor Jim Williams AO FAA FTSE
Observer

Professor Alan Andersen FAA
Member (commenced May 2023)*

Professor David Bowtell FAA
Member

Dr John Kirkegaard FAA
Member

Professor Julian Gale FAA
Member

Professor Bob Graham AO FAA FAHMS
Member (until May 2023)

Professor Paul Mulvaney FAA
Member

Professor Colin Raston AO FAA
Member

Professor Louise Ryan AO FAA
Member

Professor Veena Sahajwalla FAA FTSE
Member

Professor Stephen Simpson AC FAA FRS
Member (commenced May 2023)

Professor Jonathan Sprent FAA FRS
Member

* Professor Andersen filled a casual vacancy from Oct 2022 to May 2023 when his full term commenced

EXCOM

Professor Chennupati Jagadish AC PresAA FREng FTSE
President

Professor Malcolm Sambridge FAA
Secretary Physical Sciences

Professor Helene Marsh AO FAA FTSE
Secretary Biological Sciences (until May 2023)

Professor Bob Graham AO FAA FAHMS
Secretary Biological Sciences (commenced May 2023)

Professor Frances Separovic AO FAA
Foreign Secretary

Professor Ian Chubb AC FAA FTSE
Secretary Science Policy

Professor Lyn Beazley AO FAA FTSE
Secretary Education and Public Awareness

Professor Marilyn Anderson AO FAA FTSE
Treasurer

Professor Jim Williams AO FAA FTSE
Spokesperson for Integrity (observer)

SECRETARIAT SENIOR MANAGEMENT TEAM

Anna-Maria Arabia
Chief Executive

Melissa Abberton
Chief Operating Officer

Andrew Hood
Chief Information Officer

Christopher Anderson
Director Science Policy

Claudette Bateup
Director Education

Kate Groves
Director Philanthropy

Karen Holt
Director Fellowship and Awards

Dr Petra Lundgren
Director International Science Council Regional Focal Point for Asia and the Pacific

Shauna McKay
Director People and Culture

Nancy Pritchard
Director International Programs and National Committees

Paul Richards
Director Communications and Outreach

FINANCIAL REPORT 2022–23

Read the Academy's financial report for 2022–23

ACADEMY EMPLOYEES

68

staff at December 2023,
50 FT, 18 PT, 51 female, 15 male,
2 gender not specified

The Academy hosted 14 interns for various periods. Academy staff worked across six Australian states and territories and 1 international location, with staff based in the following:

57 ACT • 5 NSW • 2 QLD • 2 VIC • 1 TAS • 1 WA • 1 NZ

.

Academy staff celebrated a great 2023 at the annual end-of-year gathering

THE SHINE DOME

A symbol of Australian science, the iconic Shine Dome hosted over 140 external events, with nearly 7,500 participants. Clients included universities, federal and state government departments, peak bodies and not-for-profit organisations. In 2023, both the Shine Dome and the adjacent Ian Potter House hosted wedding receptions.

To keep up with the varied needs of clients, the Shine Dome also formally opened the Suzanne Cory meeting room. This is a bespoke meeting space that can host small board meetings, intimate dinners and serve as a break-out space for larger conferences.

140+
external events

7,500
participants