

AUSTRALIAN ACADEMY OF SCIENCE **2020 ANNUAL REPORT**



CONTENTS

President’s message	3
Chief Executive’s report.....	4
Strategic Plan 2018–2022	6
2020 highlights	7
The Fellowship	9
Philanthropy and partnerships	16
International	22
Awards and funding	27
Policy influence and advice	35
Education	38
Diversity and inclusion	40
Communicating science	44
The Shine Dome	49
Academy operations	51

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ISSN 1448-2037

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PRESIDENT'S MESSAGE



Welcome to the 2020 Annual Report of the Australian Academy of Science. It was a year of immense challenges: not only did the pandemic throw the world into disarray, but the year began in the middle of Australia's devastating bushfire crisis and with a severe hailstorm damaging the Academy's buildings in Canberra. Despite these challenges, I am proud of the way we responded as an Academy and the impressive results we achieved.

The Academy played a proactive role in the Australian COVID-19 response by joining with the Chief Scientist and other learned academies to form the Rapid Research Information Forum, providing timely and expert advice to government. We also developed an expert database that connected experts with stakeholders, and shared evidence-based information for a broad audience through our online communication channels. Additionally, we adapted how we operated and continued to recognise excellence in Australian science and support the needs of our scientific community.

I sincerely thank our Council members for their service and guidance of the Academy during the year. In particular I would like to thank Emeritus Professor Jim Williams for his contributions as Secretary Physical Sciences from 2016 to 2020 and previously as a Council member from 2013 to 2016, and Professor Max Coltheart, a Council member from 2017 to 2020. We welcomed Professor Malcolm Sambridge to the role of Secretary Physical Sciences in 2020, and Professor Louise Ryan and Professor Lyn Beazley as new Council members.

The Academy elected 24 new Fellows and admitted two new Corresponding Members. The pandemic meant that they were recognised a little differently during the year, through virtual methods of celebration including videos featuring their work. Official events for the new Fellows of 2020 and 2021 are planned for later in 2021, and I look forward to working with our newest Fellowship members into the future, each of whom brings unique experience and wisdom to contribute to the Academy's goals.

Our Fellows were recognised widely around the globe for their expertise and achievements through various forums, including through academic institutions and the mainstream media. In particular, we saw Professor Susan Scott, Professor David Blair and Professor David McClelland receive the Prime Minister's Prize for Science, with their colleague Professor Peter Veitch, for their achievements towards the first detections of gravitational waves.

The Academy's own honorific awards and research and travel grants also identified scientists of all career levels who have contributed to Australian science in outstanding ways.

In 2020 we welcomed the commitment of five years of STEM education funding support from the Australian Government, allowing us to progress important work supporting science teaching and learning across Australia and connecting schools with valuable and stimulating curriculum-aligned resources.

The Academy also continued efforts to improve diversity and inclusion within the Fellowship and across the science sector, carefully monitoring the impact of the pandemic on early- and mid- career researchers and on women in STEM, and providing support and opportunities during the year.

The Academy's work could not be achieved if it weren't for our exceptional partners and donors. We thank you for choosing to support science in Australia.

Professor John Shine AC PresAA FRS

CHIEF EXECUTIVE'S REPORT



I am pleased to present the Australian Academy of Science Annual Report for 2020.

2020 was an extraordinary year for society and for science. The Academy demonstrated its strength and relevance in guiding decision-making and we were able to reinforce the importance of the Academy's independent voice for science in Australia.

One of the year's most important achievements was the establishment of the Rapid Research Information Forum which became a trusted avenue for the provision of scientific evidence to inform decision-making directly to government on pandemic-related matters. This provides a model for providing independent advice to government to inform their decisions on a range of policy issues in the future.

The Academy's 22 National Committees progressed important work to guide scientific disciplines throughout the year, maintaining important collaborations nationally and internationally as we all navigated uncharted waters. Equally, Future Earth Australia and Taxonomy Australia continued their important work in sustainability and biodiversity.

Although our annual event, Science at the Shine Dome, was by necessity postponed, we swiftly moved most events online to ensure that our community could continue to connect to experts and learn from each other. This proved invaluable to communicating science in an accessible way to the public as they sought to understand complex questions triggered by the pandemic. In doing so, we were able to attract new, large and diverse audiences to a range of other activities including Falling Walls Lab Australia to support young entrepreneurs, celebrations of National Science Week and NAIDOC Week. The Academy also partnered with the Department of Industry, Science, Energy and Resources to deliver a series of international COVID-19 webinars allowing us to keep connected with our extensive international network.

The Academy's communications capability continued its success in 2020, enabling the expertise and independent voice of our Fellows to reach the public via the mainstream media and our growing social media audience. Importantly, this capability has allowed the public to reach truth in a sea of misinformation. Internationally, we forged a partnership with the International Science Council to provide a communication channel for the extraordinary expertise that resides among learned academies and other science organisations worldwide. Through analysis of Australian media reports in June, the Australian Science Media Centre revealed that the Academy was among the top 10 most prominent institutions in the pandemic, illustrating the vital role experts play in building public confidence.

The Academy continued its work to maximise the research workforce by implementing initiatives that remove barriers to participation and so enabling Australia to access all of the available STEM talent. This work has been guided by the Women in STEM Decadal Plan which provides a framework to achieve gender equity by 2030, as well as through input by our 6000+ early- and mid-career researchers who comprise the EMCR Forum. The success of the Science in Australia Gender Equity (SAGE) pilot delivered in partnership with the Australian Academy of Technology and Engineering allowed SAGE to be established as an independent entity. The Academy Council members took the Panel Pledge utilising their leadership role to encourage more equitable and inclusive practices in the STEM sector.

After the January hailstorm rendered our headquarters at Ian Potter House inoperable and damaged the copper tiles and skylights of the iconic Shine Dome, work began in October to repair the buildings. Today the Shine Dome's new copper roof shimmers brighter and stronger than ever, a symbol of our resilience through a challenging year. We look forward to welcoming Fellows and friends of the Academy back to the Shine Dome and Ian Potter House in 2021.

I am immensely proud of the Academy's work, made possible by the guidance and support of our Fellows and the generosity of our donors. We thank Fellows for generously giving their expertise and time to the Academy and recognise that their contribution to the pandemic response has been nothing short of extraordinary.

I also thank Academy staff whose professionalism and commitment inspire me daily.

The bushfires, hailstorm and the pandemic have shown that when confronted by crises, the science sector is resilient, able and generous.

This report provides an overview of the Academy's work in 2020, with more in-depth information about the impact and details of our work available on our website. I hope you enjoy reading it.

Anna-Maria Arabia

STRATEGIC PLAN 2018–2022



OBJECTIVES

- | | | | | |
|--|--|--|--|---|
| <p>INFLUENTIAL VOICE</p> <p>Be deeply influential in setting Australia's science agenda</p> <p>Be a trusted independent advisor on scientific matters</p> | <p>INTERNATIONAL ENGAGEMENT</p> <p>Be a leader in the international science academy network</p> | <p>SCIENTIFIC LITERACY</p> <p>Deliver innovative education programs at scale and with impact</p> <p>Enable a better-informed public that values science</p> | <p>EXCELLENCE AND DIVERSITY</p> <p>Be a national leader in diversity, equity and inclusion in the science sector</p> <p>Empower the next generation of scientists</p> | <p>OPERATIONAL EXCELLENCE</p> <p>Ensure long-term sustainability and financial viability along with the highest standards of professionalism</p> |
|--|--|--|--|---|

2020 HIGHLIGHTS

The Academy created a COVID-19 news and resources hub and focused strongly on supporting Australia's response to the pandemic by:



RAPID RESEARCH INFORMATION FORUM

Providing leadership and operational support for the Rapid Research Information Forum (RRIF), contributing to and publishing 13 expert reports based on the best available evidence



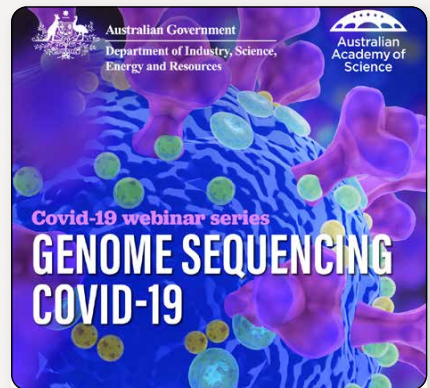
Feeling anxious about home schooling?

Developing and adapting education resources for teachers, parents and students to support emergency remote teaching

Creating the COVID-19 public database to enable access to more than 1800 experts across relevant disciplines

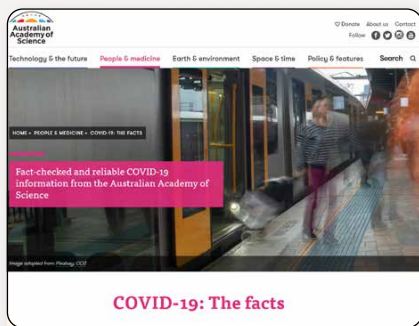


COVID-19 EXPERT DATABASE
EVIDENCE TO DRIVE DECISIONS
#COVID19Experts



Covid-19 webinar series GENOME SEQUENCING COVID-19

Commencing a series of international webinars on COVID-19 in collaboration with the Department of Industry, Science, Energy and Resources



COVID-19: The facts

Publishing 43 videos and 6 articles explaining the science of the pandemic to a broad audience on social media, and freely sharing them with mainstream media

Initiating Global Science TV in partnership with the International Science Council, producing videos on the pandemic and giving voice to global experts to help address the big questions



global science with NUALA HAFNER

At the same time, we responded to other major events by:



Producing a series of evidence briefs on the 2019–20 bushfires

Clearly stating the link between the frequency and intensity of extreme weather events and climate change



At least a billion animals killed in bushfires

Publishing multiple videos for a broad audience on climate science, bushfires and extreme weather



Statement regarding Australian bushfires
January 30, 2020



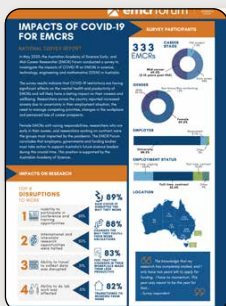
Providing advice to government inquiries and consultations, including appearing at parliamentary hearings

We supported scientists and encouraged diversity in science by:



Announcing 2 new career honorific awards to start in 2021

Awarding \$20,500 to 18 honorific awardees, and committing nearly \$360,000 to 21 research awardees, 2 conferences, 5 travelling fellowships and 1 prize



Holding 21 development and networking opportunities for early- and mid-career researchers and practitioners and recording how COVID-19 had affected them

FALLING WALLS LAB AUSTRALIA

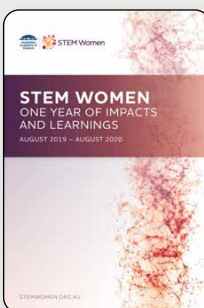
Hosting the finale of Falling Walls Lab Australia

Delivering 2 NAIDOC Week events



CATALYSING GENDER EQUITY 2020 BE PART OF THE SOLUTION

Hosting the Catalysing Gender Equity conference in collaboration with Science in Australia Gender Equity (SAGE)



Further developing the STEM Women online directory, connecting women to resources and opportunities

Welcoming new Women in STEM Decadal Plan champions

Supporting the Athena SWAN Awards and SAGE's transition to an independent organisation

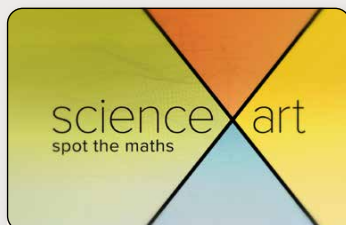
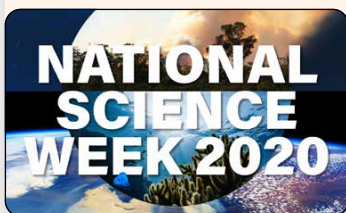
We brought science to a broad audience by:

Recording more than **95 million impressions** on social media | **95 MILLION**

Welcoming more than **5.4 million visitors** to our websites | **5.4 MILLION**

Publishing nearly **90 videos** that were **embedded in online mainstream media stories 732 times** and mentioned or **quoted 3489 times** including media syndications

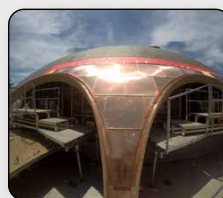
Developing the capability to deliver multiple online events, including 3 in National Science Week



Holding a photo competition for school students to 'spot the maths'

We responded to severe hail damage to our two historic buildings in Canberra by:

Saving our historic science archives from damage during the storm



Commencing the installation of a new copper roof on the Shine Dome and making the building more sustainable

Commencing roof replacement and renovation of Ian Potter House for better energy performance and access



Find out more about [what we did this year.](#)

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.

556 Fellows at 31 December	57 prestigious awards and honours received by Fellows
33 Corresponding Members	24 Fellows elected in 2020
	2 Corresponding Members admitted

2020 FELLOWS



Professor Tim Bedding FAA
Astrophysicist, University of Sydney



Professor Andrew Cuthbertson AO FAA FTSE FAHMS
Chief Scientific Officer and Director, CSL Limited (Special Election)



Dr Annabelle Bennett AC FAA
Chancellor, Bond University (Special Election)



Professor Aurore Delaigle FAA
Statistician, University of Melbourne



Associate Professor Lee Berger FAA
Biologist, University of Melbourne



Dr Cathy Foley FAA FTSE
Chief Scientist, CSIRO (Special Election)



Professor Linda Blackall FAA
Microbiologist, University of Melbourne



Professor Gary Froyland FAA
Mathematician (dynamical systems and optimisation), UNSW Sydney



Dr Wenju Cai FAA
Climatologist, CSIRO Oceans and Atmosphere



Professor Kevin Galvin FAA FTSE
Chemical engineer, University of Newcastle



Professor Peter Currie FAA
Stem cell biologist, Monash University



Professor Adèle Green AC FAA FAHMS
Epidemiologist, QIMR Berghofer Medical Research Institute



Professor Kate Jolliffe FAA
Organic chemist, University of Sydney



**Professor Robyn Anne Owens
FAA FTSE**
Mathematician (computer vision),
University of Western Australia



Professor Ping Koy Lam FAA
Quantum physicist,
Australian National University



Professor Ian Paulsen FAA
Microbiologist, Macquarie University



Professor Ryan Lister FAA
Epigeneticist,
University of Western Australia



Dr Simon Poole AO FAA FTSE
Director of Business Development,
Cylite Pty Ltd
(Special Election)



Professor Justin Marshall FAA
Marine biologist,
University of Queensland



**Professor Andrew Roberts
FAA FAHMS**
Clinical haematologist,
Walter and Eliza Hall Institute
of Medical Research



Professor Harvey Millar FAA
Plant biochemist,
University of Western Australia



Professor Alan Rowan FAA
Physical organic chemist,
University of Queensland



Professor Lidia Morawska FAA
Aerosol physicist,
Queensland University of Technology



Dr Jenny Stauber FAA FTSE
Ecotoxicologist,
CSIRO Land and Water

CORRESPONDING MEMBERS



Professor Jane Langdale FAA
Botanist, University of Oxford



**Professor Erwin Neher
FAA Nobel Laureate**
Biophysicist, Max Planck Institute
for Biophysical Chemistry

DECEASED FELLOWS AND CORRESPONDING MEMBERS



Professor Geoffrey Burnstock AC FAA FRS
10 May 1929 to 3 June 2020



Emeritus Professor Raymond Leslie Martin AO FAA FTSE FAIM FCS (Lond) FRACI
3 February 1926 to 25 February 2020



Professor Joseph (Joe) Hurd Connell FAA
5 October 1923 to 1 September 2020



Professor Lord Robert (Bob) McCredie May of Oxford OM AC FAA FRS FTSE FRSN
8 January 1936 to 28 April 2020



Professor Sir Vaughan Frederick Randal Jones KNZM FAA FRS NAS Hon FRSNZ
31 December 1952 to 6 September 2020



Professor Mervyn Silas Paterson FAA
7 March 1925 to 4 June 2020



Professor Ian Reay Mackay AM FAA FRACP FRCP FRCPA
22 March 1922 to 24 March 2020



Emeritus Professor Richard Limon Stanton AO FAA DistFRSN
16 February 1926 to 25 August 2020



Emeritus Professor Lewis (Lew) Norman Mander AC FAA FRS Hon FRSNZ
8 September 1939 to 8 February 2020



Professor Robert Gerard 'Gerry' Wake FAA
8 August 1933 to 26 January 2020

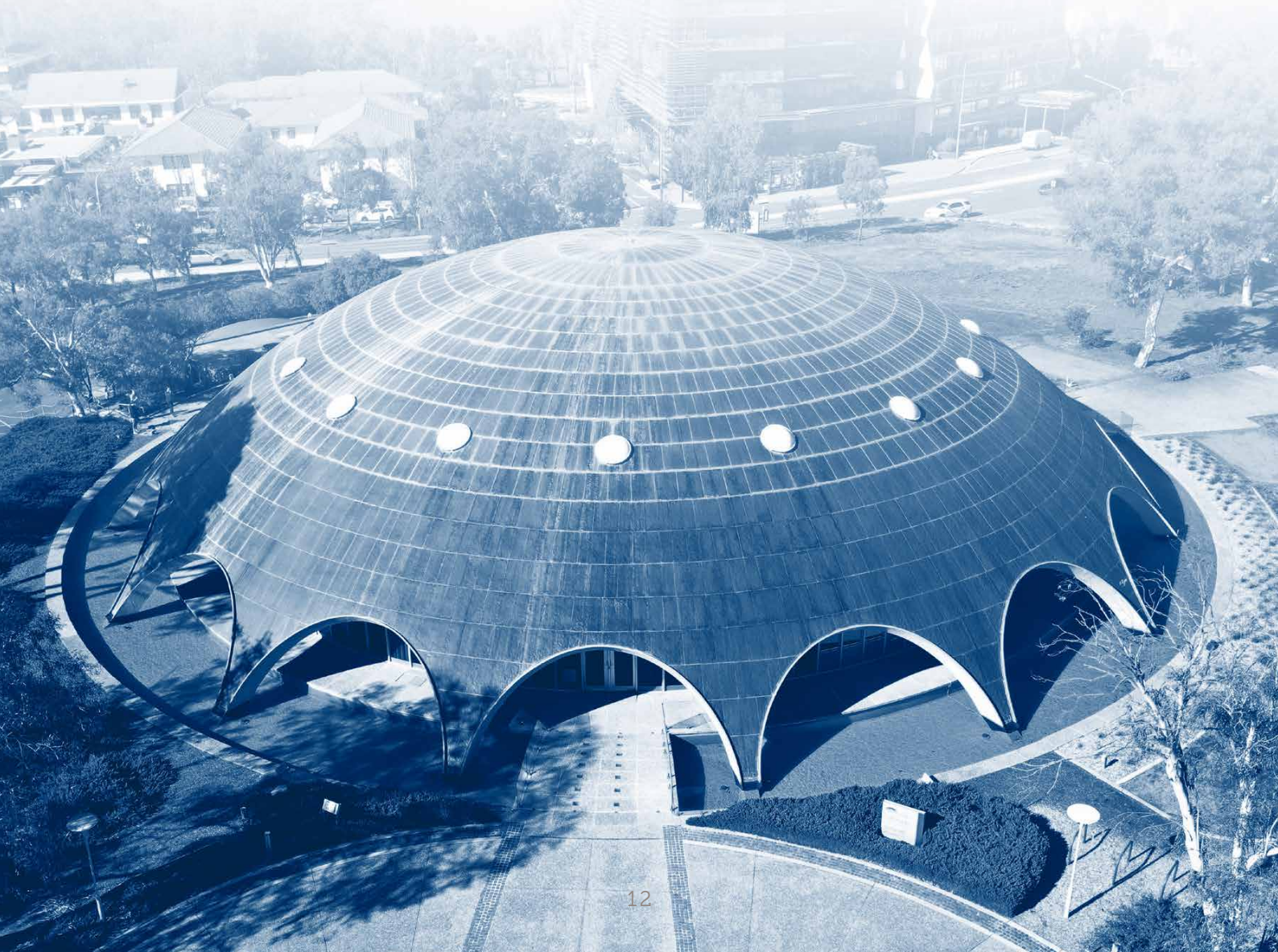
FELLOWS ARE THE ACADEMY

and enable it to speak with an independent voice.

Their expertise is generously offered to place science at the service of the nation and they underpin Academy activities, including:

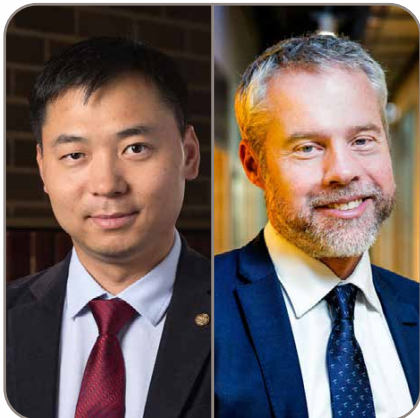
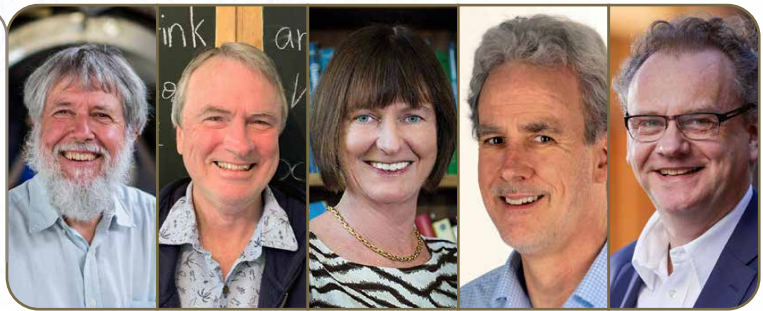
- policy submissions and reports
- National Committees for Science
- international meetings and collaborations
- awards committees
- sectional committees for assessing candidates nominated for Fellowship
- media participation
- video and article reviewers and expert interviewees
- symposium and online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

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



HONOURS AND AWARDS TO FELLOWS

Prime Minister's Prizes for Science— **Emeritus Professor David Blair**, **Professor David McClelland** and **Professor Susan Scott**, with their colleague **Professor Peter Veitch**, were jointly awarded the Prime Minister's Prize for Science for their significant contribution to the first direct detection of gravitational waves, while Academy Fellow **Professor Thomas Maschmeyer** was awarded the Prime Minister's Prize for Innovation.



Eureka Prizes—**Professor Dacheng Tao** won the Eureka Prize for Excellence in Data Science; **Professor Ben Eggleton** and his team won the Eureka Prize for Outstanding Science in Safeguarding Australia

Professor Lisa Kewley— awarded the 2020 James Craig Watson Medal by the National Academy of Sciences in the United States for her pioneering contributions to the study of galaxy formation and evolution. She is the first person in the Southern Hemisphere to be recognised with the major US award in its 133-year history.

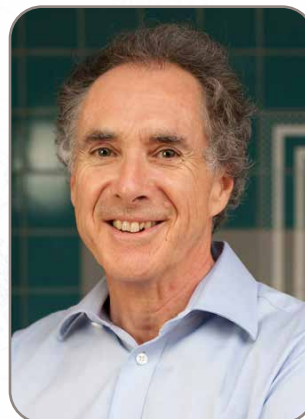


NSW Premier's Prizes—**Professor Edward Holmes** named the 2020 NSW Scientist of the Year; **Professor Suzanne O'Reilly** received the Prize for Excellence in Mathematics, Earth Sciences, Chemistry or Physics; **Professor Ian Wright** received the Prize for Excellence in Biological Sciences.

Professor Hugh Possingham—Appointed Queensland Chief Scientist



Professor Mark Randolph— inducted into the WA Science Hall of Fame



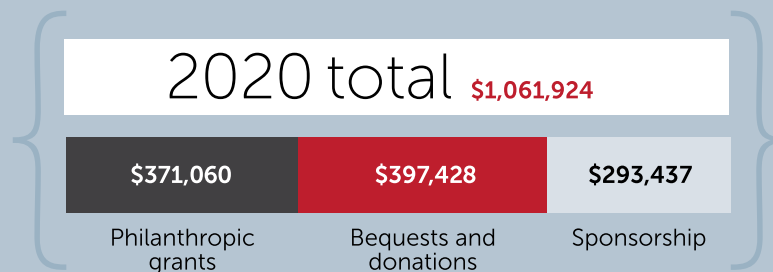
LIST OF ALL HONOURS AND AWARDS

Name	Award Name
Professor Perry Bartlett AO FAA	Order of Australia: Officer in the General Division
Professor Rob Baxter AM FAA	Order of Australia: Member in the General Division
Emeritus Professor David Blair FAA	Prime Minister's Prize for Science
Professor Richard Bryant AC FAA FAHMS FASSA	Royal Society of NSW, James Cook Medal
Professor Susan Clark FAA FAHMS	Australian Academy of Health and Medical Sciences, Fellow
Professor Marcello Costa AO FAA	Order of Australia: Officer in the General Division
Professor Alan Cowman AC FAA FRS	Royal Society of Edinburgh, Corresponding member
Professor Ben Eggleton FAA FTSE	Eureka Prize, DST, Outstanding Science in Safeguarding Australia
Professor Jane Elith FAA	National Academy of Sciences (USA), International Member
Professor John Endler FAA FRS	Royal Society of London, Fellow
Professor Matthew England FAA	Australian Meteorological and Oceanographic Society, Morton Medal
Dr Cathy Foley AO FAA FTSE	Australian Institute of Physics, Honorary Fellow
Dr Cathy Foley AO FAA FTSE	Order of Australia: Officer in the General Division
Professor Tony Guttman FAA FTSE	Order of Australia: Member in the General Division
Dr TJ Higgins AO FAA FTSE	American Association for the Advancement of Science, Fellow
Professor Doug Hilton AO FAA FTSE FAHMS	Melburnian of the Year
Professor Andrew Holmes AC FAA FTSE FRS	Honorary Doctor of Science, Curtin University
Professor Eddie Holmes FAA FRS	NSW Scientist of the Year
Professor Chennupati Jagadish AC FAA FTSE	National Academy of Engineering (USA), International Member
Professor Chennupati Jagadish AC FAA FTSE	National Academy of Sciences of India, Foreign Fellow
Professor David James FAA	ARC Australian Laureate Fellowship
Professor Nalini Joshi AO FAA	Australian Mathematical Society, George Szekeres Medal
Professor Lisa Kewley FAA	National Academy of Sciences (USA), James Craig Watson Medal
Professor Ryan Lister FAA	WA Scientist of the Year
Professor Trevor Lithgow FAA	Australian Society for Biochemistry and Molecular Biology, Lemberg Medal
Professor Melissa Little FAA FAHMS	Lorne Genome Conference Julian Wells Medal
Professor Justin Marshall FAA	Rank Prize (UK)
Professor Thomas Maschmeyer FAA FTSE	Prime Minister's Science Prize for Innovation
Professor David McClelland FAA	Prime Minister's Prize for Science
Professor Harvey Millar FAA	ARC Australian Laureate Fellowship
Professor Suzanne O'Reilly AM FAA	NSW Premier's Prize for Excellence in Mathematics, Earth Sciences, Chemistry and Physics
Professor Stephen Powles FAA FTSE	BASF Industry Recognition Award
Professor Mark Randolph AO FAA FTSE FRS	WA Premier's Science Awards: Hall of Fame Inductee

Name	Award Name
Professor Marilyn Renfree AO FAA	Marshall Medal, Society for Reproduction and Fertility, UK
Professor Andrew Roberts AM FAA FAHMS	Order of Australia: Member in the General Division
Professor Susan Scott FAA	Prime Minister's Prize for Science
Professor Susan Scott FAA	American Physical Society, Fellow
Professor Susan Scott FAA	Dirac Medal, UNSW
Professor John Shine AC PresAA FAHMS(Hon) FRS	Royal Society of London, Fellow
Dr Surinder Singh FAA FTSE	AAOCS Award for Scientific Excellence in Lipid Research
Professor Martina Stenzel FAA	ARC Australian Laureate Fellowship
Professor Bruce Stillman AO FAA FRS	Dr H P Heineken Prize for Biochemistry and Biophysics, Amsterdam
Dr Roger Summons FAA FRS	National Academy of Sciences (USA), Member
Professor Terry Tao FAA FRS	Princess of Asturias Award for Technical and Scientific Research
Professor Dacheng Tao FAA	Eureka Prize, UTS, Excellence in Data Science
Professor Anthony Thomas AC FAA	Order of Australia: Companion in the General Division
Professor Carola Vinuesa FAA FAHMS	Australian Academy of Health and Medical Sciences, Fellow
Professor Peter Visscher FAA FRS	European Molecular Biology Organization, Associate Member
Professor Jane Visvader FAA FAHMS FRS	Royal Society of London, Fellow
Dr Brian Walker AO FAA FTSE	Order of Australia: Officer in the General Division
Professor Toby Walsh FAA	ARC Australian Laureate Fellowship
Professor Toby Walsh FAA	American Association for the Advancement of Science, Fellow
Professor Ole Warnaar FAA	Australian Mathematical Society, George Szekeres Medal
Professor Rachel Webster AO FAA	Order of Australia: Officer in the General Division
Professor Robyn Williams AO FAA	Order of Australia: Officer in the General Division
Professor Naomi Wray FAA FAHMS	Australian Academy of Health and Medical Sciences, Fellow
Professor Ian Wright FAA	NSW Premier's Prize for Excellence in Biological Sciences

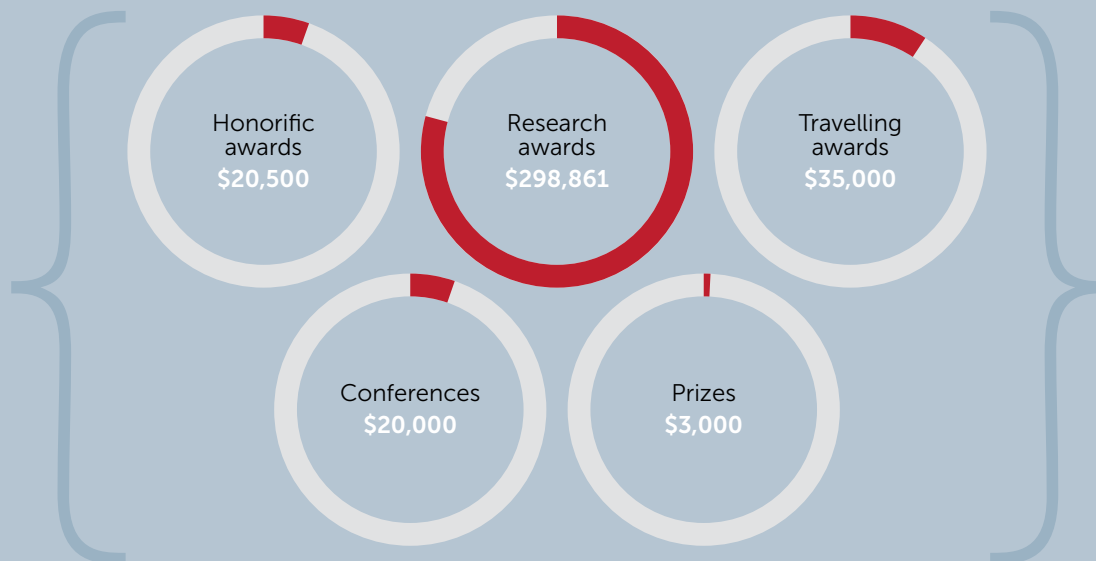
PHILANTHROPY AND PARTNERSHIPS

Philanthropy and partnership income



Academy support for awards

2020 total **\$377,361**



Other philanthropic activities of the Academy include funding of projects, lectures, discussions, meetings and administration costs.

DONATIONS AND IMPACTS

Many of the Academy’s core activities—such as scientific meetings, advice to support policy development, publications and videos, education, public awareness and outreach, international activities, awards and fellowships—would not be possible without the support of donors. The Academy thanks all donors for their support.



PROFESSOR MICHAEL BARBER’S DONATION SET TO CHANGE LIVES

A generous donation by Academy Fellow Professor Michael Barber made a difference to the career trajectory of young or emerging scientists by enabling the Academy to engage two science policy interns in 2020. He also pledged a further donation for the following financial year.

Professor Barber, whose donation of \$25,000 is being applied in the 2020–21 financial year, hopes that the internships will provide policy, political and social insight and networking opportunities for talented scientists who are keen to understand the broader context in which science operates. He also hopes that his donation will inspire others to support the valuable work of the Academy.

“The Academy thanks Professor Barber for being among the visionary Australians who recognise and support our work. With his help the Academy is providing evidence to inform decision-making at the highest levels to improve our national wellbeing and provide strong national leadership to build a society that is guided by and enjoys the benefits of science.”

— Anna-Maria Arabia, Chief Executive, Australian Academy of Science

GIFT TO THE ACADEMY CELEBRATES THE LIFE AND WORK OF PROFESSOR SALLY SMITH

Academy Fellow Professor Andrew Smith recently made a donation in memory of his wife Professor Sally Smith to support two existing Academy awards for PhD students and early- to mid-career researchers. The awards are the Aboriginal and Torres Strait Islander Scientist Award and the Max Day Environmental Science Fellowship Award.

The family decided that these awards fit well with Sally’s ongoing commitment to train and mentor young scientists as they seek to develop their research careers, and to the importance of travel to establish links in research.



ACKNOWLEDGEMENT OF DONORS

The Academy is deeply grateful to the following individuals and organisations for their extraordinary generosity. The Academy Pillars have, over time, contributed an outstanding level of support to the Australian Academy of Science.

Academy Pillars

Donations of or valued at \$500,000 +

In perpetuity

- Sir Jack Ellerton Becker FAA
- Estate of Thomas Lewis Davies
- Department of Communications, Information Technology and the Arts
- FJ Fenner AC CMG MBE FAA FRS and Mrs Bobbie Fenner
- Dr Margaret Middleton
- The Royal Society (UK)—Theo Murphy (Australia) Fund
- Estate of Ian Gordon Ross AO FAA
- Estate of Miss JG Russell
- Professor John Shine AC FAA
- Telstra Foundation
- Professor G W Kenneth Cavill Bequest

The Academy acknowledges the support of donors who gave generously in 2020. Their support plays a critical role in helping the Academy achieve its mission.

President's Circle

Donations of or valued at \$100,000 – \$499,999

- Dr Anna Rickards
- Minderoo Foundation
- Anonymous donors (2)

Science Circle

Donations of or valued at \$20,000 – \$99,999

- 3M Australia and New Zealand and 3M Foundation
- Professor Michael Barber AO FAA FTSE
- Estate of Professor David Curtis AC FAA FRACP FRS
- Jon Day
- The Finkel Foundation
- In Memory of Ruth Stephens-Gani
- Doug Hooley PSM
- In Memory of Sarah (Sally) Smith FAA
- Anonymous donor (1)

[See all Academy donors](#)

PARTNERSHIPS

Scientific collaborations find solutions to major global problems and enhance economic productivity and competitiveness through innovation. By strengthening regional and global links in science, technology, engineering and mathematics (STEM), Australia is contributing to the development of solutions to global challenges and benefiting from knowledge to solve challenges.

The Academy works with organisations in Australia and overseas to promote, support and encourage STEM. It seeks innovative collaborations with government bodies and organisations that share its commitment to scientific excellence.

Academy partners enable the delivery of independent, evidence-based and practical advice, programs and outreach. The broad work of the Academy may be supported, or a specific activity can be supported by partners.

The Academy gratefully acknowledges the support provided by partners, sponsors and donors.

RESEARCH FOCUS

The Academy’s [Research Focus](#) series, initiated in 2020, creates unique digital video content to showcase the depth and breadth of Australian research that is sometimes less visible to the public and decision-makers. The benefits of sharing research include the potential for further support and funding, and to encourage better understanding within the community about the benefits of public investment in research.

Along with its highly professional video production capability, the Academy has more than 2.4 million followers on social media—one of the largest social media followings of any Australian science organisation. It produces accurate, trusted and engaging science content that is read and shared by millions across the globe, and Research Focus partners are able to tap into our extensive network.

In 2020, the Academy partnered with the following organisations to create fascinating and engaging Research Focus videos:

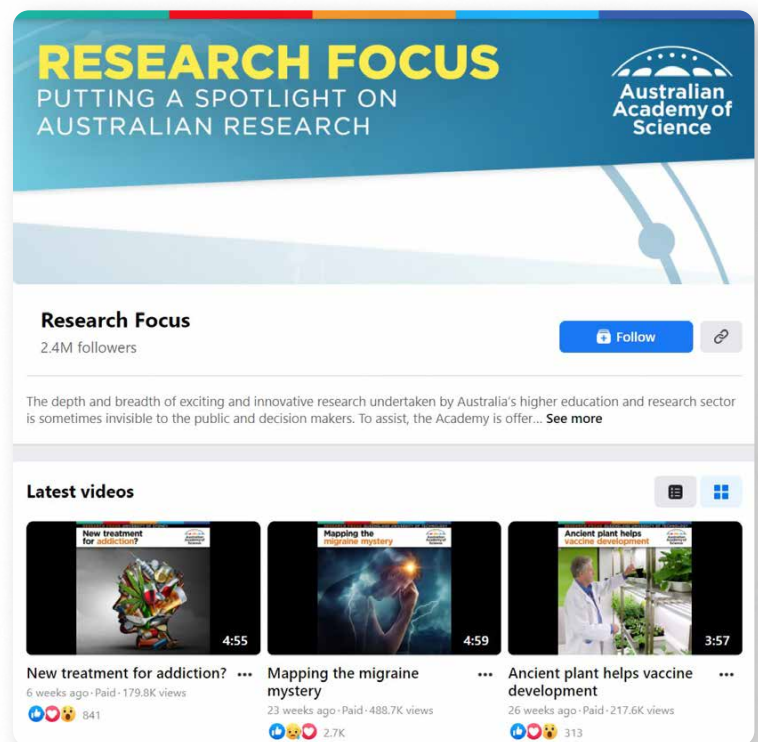
ARC Centre of Excellence for Translational Photosynthesis

- [Seeing the light: Better plants, better future](#)—The centre has made significant progress towards developing crops that enhance growth and yield, including new research on improving photosynthesis to increase crop yields.

University of Sydney

- [New treatment for addiction?](#)—Associate Professor Michael Bowen and his colleagues have developed a new drug which mimics the effects of oxytocin to treat addiction and social disorders and are gearing up to start human trials this year.

The videos are also published on the Academy’s Facebook and YouTube channels. Find out more about [partnered video content](#).



Queensland University of Technology

- [Mapping the migraine mystery](#)—Migraine is one of the leading causes of disability in the world. QUT researchers are involved in research which aims to identify which genes play a role in the debilitating illness.
- [Ancient plant helps vaccine development](#)—QUT scientists have sequenced the genome of an ancient Australian tobacco plant that helps develop vaccines and they’re sharing it with researchers around the world to aid the COVID-19 vaccine development effort.

The national Catalysing Gender Equity Conference brought STEM leaders together to achieve change.

CATALYSING GENDER EQUITY CONFERENCE

Guided by the Women in STEM Decadal Plan, this [two-day conference](#) featured representatives from across higher education and research, industry, education and government. They celebrated success, showcased impact and growth potential, highlighted key action areas and fostered collaboration to achieve change. Thank you to the following Event Partners: the **Australian Government Department of Defence, Edith Cowan University, Flamingo Ai, UniBank and Queensland University of Technology.**



Member of the Academy's Equity and Diversity Reference Group, Professor Halina Rubensztein-Dunlop, welcomes participants to the event



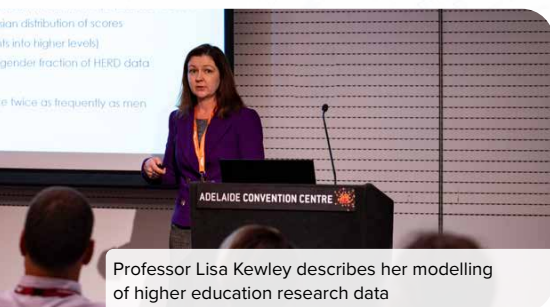
Australian Government Women in STEM Ambassador, Professor Lisa Harvey-Smith, delivers the plenary session, Change is a verb



Anna-Maria Arabia leads a panel discussion on the experiences of eminent women in STEM



STEM Women Changemaker, Dr Emma Camp, highlights her experience as an early-career researcher



Professor Lisa Kewley describes her modelling of higher education research data

PARTNERSHIP SUPPORT

3M partnership stands true through pandemic

Global industry leader 3M demonstrated its commitment to supporting STEM in Australia during COVID-19 by continuing to provide funding support to the Academy in partnership despite the cancellation of planned events and activities.

"We are proud to be able to support the Academy with this flexibility in use of the grant and funding. I hope that this outcome will support your team while focusing on ramping up to better days on the other side of this COVID-19 pandemic."

— Chris LeBlanc, Managing Director, 3M Australia

QUT honoured 2020 event partnership despite cancellation

Queensland University of Technology (QUT) honoured its event partnership collaboration with the Academy's Science at the Shine Dome, despite the event being cancelled due to the pandemic. QUT's unwavering support will be recognised in the long term and transferred into 2021 as a Major Partner of the Science at the Shine Dome 2021 event series.

Eucalypt Australia embarks on first education digital video content in partnership

Grant-making charitable trust, Eucalypt Australia, extended its collaboration with the Academy in 2020 by developing a partnered educational video resource to support teachers to deliver engaging STEM education. The resource was scheduled for release on 23 March 2021, National Eucalypt Day.

Department of Defence reaches out to Academy

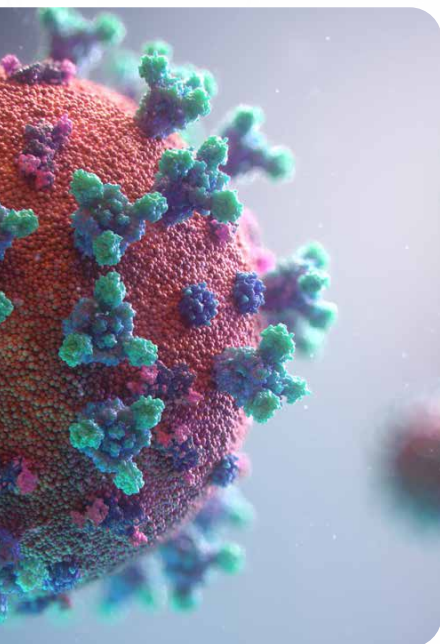
The Australian Government Department of Defence Science and Technology Group (DSTG) and the Academy are collaborating in a partnership to support public awareness and understanding of STEM in Australia. The organisations share aspirations and a mutual commitment to encourage the future of Australian STEM and workforce diversity that supports Australia's emerging strategic challenges.

In 2020 the Academy conducted an independent review of DSTG's participation in the Defence STEM Cadetship program. The project also made suggestions for the evaluation of STEM recruitment. In addition, the Academy produced a series of digital webinars to support DSTG online educational events as part of National Science Week 2020 and the theme 'Deep Blue Oceans'. The series was managed and distributed by the Department and the Academy through its education program Primary Connections.

INTERNATIONAL

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.

Although COVID-19 had an impact on the international activities of the Academy, we continued to actively engage with international partners via virtual meetings, conferences and webinars. Fellows of the Academy contributed expertise on international working groups that produced important statements and international surveys on matters of global interest. The international programs continued to support early- and mid-career researchers as described below.



COVID-19

The Academy supported the S20 [statement to G20 leaders](#) on COVID-19, and the InterAcademy Partnership statements for [global solidarity](#) during and a [green recovery](#) after the pandemic. We joined with 17 other academies of the Commonwealth to call on governments to ensure a [sustainable recovery](#) from the COVID-19 pandemic.

The Academy also supported a [statement from the S20](#) outlining emerging critical challenges in health, the environment and technology, highlighted by the very real occurrence of the globally disruptive coronavirus pandemic. The recommendations in the S20 statement covered topics including pandemics, the emerging digital divide, circular economy systems, and renewables aimed at net zero carbon emissions.

On behalf of the Department of Industry, Science, Energy and Resources, the Academy managed the call for the [Regional Collaborations Programme COVID-19 Digital Grants](#). Grants of up to \$10,000 were available to support digital collaborative research projects with Asia–Pacific regional partner economies for Australian early- and mid-career researchers, with recipients announced in early 2021.

INTERNATIONAL WEBINARS

UNDER THE MICROSCOPE: WHAT IF WE CANNOT FIND A VACCINE?

A webinar titled [Under the Microscope](#) was held in June by the Australian Embassy Berlin, the German Embassy Canberra, the Australia-Germany Research Network (AGRN) and the Academy. The webinar featured Professor Doctor Marylyn Addo, head of infectious disease at the University Medical Center Hamburg-Eppendorf, Germany, and Academy Fellow and patron of the Doherty Institute, Nobel Laureate Professor Peter Doherty. They discussed the possibility of developing a vaccine, and the importance of developing treatments for the disease.



IMPACTING SCIENCE FROM A SMALL COUNTRY— Q&A WITH NOBEL PRIZE LAUREATE

In July, the Academy teamed up with Technion Australia and the Embassy of Israel Canberra for a [fascinating insight](#) into a small country with a big scientific impact. Academy Chief Executive Anna-Maria Arabia talked with Professor Aaron Ciechanover, one of the team who received a Nobel Prize in Chemistry for their discovery that has transformed the way cancer and other degenerative diseases are treated.

OPPORTUNITIES FOR SCIENTISTS

FALLING WALLS LAB AUSTRALIA

Environmental geochemist Dr Jessica Hamilton from ANSTO won the fifth [Falling Walls Lab Australia](#) event, hosted online by the Academy in partnership with the Embassy of the Federal Republic of Germany in Canberra and EURAXESS Australia and New Zealand. Second place was awarded to Alan Robertson from ClearSky Genomics, while Andrew Law from the Garvan Institute of Medical Research took third place and Dr Dashen Dong from RMIT won the People’s Choice.

The event featured 10 contestants from across Australia presenting their ideas, research and initiatives on the theme ‘Which walls will fall next?’. The Academy made professional videos of the winners that were shown at Falling Walls Berlin and shared widely on social media.

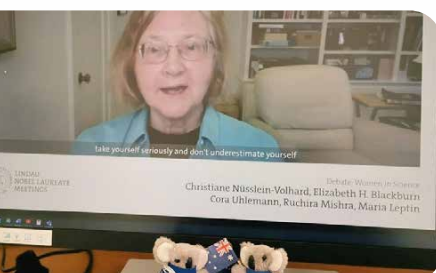


Top to bottom: first place winner Dr Jessica Hamilton, second place winner Mr Alan Robertson, third place winner Mr Andrew Law, People’s Choice winner Dr Dashen Dong.

LINDAU NOBEL LAUREATE MEETINGS

Eleven Australian early-career researchers were selected as Young Scientists to attend the [Lindau Nobel Laureates Meeting](#) in Lindau, Germany. With the in-person meeting postponed to 2021, they attended the Lindau Online Science Days and a hackathon-style online Sciathon.

Nobel Laureate and Academy Fellow, Professor Elizabeth Blackburn, shares advice during the Online Science Days. Credit: Wenyue Zou.



“My favourite aspect of the entire experience was that I was able to make connections with scientists around the world regardless of time zones and technology. This has made me so excited for to see what can happen when we meet in person next year.”

– Lindau participant Ms Nicole Foster, University of Adelaide

The researchers were:

Dr Ifrah Abdullahi from La Trobe University, who investigates neurodevelopmental disorders in migrant and refugee communities

Ms Nicole Foster from the University of Adelaide, who develops tools for the management and restoration of coastal plant communities facing climate change

Dr Emily Kerr from Deakin University Institute for Frontier Materials, who works on platforms for the diagnosis and management of chronic kidney disease

Dr David Klyne from the University of Queensland, whose research in neuro-immunology focuses on understanding acute to chronic pain

Ms W. Y. Sarah Lau from the ARC Centre of Excellence for Engineered Quantum Systems, who studies quantum technologies for secure communication channels

Mr Lukas Michalek from Queensland University of Technology, whose research focuses on the surface characterisation of soft matter

Dr Derrick Roberts from the University of Sydney, who studies self-assembling molecular structures.

Dr Yauhen (Eugene) Sachkou from the ARC Centre of Excellence for Engineered Quantum Systems, who researches superconducting circuits, quantum fluids and optomechanics

Ms Kate Secombe from the University of Adelaide, who specialises in gastrointestinal physiology and oncology

Mr Adam Sutton from the University of South Australia, who specialises in green analytical chemistry applicable to fields such as nanotechnology

Dr Wenyue Zou from RMIT University, who focuses on applied chemistry research with applications such as sensor technologies



Australian delegate Dr Eugene Sachkou after the announcement of the Sciathon results in the Communicating Climate Change. Photo: Eugene Sachkou.



ASPIRE PRIZE NOMINEE

Australia's [2020 APEC Aspire Prize nominee](#) was **Dr Amelia Wenger**, a marine conservationist from the University of Queensland. Dr Amelia Wenger was one of 12 international nominees in the running for the prestigious Asia–Pacific region science prize. She collaborates with communities and researchers to produce knowledge and tools for conserving marine ecosystems, producing tangible outcomes for both biodiversity and economies.

The Academy congratulates the recipient of the 2020 ASPIRE Prize, Dr Huai Chen from China, who specialises in the research of wetland biodiversity and nature's contribution to people.

SUPPORT FOR INTERNATIONAL SCIENCE COLLABORATIONS

MULTILATERAL RELATIONS

The Academy actively participated in matters related to the InterAcademy Partnership (IAP). The IAP has more than 140 national, regional and global member academies that work together to support the vital role of science in seeking evidence-based solutions to the world's most challenging problems. During the year, the Academy nominated a number of Fellows to working groups that produced statements on topics such as the protection of marine environments.

The Academy is an active member of the Association of Academies of Sciences in Asia (AASSA). Academy Fellow, Professor Cheryl Praeger, is chair of the AASSA special committee on Women in STEM and is leading an AASSA project that is developing a STEM women in Asia database.

In October, Academy Fellow and former President Professor Andrew Holmes attended the Academy of Science Presidents' Meeting held at the 17th annual meeting of the Science and Technology in Society (STS) forum, supported by the Japanese Government.

FUNDING FOR COLLABORATIVE INTERNATIONAL RESEARCH

Regional Collaborations Programme

The Academy opened applications for the \$250,000 Regional Collaborations Programme in October. Grants of up to \$10,000 each were available to support digital collaborative research projects with Asia–Pacific regional partner economies for Australian early- and mid-career researchers. The aim is to support projects that utilise digital methods of collaboration to address shared regional challenges that either directly or indirectly relate to the COVID-19 pandemic response and recovery in the Asia–Pacific region.

This funding initiative is supported by the Department of Industry, Science, Energy and Resources and is part of the [Global Innovation Strategy](#) under the [National Innovation and Science Agenda](#).

Australia–India Strategic Research Fund (AISRF) Early- and Mid-Career Researcher (EMCR) Fellowships 2020

An Australian researcher and her colleagues are fostering a strategic approach to health care education and research capability between Australia and India with the support of an AISRF EMCR fellowship from the Academy. [Associate Professor Christina Aggar](#) was one of 19 recipients who received support of up to \$16,500 to travel to India and work with leading researchers at major Indian science and technology organisations for between one and three months. The total amount awarded across all recipients was nearly \$217,000.

As a number of researchers were impacted by COVID-19 restrictions, the Department of Industry, Science, Energy and Resources extended the travel completion deadline to 31 December 2021. Ten fellowship recipients are yet to travel and the extension deadline will be reviewed if travel restrictions are still in place towards the latter half of 2021.

Find out more about the [AISRF EMCR Fellowships 2020](#).

JSPS Postdoctoral Fellowship Program for Foreign Researchers 2020 - 2021

Following nominations by the Academy, 14 Australian EMCRs were awarded fellowships through the Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship Program for Foreign Researchers. The program aims to allow researchers to advance their own research while contributing to the advancement of research in Japan and Australia. The fellowships are for a period of 12 to 24 months. Fellowship recipients impacted by COVID-19 travel restrictions received extensions on their fellowship commencement deadline.

Find out more about the [JSPS fellowships](#).

INTERNATIONAL ACTIVITIES

The Academy interacted with the following countries:

- India, through the Australia–India Strategic Research Fund Early- and Mid-Career Researcher Fellowships 2020
- Japan, through the Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship Program for Foreign Researchers
- Saudi Arabia, through the S20, the national academies of science of G20 nations.
- China, through the Australia–China Science and Research Fund
- Brazil through the Australia–Americas PhD Research Internship Program
- Chile, Indonesia, Malaysia, Mexico, New Zealand, Taiwan and the United States, through the Regional Collaborations Programme

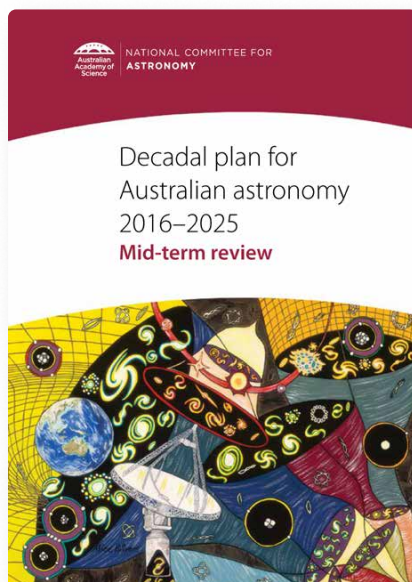
NATIONAL COMMITTEES FOR SCIENCE

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 31 international scientific unions and interdisciplinary scientific committees 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.

DECADAL AND STRATEGIC PLANS

The Academy, through the National Committee for Astronomy, [delivered a mid-term review of the Decadal Plan for Australian Astronomy](#). The review found that Australia's investment in astronomy and its hosting of two of the world's most powerful telescopes means it is well placed to contribute to more big international breakthroughs in our understanding of the universe. The review made nine major recommendations for the next five years and detailed the ongoing investment into major facilities and infrastructure required for Australian astronomers to continue to play world-leading roles.



National Committees also progressed the following plans:

- [Australia’s Future in Space: a strategic plan for space science](#)
- [Big data in Australian research: Issues, challenges and opportunities](#)
- [Physics decadal plan 2012-2021: Mid-term review](#)
- [Bioscience 2030: recommendations for future curriculum.](#)

SCIENCEART: SPOT THE MATHS

To celebrate mathematics and its prominence in science and society and to align with the International Mathematical Union’s Centennial, the Academy’s National Committee for Mathematical Sciences hosted ‘scienceXart: spot the maths’, a photographic competition for school students of all ages. This initiative was a collaboration between the committee and the Academy’s mathematics education program, reSolve, and was supported by the Australian Mathematical Society and the Statistical Society of Australia.

Almost 1000 entries from schools all over Australia were received.
[Read about the winners.](#)



CHANGES TO NATIONAL COMMITTEE CHAIRS

National Committee for Antarctic Science

- Outgoing chair: Professor Steven Chown
- New chair: Professor Nerilie Abram

National Committee for Nutrition

- Outgoing chair: Professor Mike Gidley
- New chair: Professor Helen Truby

National Committee for Physics

- Outgoing chair: Professor Ian McArthur
- New chair: Professor Halina Rubinsztein-Dunlop AO FAA

DEVELOPING SCIENCE DIPLOMACY AS A STRATEGIC NATIONAL CAPABILITY

The Academy is a champion, practitioner and proactive facilitator of science as a soft power asset through its global science linkages. To support the development of a coordinated program to establish and leverage science diplomacy as a national capability, the Academy identifies and scopes strategic opportunities to engage with the ISC and other international bodies, develops proposals to strength ties with DFAT, provides input into policy submissions and UN consultations (with input from ACIM and the National Committees) and produces the Science Policy and Diplomacy Newsletter.

Science Policy and Diplomacy Newsletter

The [Science Policy and Diplomacy Newsletter](#), launched in November 2019, highlighted important discussion about the science–policy interface during the height of the COVID-19 pandemic. The newsletter released three special editions in 2020, in addition to its regular issues that report on the involvement of science in international and Australian policy and science diplomacy, and the Academy’s contributions to these discussions.

AWARDS AND FUNDING

HONORIFIC AWARDS

18

HONORIFIC AWARDEES

4

CAREER AWARDS

2

MID-CAREER AWARDS

10

EARLY-CAREER AWARDS

2

Announced 2 new career awards to start in 2021

\$20,500

Awarded \$20,500 to 18 honorific awardees

\$360,000

Committed nearly \$360,000 to 21 research awardees, 2 conferences, 5 travelling fellowships and 1 prize



The 2020 honorific awardees

TWO NEW AWARDS

Two new career awards were announced in 2020



Ruby Payne-Scott Medal and Lecture for Women in Science
The Ruby Payne-Scott Medal and Lecture is a career medal that recognises researchers of the highest standing in the physical and/or biological sciences. Along with the Macfarlane Burnet and Matthew Flinders medals, it is one of the most prestigious career awards of the Academy and honours Ruby Payne-Scott's pioneering contribution to radiophysics and radio astronomy.



Suzanne Cory Medal
The Suzanne Cory Medal recognises outstanding research in all of the biological sciences, being awarded in alternate years in the bio-medical sciences and in all of the biological sciences excluding bio-medical sciences. It honours the contributions made to science by Professor Suzanne Cory AC FAA FRS who, as a molecular biologist, has made major contributions to understanding the genetic causes of cancer.

CAREER AWARDS

David Craig Medal and Lecture **Dr Graeme Moad, CSIRO**

Dr Graeme Moad is recognised as a world leader in the field of polymer chemistry. His achievements range from fundamental chemistry, in the areas of polymer design and synthesis, and polymerisation kinetics and mechanism, to new materials for industrial uses, nanotechnology, organic electronics and bioapplications. His research has contributed substantially to the development of new synthetic methods for the controlled synthesis of polymers with defined architecture and composition that have revolutionised the field and resulted in highly cited publications and patent applications.

Haddon Forrester King Medal and Lecture **Professor Ian Campbell, Australian National University**

Professor Ian Campbell is widely recognised internationally as one of the world's leading experts in ore deposit geology. After graduating from the University of Western Australia he spent three years working for Western Mining Corporation at Kambalda where he found the Juan Shoot, one of the richest nickel deposits in Western Australia. He has had a long and distinguished career in mineral exploration and research relating to the origin of magmatic sulfide deposits, particularly platinum group element (PGE) deposits, and later, porphyry copper deposits. His hypothesis for the origin of PGE deposits was initially controversial but recent experiments have confirmed its key predictions. Several of his projects have been directed at discriminating between economically mineralised and barren bodies of rocks; the outcomes of these projects have direct application in exploration.

Mawson Medal and Lecture **Professor Allen Nutman, University of Wollongong**

Professor Allen Nutman has made some fundamental discoveries concerning the evolution of early Earth,

through numerous field campaigns in arduous conditions. He has revolutionised our understanding of Greenland geology by applying necessary, detailed geological mapping and applying necessary geochronological dating obtained through state-of-the-art geochronological techniques which he personally obtained. He is considered to be one of the leaders in the understanding of early history of Earth. Professor Nutman also made significant contributions to ancient rocks through successful international collaboration.

Macfarlane Burnet Medal and Lecture **Professor Marilyn Renfree AO FAA, University of Melbourne**

Australia is home to a unique assembly of mammals—the marsupials and monotremes. Professor Marilyn Renfree has pioneered modern research on their reproduction, development, evolution, conservation, molecular and comparative genomics for 40 years, demonstrating their importance for biomedical research as well as providing novel conservation and management approaches for our iconic kangaroos and koalas. Her lifetime passion for these long-neglected Australian fauna has led to pioneering discoveries and insights that challenged assumptions and opened up new areas of biomedical research internationally. Professor Renfree's research program has advanced our understanding of embryonic development and placentation, how the development of their embryos can be suspended, and how their extraordinary lactation is controlled. Her most important contributions have been to the field of sexual differentiation, overturning established paradigms and showing how genes and hormones interact during early development, providing new understanding of what makes a male and a female mammal—leading to new clinical guidelines and making a contribution to our understanding of human sexual development as well as that of other mammals.

MID-CAREER AWARDS

Gustav Nossal Medal for Global Health Adjunct Professor Alexandra Martiniuk, University of Sydney

Professor Alexandra Martiniuk is a leader in global research in health systems in low- and middle-income countries (LMIC) and remote Indigenous communities in Australia and Canada. Alexandra uses her pioneering research to identify and deliver solutions to enable better access to primary health care for disadvantaged populations. She has shed light on inequalities and inefficiencies in models of funding between high-income countries and LMICs, enabling greater transparency and informed decision-making to build stronger health systems. Her innovative approach to solving global health problems, and her ability to partner with a wide spectrum of key stakeholders and work with the people on the ground have led to policy change for lay health workers in Malawi, revised referral practices in the Solomon Islands, a new educational approach to HIV prevention in all high schools in Belize, and co-development of a large primary care program for LMICs.

Nancy Millis Medal for Women in Science Associate Professor Kate Schroder, University of Queensland

Associate Professor Kate Schroder is an international leader in the field of inflammatory biology. Her innovative work is defining the molecular and cellular processes of inflammation. The protein complexes involved in inflammation and disease are known as inflammasomes. Her research has established that inflammasome signalling is crucial in antimicrobial defence and she has established that they drive pathological inflammation in diseases. Associate Professor Schroder's laboratory seeks to use the understanding of fundamental cellular processes to develop therapeutics for a wide range of inflammatory diseases. Small molecule inflammasome inhibitors co-invented by Associate Professor Schroder are currently under commercialisation as novel anti-inflammatory drugs.

Professor Nicole Bell, University of Melbourne
Professor Nicole Bell is an outstanding theoretical astroparticle physicist who has made significant contributions in the areas of dark matter and particle theory, matter-antimatter asymmetries and neutrino astrophysics and cosmology. Her work has helped shape the interpretation of Large Hadron Collider searches for dark matter, using physically self-consistent descriptions of dark matter interactions. She has explored the link between dark matter and matter-antimatter asymmetries and examined whether the accumulation of dark matter in old neutron stars can result in gravitational collapse to black holes. She has also used cosmology and astrophysics to constrain the properties of neutrinos and has examined whether dark matter annihilation can account for unexplained galactic gamma ray and antimatter signals.

EARLY-CAREER AWARDS

John Booker Medal Associate Professor Britta Bienen, University of Western Australia

Associate Professor Britta Bienen's world-leading research delivers innovative foundation solutions for the complex challenges associated with offshore oil and gas and renewable energy infrastructure. Through the development of practical predictive methods for soil-structure interaction problems, grounded in sound geotechnical science, her internationally recognised expertise translates scientific findings to significant impact in industry. Her major achievements include developing models that encapsulate foundation response in a way that is compatible with structural engineering and can be integrated into analysis software used by the majority of offshore engineers. This is critical for robust, reliable and cost-effective design of infrastructure one which the global energy supply depends. Her award-winning research on jack-up footing extraction has had marked impact in industry, enhancing safety of personnel and assets. Her contributions to this field are of major significance, have been incorporated in international industry guidelines and are of direct benefit to geotechnical practice in Australia and worldwide.

Fenner Medal Associate Professor Michael Bode, Queensland University of Technology

Associate Professor Michael Bode develops new mathematical theory and tools to better understand the Earth's threatened ecosystems to more effectively conserve them into the future. His work has repeatedly overturned established beliefs about the best solution to common conservation problems and has used mathematical logic to convince scientists and managers to re-think conservation dogma and decision-making approaches to conservation across the world, especially of coral reef ecosystems. His marine science work has focused on developing new statistical tools to measure dispersal patterns, and new mathematical theories to understand the implications of these patterns. These new mathematical tools have given coastal marine science the first solid empirical understanding of how larval dispersal varies across space and species and have been highlighted in critical reviews of the field.

Ruth Stephens Gani Medal Associate Professor Marina Pajic, Garvan Institute of Medical Research and UNSW Sydney

Pancreatic cancer has an almost uniformly dismal outcome for patients, with only 7% surviving longer than 5 years. The survival rate has remained low for decades, highlighting the urgent need for innovative translational research into this disease. Dr Pajic and her group utilise rapidly evolving genomic technologies, innovative models of disease and patient tumour specimens to improve our understanding of how cancers develop, spread to distant sites (metastasise), and why so many of them are heavily resistant to

treatment. This knowledge is used in turn to inform the design of novel, effective and personalised treatment options for pancreatic cancer, as well as other difficult-to-treat cancers, with the aim of patients getting the best treatment tailored based on the 'molecular fingerprint' of their tumour.

Gottschalk Medal

Associate Professor Muireann Irish,
University of Sydney

Dementia is one of the most pressing concerns for our aging society. Despite significant advances in dementia research, it remains challenging to accurately screen for subtle changes in behaviour and cognition at the earliest stages of the disease.

Dr Muireann Irish's research has systematically mapped how alterations in the brain's grey and white matter contribute to memory dysfunction across different dementia syndromes. Her ground-breaking work has further uncovered that in parallel with loss of memory for the past, individuals with dementia have marked difficulties thinking about the future. Dr Irish is now developing novel approaches to screen for the earliest signs of underlying brain pathology, long before overt signs of dementia emerge. Her research vision is to advance early detection and swift intervention in dementia to improve quality of life for all affected.

Anton Hales Medal

Dr Jan Zika, University of UNSW Sydney

Dr Jan Zika is an outstanding young physical oceanographer with a clear view of the role and importance of the ocean in the global climate system. He's revolutionised the quantitative approach to determining the ocean's circulation and mixing by reformulating the problem in water mass properties (rather than in fixed geographical coordinates). This resulted in improved understanding and more accurate estimates of the ocean's storage and transport of heat and freshwater.

Dr Zika's ideas have found direct application in understanding changes in global-scale atmospheric processes and in using ocean observations to more accurately quantify increases in the global hydrological cycle. The combination of Dr Zika's deep insight, record of innovation, leadership and collegial approach is being recognised globally.

Christopher Heyde Medal

Professor Ryan Loxton, Curtin University

Professor Ryan Loxton is pioneering new mathematical algorithms for optimising complex systems in a wide range of applications such as mining, robotics, agriculture, and industrial process control. Such systems are typically of enormous scale in practice, with hundreds of thousands of inter-related variables and constraints, multiple conflicting objectives, and numerous candidate solutions that can easily exceed the total number of atoms in the solar system, overwhelming even the fastest computers.

Professor Loxton's research provides new mathematical advances for overcoming this complexity

and deriving fast algorithms for real-world use. He has collaborated with many companies with his work leading to innovative mathematical techniques for solving real-world problems such as providing algorithms for an award-winning Quantum technology platform that optimises the sequence and timing of maintenance activities in mine plant shutdowns.

Dr Jennifer Flegg, University of Melbourne

Drug resistance is a growing issue for malaria control. Dr Jennifer Flegg develops predictive statistical models in space and time for the level of drug resistance. These predictive models fill in the gaps where no information is available on drug resistance and have been used by health agencies to develop new policies about where and when certain drugs are appropriate to use.

Dr Flegg also develops mathematical models to describe and help understand the ways that cells and chemicals interact with each other during the healing of a skin wound. By building models that simulate the successful healing of a wound, she provides biological insight into the underlying healing mechanisms. In the case when a wound would not heal without intervention, she uses her models to predict how treatments can help the wound to heal.

Dorothy Hill Medal

Dr Rebecca Carey, University of Tasmania

Dr Rebecca Carey is internationally recognised for her research in volcanology. She has contributed significantly to the understanding of eruption and hydrothermal processes on land and on the sea-floor. Her achievements in the field of submarine silicic volcanism include demonstration of the influence of confining pressure provided by overlying ocean in modifying the style of volcanic eruption on the seafloor, and pioneering quantification of volatile fluxes through the magma into the surrounding seafloor. Parallel work on basaltic volcanism has identified a previously unrecognised mechanism for explosive basaltic eruptions involving volatile supersaturation, bubble nucleation and explosive fragmentation, triggered by a compression-decompression wave within a shallow magma conduit, and the first quantification of the duration of magma convection using the microtextures of erupted clasts.

Pawsey Medal

Associate Professor Adam Deller, Swinburne University of Technology

Associate Professor Deller uses high angular resolution radio imaging to study neutron stars and black holes, the most compact objects in the Universe. To do so, he has developed new instrumentation capable of jointly processing signals from radio antennas spread across the Earth and even on orbiting satellites, which has been adopted by major astronomical facilities world-wide.

His own usage of these facilities has led to breakthroughs including a time-lapse movie of the high-speed material launched by merging neutron stars in a galaxy 125 million light years away, which

determined the orientation of the system first detected via the burst of gravitational waves emitted when they merged. Closer to home, he has pinpointed the location of neutron stars within the Milky Way galaxy with unprecedented precision, using radio observations so precise they could discern motion no greater than the width of a human hair at a distance of 2000 km.

Frederick White Medal

Professor Madhu Bhaskaran, RMIT University

Professor Madhu Bhaskaran is transforming how we imagine, use, and interact with electronic devices. Professor Bhaskaran's signature advance is in the field of stretchable electronics where she has developed techniques to stretch devices to an unprecedented level – allowing them to be worn on the skin. This has realised a range of visionary applications, such as skin-worn sensors that alert miners to dangerous gas levels, or warn civilians about harmful UV levels. Professor Bhaskaran is currently working with industry partners to bring these sensors out from the laboratory into everyday life. These are in the form of sensors in bedding products for aged care which would non-invasively track presence and biometrics of aged people during night.

Le Fèvre Medal

Associate Professor Ivan Kassal, University of Sydney

Associate Professor Ivan Kassal develops new theoretical and computational tools for simulating the dynamics of complex chemical systems, especially those where quantum effects make conventional calculations difficult and time consuming. He has designed algorithms that would allow future quantum computers to dramatically accelerate the simulation of chemical processes, as well as designing quantum simulators, purpose-built devices for solving particular difficult problems. His methods have been widely used and implemented experimentally, contributing to chemistry and materials science being recognised as the likely first applications of quantum computers. He has also studied the transport of energy and charge in disordered materials that lie at the boundary between quantum and classical behaviour, making them difficult to describe. Associate Professor Kassal's contributions have included explaining quantum effects in light harvesting (and how to engineer them to improve performance), discovering significant quantum effects in photosynthesis, and clarifying fundamental mechanisms of how organic solar cells operate.

GRANTS AND FUNDED AWARDS

Due to COVID-19 numerous research projects and travelling lectures were postponed with a general one-year extension granted when requested. These include the original planned tours of the 2019 Geoffrey Frew Fellow and 2021 Selby Travelling Fellow.

LECTURE TOURS ANNOUNCED IN 2020

2021 Geoffrey Frew Fellowship

Professor Ania Bleszynski Jayich

Optics and photonics

The Geoffrey Frew Fellowship was initiated in 1970 through a personal donation from Mr G S V Frew, Chair of Varian Techtron Pty Ltd. Fellowships are awarded to distinguished overseas scientists to participate in the Australian Spectroscopy Conferences and to visit scientific centres in Australia.

2021 Selby Fellowship

Professor Matthias Wessling

Chemical engineering and sustainability

The fellowship is financed through the generosity of the trustees of the Selby Scientific Foundation. Fellowships are awarded to distinguished overseas scientists to visit Australia for public lecture/seminar tours and to visit scientific centres in Australia. Fellows are expected to increase public awareness of the physical and biological sciences and scientific issues and accordingly will be outstanding lecturers to the general public.

CONFERENCE AWARDS ANNOUNCED IN 2020

2021–22 Elizabeth and Frederick White Research Conference

Multiscale dynamics of the Southern Ocean

With the generous support of the late Lady White MBBS and the late Sir Frederick White FAA FRS, the Academy has established a series of research conferences in the physical and mathematical sciences related to the solid Earth, the terrestrial oceans, Earth's atmosphere, solar-terrestrial science, space sciences and astronomy.

2021–22 Fenner Conference on the Environment

Exceptional times, exceptional plants

With the generous support of the late Professor Frank Fenner FAA FRS and the late Mrs Bobbie Fenner, the Academy has established a series of environmental conferences on the environment and conservation issues in Australia and its environs. The purpose of these conferences is to bring together those with relevant scientific, administrative and policy expertise to consider current environmental and conservation problems in Australia, thereby contributing to the formation of policies that can alleviate some of these problems.

RESEARCH AWARDS ANNOUNCED IN 2020

2020 Aboriginal and Torres Strait Islander Scientist Travelling Research Award

The Aboriginal and Torres Strait Islander Scientist Travelling Research Award (now named the Aboriginal and Torres Strait Islander Scientist Award) recognises research primarily in the natural sciences by outstanding Aboriginal and Torres Strait Islander early- and mid-career scientists and PhD students. It also supports the expansion and growth of each scientist's research networks and international knowledge exchange through visits to relevant international centres of research. Changes to the award are being made from 2021, including a change of name to the Aboriginal and Torres Strait Islander Scientist Award.

Dr Michael-Shawn Fletcher from the University of Melbourne will visit researchers at Udayana University in Denpasar and field sites at Lakes Buyan and Beretan in Bali. His work looks at the long-term interactions between humans and climate using environmental data.

Mr Frank Loban from James Cook University will visit New Zealand. He will meet with and learn from members of Terra Moana New Zealand (the largest Maori-owned fisheries company in New Zealand) about their fisheries management and governance framework with the aim of applying this knowledge to assist in managing the Torres Strait fisheries into the future.

2021 Thomas Davies Research Grant for Marine, Soil and Plant Biology

The Thomas Davies Research Grant offers annual research grants to early- and mid-career researchers in the fields of marine, soil and plant biology. It is funded through a generous philanthropic bequest to the Academy from the estate of the late Thomas Lewis Davies.

Dr Caitlin Byrt from the Australian National University will study the mechanisms that allow mangroves (*Avicennia officinalis*) to separate salt and water, which could potentially help to manage freshwater resources. Recent advances in desalination technologies have drawn inspiration from biological systems, such as mangroves, to make the processes more energy-efficient and cost-effective.

Dr Adam Frew from the University of Southern Queensland will investigate how different communities of arbuscular mycorrhizal (AM) fungi can affect defence traits in their host plants. AM fungi are sometimes used in bio-fertilisers—they promote plant growth and stress resistance and can enhance their host plants' immune systems. They also play a key role in maintaining soil health.

Dr Bonnie Holmes from the University of the Sunshine Coast will carry out one of the first studies to explicitly assess the distribution of great hammerhead sharks (*Sphyrna mokarran*) across multiple ecosystems in QLD and NSW. Her research will collect detailed ecological

information on great hammerheads, including seasonal movements, fishery interaction and population genetic dynamics, particularly in the face of climate change.

Dr Jana Sperschneider from the Australian National University will help uncover the mechanisms behind how rust fungi infect plants. Rust fungi are a significant threat to major agricultural crops like wheat, as well as iconic Australian plants such as tea tree and lemon myrtle.

Dr Antony van der Ent from the University of Queensland will continue the search for undiscovered hyperaccumulator plants, which have the unique ability to accumulate metal and metalloid elements. Hyperaccumulators have great potential in the fields of phytomining (harvesting metals from crops), phytoremediation of soils for agriculture and environmental management, and biofortification of crops to address human micronutrient deficiencies.

Dr Amelia Wenger from the University of Queensland aims to develop evidence-based wastewater pollution guidelines that will preserve ecosystem health. She will draw on ecotoxicology statistics to develop wastewater pollution guidelines for tropical coastal and marine ecosystems. These guidelines will be used by conservation organisations, sanitation and health practitioners, and policy-makers to implement ocean-friendly sanitation management.

2020 Douglas and Lola Douglas Scholarship in Medical Science

The Douglas and Lola Douglas Scholarship in Medical Science for PhD candidates awarded a National Health and Medical Research Council (NHMRC) Postgraduate Scholarship, topping up their existing funding to cover costs of small items of equipment, research materials, travel, or research assistance. It was made possible through a generous bequest made by Lola Rachel Maude Douglas, a philanthropist with a keen interest in medical research.

Ms Roxanne Jones from the Australian National University aims to understand the health and wellbeing of Aboriginal and Torres Strait Islander children admitted to paediatric intensive care units, through a quantitative analysis of a national dataset supplemented by interviews with parents of those children admitted. She will use the award to attend an international conference, undertake professional development, and travel to interview study participants across Australia.

Dr Emily Papadimos from the Menzies School of Health Research researches the impact of in-utero diabetes exposure on early childhood growth outcomes and cardio-metabolic risk, which could help identify Aboriginal and Torres Strait Islander children who would benefit from early intervention. She will use the award to fund critical research equipment, training

and travel in order to collect better data and perform health assessments.

2021 W H Gladstones Population and Environment Fund

The W H Gladstones Population and Environment Fund was established in 2010 through generous donations from the late Dr William H Gladstones. The fund offers support for empirical research into how the size, distribution, material aspirations and other characteristics of Australia's population are likely to affect our environment—not only our land and landscape, but also social cohesion, health, the economy and defence.

Dr Fiona Tang from the University of Sydney aims to assess the environmental, social, and economic vulnerability of Australian wine producing regions under the projected future climate variations. This study will make use of big georeferenced datasets to feed big environmental and socio-economic models and aims to establish a holistic framework to model grape-wine-tourism dynamics that is vital for many rural communities in Australia.

34th International Geological Congress Travel Grant Scheme

These travel grants are made possible through a trust fund administered by the Australian Geoscience Council and the Academy, which was initiated after the 34th International Geological Congress in Brisbane in August 2012.

Dr Derya Gürer from the University of Queensland researches tectonics and the evolution of Earth's lithosphere at various spatio-temporal scales.

Dr Dylan Irvine from Flinders University researches measurements of water temperature to determine water flow, including flow in aquifers and the interaction between groundwater and surface water.

Dr Timothy Chapman from the University of New England investigates the formation and evolution of the lithosphere and mantle using a mix of igneous and metamorphic petrology.

2021 Margaret Middleton Fund for endangered Australian native vertebrate animals

The Margaret Middleton Fund for endangered Australian native vertebrate animals was established in 2000 with Dr Margaret Middleton, who donated generously to this fund across her lifetime. Dr Middleton was a long-time supporter of the Academy and early-career scientists, with the fund supporting almost 90 projects to date.

Dr Jenna Crowe-Riddell from the University of Adelaide will research critically endangered species of Western Australian sea snakes. By analysing environmental DNA and tissue samples, she'll investigate the population densities and distributions of two similar-looking (cryptic) sea snake species

in the Exmouth area. This data will be useful for assessing how best to protect sea snake populations and for managing environmental impact studies for oil and gas exploration or infrastructure developments proposed in the area.

Ms Finella Dawlings from Monash University will focus on small mammals and birds in eastern Australian native grasslands. Dawlings's project will use thermal scanners to detect the presence of endotherms (heat-emitting animals) such as the plains-wanderer and fat-tailed dunnart. This method is likely to improve long-term monitoring projects and assist in conserving small grassland fauna.

Ms Angela Simms from La Trobe University will investigate the conditions of river turtle egg incubation to find out how young in these vulnerable species can get the best start in life. The findings will have direct impacts on management of captive incubation programs for endangered turtle species.

2020 J G Russell Award

The J G Russell Award is for highly ranked Australian Research Council Discovery Early Career Researcher Awardees, topping up their existing funding. It is aimed at financially helping talented younger researchers in the basic sciences as a token of the community's regard for them. It recognises the costs involved in experimental research, and can be used towards the costs of equipment, maintenance and travel.

Dr Blanca del Rosal Rabes from Swinburne University of Technology aims to develop a contactless method based on near-infrared (NIR) light to get real-time maps of the temperature of the nervous system in living animals, to reveal the links between local heating and neural function. She will use the award to improve and expand her spectroscopy system to use laser sources, allowing her to study different fluorescent nanomaterials for use in research.

Dr Annie Colebatch from the Australian National University is researching liquid organic hydrogen carriers which can release energy on demand and be 'refuelled', to meet the challenge of clean energy. She will use the award to purchase a second pressure reactor to facilitate multiple students conducting experiments concurrently, allowing flexibility in project design and improving productivity.

Dr Laura Grogan from Griffith University aims to model the relationship between tolerance, and resistance of, chytridiomycosis (an infectious disease that affects amphibians worldwide) in Fleay's, great and giant barred frogs. She will use the award to genetically sequence the tissues that are involved in immune response, allowing her to examine a greater range of genes related to immunity.

Dr James Baker from the University of Sydney is studying soil erosion driven by flowing fluids with the aim of predicting, and ultimately preventing, intense soil loss or problematic build-up of sediment. He will use the award to fund a two-day collaboration

of Australian researchers, as well as for new X-ray equipment for measuring 3D velocities and real-time positions of eroded particles.

2021 Moran Award for History of Science Research

The Moran Award for History of Science Research is aimed at postgraduate students and other researchers with expertise in the history of Australian science. It supports access to archives that record the history of science in Australia, especially by younger researchers, and it can be used towards travel and accommodation costs.

Ms Henrietta Byrne from the University of Adelaide will explore how Australian science has responded to the question of intergenerational impacts of environmental exposures on bodies over time, focused around the British atomic testing conducted in Maralinga, South Australia between 1956 and 1968.

2019–20 Mike Smith Student Prize

The Mike Smith Student Prize is awarded for an essay based on original unpublished research undertaken whilst enrolled as a student at any tertiary educational institution in the world. Essays may deal with any aspect of the history of Australian science or Australian environmental history and may be considered for publication in the Academy's journal, *Historical Records of Australian Science*.

Ms Karen Twigg won the 2019–20 prize with her essay exploring how water availability shaped women's experience in rural Australia in the 1950s. Her work was commended for its creative topic, strong analysis and skilled presentation.

POLICY INFLUENCE AND ADVICE

The Academy provides independent, authoritative and influential scientific advice, with the aim of having an impact on Australia’s science agenda and being a trusted independent advisor on scientific matters.

2020 provided many opportunities for the Academy to contribute to important policy discussions and decisions across multiple disciplines. It actively promoted the expertise of its Fellows and worked with the other learned academies and science and research organisations to provide comprehensive information and advice to policy-makers, in particular relating to COVID-19 and the impacts of extreme weather events.

13 Led the publication of 13 Rapid Research Information Forum (RRIF) reports	3 Published 3 expert briefs on bushfires
18 Completed 18 submissions to government , including one to the UK High Commission and another to the United Nations	2 Published 2 position statements on the EPBC Act and international science collaborations
13 Made 13 submissions to parliament , including giving evidence at four public hearings	Undertook an evaluation of Defence Science and Technology’s STEM cadetship program
4 Published 4 Science for Australians features	Published a science policy analysis of the US Presidential election
	Supported the EMCR Forum to survey and report on the impacts of COVID-19 on EMCRs



COVID-19 RESPONSE

RAPID RESEARCH INFORMATION FORUM (RRIF)

Australia’s and New Zealand’s science, research and innovation sectors united to provide governments with the latest and best evidence to contain and respond to the COVID-19 outbreak.

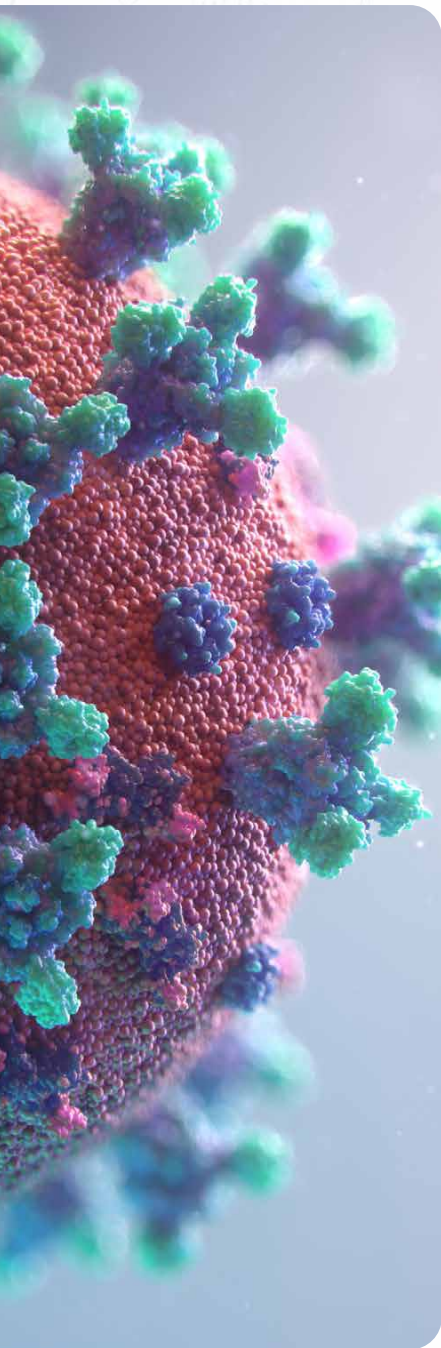
The [Rapid Research Information Forum](#) (RRIF) was convened in April, chaired by Australia’s then Chief Scientist, Dr Alan Finkel. It benefits from operational support and leadership from the Australian Academy of Science, and is a collaboration of 19 organisations including all the learned academies.

From April, RRIF participants worked together to rapidly answer pressing questions about COVID-19, as they emerged. Thirteen questions were put to the RRIF by government ministers and other key decision-makers, and RRIF responses were published on the Academy website for all to access.

The RRIF and its impact on the nation was [publicly recognised](#) by the Prime Minister, Scott Morrison, at the Prime Minister’s Prizes for Science in October.

“The Rapid Research Information Forum ... harnesses the expertise of our leading scientific institutions and provides factual, science-based answers on the pandemic for ministers. Without advice from the best minds in our science community, we could not have acted as swiftly, or as confidently or as effectively as we have.”

— Prime Minister Scott Morrison



Forum to expand with Minderoo Foundation commitment

In December, the Academy announced that the Rapid Research Information Forum would continue and expand with [support from Minderoo Foundation](#). Minderoo Foundation’s commitment of \$400,000 to the Academy will strengthen the RRIF and help lay the foundations for the model into the future.

The RRIF will continue to rapidly provide the scientific expertise needed to answer questions received from Australian Government ministers during the recovery phase of the pandemic. The Academy is also working to encourage the adoption of the RRIF as a policy model in the long term to ensure that decision-makers are drawing on the best evidence base possible whatever the policy question.

“Minderoo is thrilled to be working with the Australian Academy of Science to be part of the Rapid Research Information Forum. We eagerly anticipate the publication of the next report.”

– Research Chair of Minderoo Foundation, Ms Fiona David

COVID-19 EXPERT DATABASE

Australia’s learned academies worked together to initiate a [searchable database of experts](#) to help Australia tackle COVID-19. The database, housed on the Academy’s website, provided a mechanism for governments, the business sector, the research sector and other decision-makers to easily access the expertise they needed. The database was championed by Australia’s Chief Scientist, Dr Alan Finkel.

The call went out for experts in all fields relevant to COVID-19 including science, technology, engineering, mathematics, health, humanities, arts, and social science to self-register on the database. By the end of the year the database contained more than 1800 experts and the search page had been accessed more than 20,000 times. Analysis showed approximately 54% of experts were male and 46% female.

“Cross-disciplinary research has been the key to solving many of the world’s greatest challenges and tackling COVID-19 will be no different.”

– Ms Anna-Maria Arabia, Chief Executive, Australian Academy of Science

COVID-19 NEWS AND RESOURCES HUB

With all the resources on offer, the Academy pulled its COVID-19 information together in one easy to navigate news and resources web page. The hub landing page was accessed more than 6000 times during the year.

See the hub for [all the Academy’s information and resources on COVID-19](#).

BUSHFIRE RESPONSE

On 10 January, at the height of the 2019–20 Australian bushfires, the Academy [published a statement](#) by President Professor John Shine that said the scientific evidence base shows that as the world warms due to human induced climate change, we experience an increase in the frequency and severity of extreme weather events. The statement said there has never been a more important time to draw on the scientific evidence base to help guide Australia’s short- and long-term responses to the devastating bushfires ravaging our nation and causing uncertainty about our future. The statement web page received more than 169,000 views, peaking at 121,000 on the day of publication.

Later in the year, the Academy published three evidence briefs synthesising the scientific evidence on a range of topics.

[Soil condition after bushfires](#) focused on how bushfires affect soil fertility, agricultural productivity and recovery of native vegetation; [Monitoring wildlife recovery](#) focused on the impacts bushfires on wildlife and habitats; and [After the bushfires: Addressing the health impacts](#) focused on the impact bushfires have on physical and mental health and was written jointly with the Australian Academy of Health and Medical Sciences (AAHMS).



FUTURE EARTH AUSTRALIA

Future Earth Australia, a program of the Academy, is a national peak initiative that enables Australian researchers, governments, industry and NGOs to collaborate with each other and with international networks and programs across Australia and Oceania. It aims to establish an interconnected knowledge platform of expertise and creativity capable of forming solutions to the sustainability challenges facing Australia, our regional neighbours, and the globe. It is leading important conversations that are informing and changing the national policy environment.

Future Earth Australia:

- conducted extensive community consultations to inform its next 10-year strategy for sustainable oceans and coasts, which will outline clear, actionable strategies for achieving healthy and resilient oceans and coasts for all of Australia
- worked with the University of Sydney and Western Sydney University to organise a Climate Adaptation Summit in April 2021
- pivoted the planned international 2020 Sustainability Research and Innovation conference in Brisbane to a hybrid (in-person and online) event in June 2021, enabling the additional participation of thousands of people from across the globe
- continued its engagement strategy for the implementation of its 10-year strategy for sustainable cities and regions.

More details can be found at Future Earth Australia's [2020 Year in Review](#).



TAXONOMY AUSTRALIA

The mission of [Taxonomy Australia](#), a program of the Academy, is to discover and document all remaining Australian species of plants, animals, fungi and other organisms within a generation. It aims to increase the profile and understanding of taxonomy and biosystematics in the community and with government and industry; help bring about a greatly accelerated discovery and documentation of Australia's undiscovered species; and implement the recommendations of the decadal plan for taxonomy and biosystematics.

During the year, Taxonomy Australia organised the taxonomy and biosystematics sector to take action during the heightened public awareness of biodiversity loss—on the solid premise that if we don't discover the remaining 70 per cent of species in Australia, we won't know what we have lost to fire and other natural disasters.

Taxonomy Australia delivered:

- what was thought to be the first national meeting of taxonomy and biosystematics experts (online due to the pandemic), and [a report of the outcomes of this national meeting](#)
- a funding drive for [DiscoverBees](#)
- the [Species 2020 dashboard](#)
- an [Australian Taxonomy Community Directory](#).

EDUCATION

The Academy’s popular [school education programs](#), Primary Connections: linking science with literacy (years F to 6), Science by Doing (years 7 to 10), and reSolve: Mathematics by Inquiry (years F to 10), responded to the pandemic by supporting teachers, parents and students.

SUMMARY OF ACHIEVEMENTS AND ACTIVITIES

- Funding of \$9 million over five years (2020–21 to 2024–25) to support the continuation of the Academy’s education programs Primary Connections, Science by Doing and reSolve was announced in the Australian Government October 2020–21 Budget
- The programs provided customised resources to support teachers, parents and students during emergency remote learning in COVID-19 school site closures
- Unprecedented traffic on all three education program websites in the March–June 2020 period was recorded as schools moved towards remote learning, driven by referrals from state education departments across the country
- The programs presented papers at the Australian Science Education Research Association Conference, and delivered webinars with the Australian Computer Society, Digital Learning and Teaching Victoria, and the Science Teachers Association of New South Wales

COVID-19 RESPONSE

The impact of COVID-19 on Australian schools and schooling was significant. The Academy offered support, advice and resources to systems, schools and teachers delivering alternative methods of education. Its Australian Curriculum linked Foundation to Year 10 science and mathematics education programs were available online and remained free of charge.

As Academy education programs are generally developed for school-based settings, resources were customised for the COVID-19 circumstances.

To ensure these resources were useful, practical and connected to what was happening in schools across the country, customisation occurred in consultation with teachers, students, state and territory education departments, and national agencies such as Education Services Australia and the Australian Curriculum, Assessment and Reporting Authority.



Academy education resources are available online, including e-Resource sheets for all Primary Connections units.

PRIMARY CONNECTIONS

As teachers and schools adapted and transitioned to alternative methods of delivering education, Primary Connections developed learning and teaching resources suitable for remote implementation. In developing these resources, Primary Connections aimed to:

- give teachers flexibility and agency with resources to most appropriately deliver at-home learning for different contexts and student needs
- equip teachers to support parents and carers to implement learning at home
- link science with literacy, be guided by education research, incorporate collaborative learning principles, and include opportunities for investigating and embedded assessment
- encourage curiosity, build an awareness of science in our everyday world, and develop scientific literacy.

“Thank you, these [Primary Connections] resources enabled us to keep the students motivated with their learning throughout this difficult time.”



SCIENCE BY DOING

Teachers in schools across Australia responded to the need to offer online learning lessons to students in self-isolation, however, distance education teachers had been successfully using Science by Doing for remote learning long before the pandemic.

For those teachers new to online learning, Science by Doing developed a starter’s guide containing insights from distance education teachers and classroom teachers now organising remote learning for their students.

“Science by Doing is an excellent resource for schools to adopt. It is aligned with the Australian Curriculum and has tasks that engage students and teachers alike. It is also a very useful platform to help deliver content during this time of online learning.”

— Gemma Paterson, Amaroo School, ACT

RESOLVE: MATHEMATICS BY INQUIRY

reSolve worked with the New South Wales Department of Education to support online mathematics learning, both via teachers and direct to students. It provided additional resources to supplement existing sequences, including:

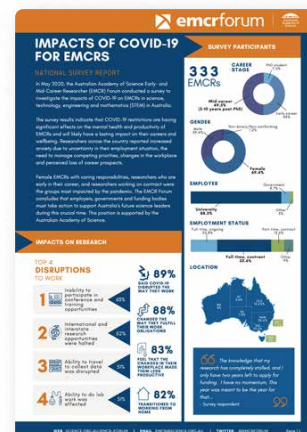
- printable student workbooks
- instructional and demonstrative videos
- advice for adapting to home learning.



DIVERSITY AND INCLUSION

The Academy aims to be a national leader in diversity and inclusion in Australia’s science sector. It is committed to supporting excellence in science and empowering the next generation of scientists and recognises that to achieve this it must celebrate and embrace diversity and inclusion in all its forms and embed diversity and inclusion in everything it does.

As a national learned academy, it has a responsibility to model, promote and influence best practice in diversity and inclusion in the science sector in Australia.



56%

Women made up 10 of the 18 Academy’s honorific award recipients (56%)

300

More than 300 EMCRs were surveyed to investigate the impacts of COVID-19 on researchers

5

5 submissions were made to government on behalf of EMCRs

2600

In the first year of the STEM Women online directory, 2600 women created a profile

41,000

More than 41,000 people visited the directory

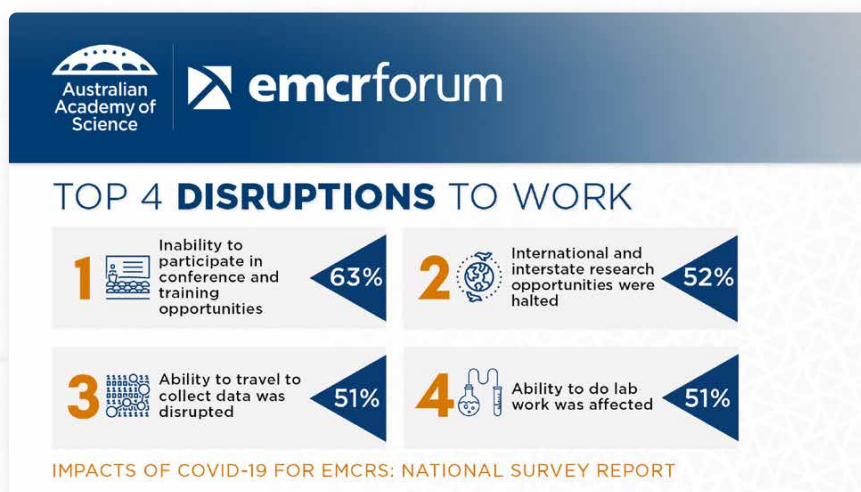
EARLY- AND MID-CAREER RESEARCHERS (EMCRS)

SUPPORT FOR EMCRS DURING COVID-19

The Early- and Mid-Career Researcher Forum is the national voice of Australia’s emerging scientists.

The Forum Executive, with the support of the Academy, conducted a survey of more than 300 EMCRs in May to investigate the impacts of COVID-19 on researchers. The [report found](#) significant effects on EMCRs’ mental health and productivity, and prompted a call for employers, governments and funding bodies to take action to support Australia’s future science leaders. The Forum Executive shared insights from the survey on the ABC TV Program The Drum on in June, and met with representatives of the NHMRC in August and with the Minister for Industry, Science and Technology, the Hon Karen Andrews MP, in September to discuss follow-up actions from the report to support the research sector.

Science Pathways 2020: Global Dialogue, a conference planned for EMCRs, was cancelled due to COVID-19 restrictions. The Forum Executive instead implemented a strategy to support the EMCR community and keep researchers connected, including a series of [webinars and virtual catch-ups](#) to address the professional development needs of EMCRs in Australia and provide opportunities to network with peers.



SUBMISSIONS TO GOVERNMENT

The Forum Executive made:

- a submission to the Victorian COVID-19 Inquiry outlining the impact of the ongoing lockdown on EMCRs, and recommending actions the Victorian Government could take to ease the impact on researchers
- two submissions to the Australian Government’s Job-ready Graduates package: one to the Departmental Inquiry and one to the Parliamentary Inquiry. These submissions highlighted concerns shared with the Australian Academy of Science regarding the impact of funding cuts per student, and the disproportionate impact this will have on EMCRs
- submissions to the Medical Research Future Fund (MRFF) strategy and priorities review, and to the ARC Excellence in Research in Australia review. In these submissions, the Forum advocated for the inclusion of new metrics to expressly capture the role of EMCRs in driving research and publications for universities.

THEO MURPHY INITIATIVE

Empowering regional research

Sixty EMCRs participated in the Empowering Regional Research conference in February, aimed at providing EMCRs working outside of major cities with an opportunity for professional development, focusing on building skills in key areas that are applicable to industry, academia and other areas, and transferable across different fields.



GENDER EQUITY IN SCIENCE

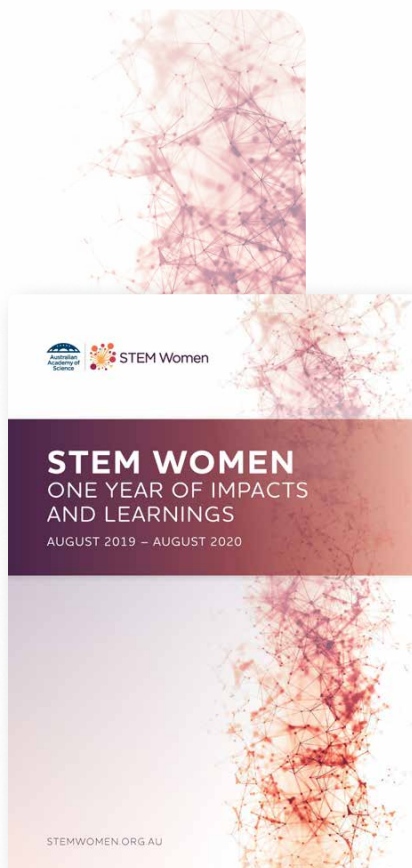
THE IMPACT OF COVID-19 ON WOMEN IN THE STEM WORKFORCE

In May, Academy Fellows joined other experts in authoring and reviewing a research report requested by the Minister for Industry, Science and Technology, the Hon Karen Andrews MP, on the impact that COVID-19 was specifically having on women in the STEM workforce. The report was produced by the Rapid Research Information Forum and was led by Science & Technology Australia (STA) and the Australian Academy of Technology and Engineering (ATSE).

The report found that hard-won gains for women’s advancement in the STEM workforce were at risk of a major setback due to the COVID-19 pandemic. Even before the pandemic hit, women were under-represented in STEM. Early evidence from during the shutdown suggested women in the STEM sector suffered even greater job losses than men. It also pointed to women carrying a greater share of responsibilities for caring and distance learning duties during isolation.

STEM WOMEN DATABASE

The STEM Women online directory published its successes and future development in its [first-year impact report](#). The directory was established to combat the lack of representation of women in STEM. With a target of publishing more than 1000 profiles in its first year, more than 2600 women created a profile and more than 41,000 people visited the site.



Earlier in the year, STEM Women carried out an evaluation to determine the directory's demographic and how the website was accessed by women in STEM, including current and potential members. Results showed that three-quarters of STEM Women members work and study in the higher education and research (HER) sector, with substantial variety in STEM subject matter expertise. Over 10% of profiles identified with several diversity attributes including culturally and linguistically diverse, LGBTQI+, Aboriginal, Torres Strait Islander, having a disability and neurodiverse.

"With the current gender disparity in the fields of engineering and IT, the STEM Women database has provided a brilliant and much needed central resource to bring forward the profiles of women in STEM from all across Australia ... Through my profile I got the opportunity to have an amazing experience to mentor a team of students."

*— Dr Mureena Bano, Senior Lecturer,
School of Information Technology, Deakin University*

CATALYSING GENDER EQUITY 2020 CONFERENCE

The [Catalysing Gender Equity 2020 Conference](#), held in February in Adelaide, demonstrated the success, impact and growth potential for inclusion and diversity in STEM. The two-day conference was hosted by the Academy in collaboration with Science in Australia Gender Equity (SAGE).

The conference was guided by the [Women in STEM Decadal Plan](#) and brought together representatives from across research, industry, education and government to celebrate success and highlight key action areas to achieve change.

In January, the Academy announced its inaugural group of 12 [STEM Women Changemakers](#). These women are using their knowledge, experience and networks to share their ideas and solutions for gender equity in Australian STEM. The Changemakers were supported to attend the conference due to a generous donation by Professor Michelle Coote of her Georgina Sweet Fellowship.

The conference was made possible by the generous support of the conference partners: UniBank, the Australian Government Department of Defence, Edith Cowan University, Flamingo AI and Queensland University of Technology.



SCIENCE IN AUSTRALIA GENDER EQUITY (SAGE)

During the year, Science in Australia Gender Equity completed its transition from a pilot program based at the Academy to the independent not-for-profit entity, Science in Australia Gender Equity Limited (SAGE Ltd), founded in partnership between the Australian Academy of Science and the Australian Academy of Technology and Engineering.

The Catalysing Gender Equity 2020 Conference, co-hosted by SAGE coincided with the 2020 SAGE Awards dinner that celebrated the 11 most recent recipients of the Athena SWAN Institutional Bronze Awards.

RECONCILIATION ACTION PLAN

The Academy is committed to advancing reconciliation, creating opportunities to work respectfully with Aboriginal and Torres Strait Islander peoples, supporting their contribution to scientific activities, and increasing understandings of Indigenous knowledge.

In 2020, the Academy continued to implement the actions contained in its [Reflect Reconciliation Action Plan](#) by:

- continuing to deepen relationships with Aboriginal and Torres Strait Islander people, including supporting the first steps towards the creation of an Indigenous scientists' network to support Indigenous people engaging in STEM. In November, the Academy worked with Indigenous leaders, Science & Technology Australia (STA) and the Australian Academy of Technology and Engineering (ATSE) to host the first online workshop to advance the network
- convening two online NAIDOC Week 2020 events featuring six Indigenous panellists, focusing on the 'science of a continuous culture'
- establishing a RAP progress web page on the Academy website to track our progress towards reconciliation
- continuing to offer and promote the Academy's [Aboriginal and Torres Strait Islander Scientist Award](#) and the [Douglas and Lola Scholarship in Medical Science](#)
- continuing to make the 'Core Cultural Learning: Aboriginal and Torres Strait Islander Australia Foundation Course' available to Academy Fellows and staff
- producing an [Acknowledgement of Country guide](#) for Fellows, staff and others to use at events and meetings.

Due to the impacts of COVID-19, Reconciliation Australia allowed the Academy an extension to February 2021 to achieve the deliverables outlined in the Academy's Reflect Reconciliation Action Plan.

From Twitter

"What an amazing #NAIDOC2020 event on 'The sky & stars: the science of a continuous culture' hosted by @Science_Academy yesterday! Thank you so much to @AstroKirsten @raejohnston and Djarra Delaney for sharing your knowledge and passion for #IndigenousScience! #NAIDOCWeek2020"

— @matilda_hd, Matilda Handsley-Davis

"Very engaging talk about the importance of recognizing and respecting Indigenous Science!"

— @GabriellaAlleg5, Gabriella Allegretto

NATIONAL SCIENCE WEEK

The Black Summer fires of 2019–20 were a stark example of our changing climate. To explain how science can help us tackle future bushfire seasons, we were joined in a [free webinar](#) during National Science Week by Sandra Whight, an ecologist who has more than 25 years' experience as a firefighter and operational decision-maker and is now with the Bureau of Meteorology, and Associate Professor Michael-Shawn Fletcher, an Indigenous scientist at the University of Melbourne who specialises in fire ecology, climatology and geology. Much of his research focuses on the role of Aboriginal people in creating the Australian landscape—many places we consider wilderness were created intentionally with fire by Aboriginal people to make landscapes resource rich for them.

NAIDOC WEEK—THE SCIENCE OF A CONTINUOUS CULTURE

Land, water, fire, and the sky and stars, were the focus of [two online Academy events](#) for this year's NAIDOC Week 'Always Was, Always Will Be'. The events explored how Aboriginal and Torres Strait Islander peoples have nurtured a connection to Country, with a profound sense of responsibility to the natural world, for more than 60,000 years, and the challenges they face. The recordings of the events are compelling watching.

Panellists for land, water and fire included Associate Professor Michael-Shawn Fletcher, a Wiradjuri man from the University of Melbourne; Associate Professor Bradley Moggridge, a Murri from the Kamilaroi Nation and from the University of Canberra; and Zena Cumpston, a Barkandji woman from the University of Melbourne. Panellists for the sky and stars were Kirsten Banks, a Wiradjuri woman from the University of New South Wales and Djarra Delaney, from the Quandamooka people of Minjerribah, North Stradbroke Island and from the University of Melbourne. Journalist and science communicator, Rae Johnston, a Wiradjuri woman, facilitated the discussion.

COMMUNICATING SCIENCE

The Academy focused much of its communication of science on the impacts of the 2019–20 bushfires and COVID-19, making credible and factual information available to a broad national and international audience.

Social media

FACEBOOK FOLLOWS UP 14% TO 2.4M

2.4M people follow the Academy's Facebook page (up 14%). A total of 491 posts were published (up 70%) resulting in 760K reactions, comments and shares on our posts (up 32%). Content reached an estimated total of 42.7M people world-wide. Videos were viewed 10.6M times (down 58%) and amassed a total of 81.3K hours of watch-time (down by 45%)

21K people follow the Academy's Instagram page (up 24%). 79 posts were shared (up 9%) leading to 13K engagements (down 32%). Videos were watched 4.9K times (down 75%).

INSTAGRAM FOLLOWS UP 24% TO 21K

27.6K YOUTUBE SUBSCRIPTIONS

27.6K people subscribe to the Academy's YouTube channel. Videos were watched 1.6M times (up by 190%), 25.4K hours watched (up by 140%), 22.4K subscribers (up by 300%), and 18.8M impressions (up by 890%).

TWITTER FOLLOWS UP 18% TO 54K

54K people follow the Academy's Twitter account (up 18%). 2.5K tweets were shared (down 15%), resulting in 55K engagements (down 18%).

Stories/mentions of the Academy on social media. 50,600 with 38,100 mentions of the Academy's social media handles only. The majority of mentions are from Facebook and Twitter.

Top science video stories

Most watch-time on Facebook: [Jellyfish stings – how to treat them](#) (3.79K hours), [Tricky health checks for humpback whales](#) (3.52K hours), [Why do blind snakes have eyes?](#) (2.85K hours), and [Explosions from the deep](#) (2.77K hours).



Most watch-time on YouTube: [Einstein was right](#) (11.9K hours), [COVID-19 vs Flu](#) (1.50K hours), [Falling Walls Lab Australia 2020 live event](#) (836 hours), [At least a billion animals killed in bushfires](#) (659 hours).

The Curious website, where we publish our science articles and videos for a broad audience, received nearly 3.6M visits, 125% more than 2019 and 265% more than 2018.

Academy website: The Academy website received nearly 1.8M visits, 80% more than 2019 and 165% more than 2018.

Media

88 ACADEMY NEWS STORIES

88 Academy news stories published on the website

Most embedded single Academy video by online news media: [Vaccine contenders explained with Ian Frazer](#) (118 times across Australian Community Media)



732

Total number of times Academy videos were embedded by online news media, including syndications

87

87 different Academy videos embedded by online media

26

Total number of times an Academy article was embedded/referenced by online news media, including syndications



Most embedded/referenced article by online news media: [How to survive magpie swooping season](#)

3489

Media stories about the Academy/mentions of the Academy across broadcast (1375) print (48) and online media (2066)

COVID-19

In June, the Academy was ranked the [seventh most prominent source of information](#) in Australian media during the COVID-19 pandemic by the Australian Science Media Centre (AusSMC). The research looked at coronavirus-related media items in major metropolitan newspapers and the nation's biggest news websites from the initial outbreak in China until the end of May.

"It is reassuring to see that people qualified in immunology, virology and epidemiology have generally been the most prominent academic voices during the pandemic."

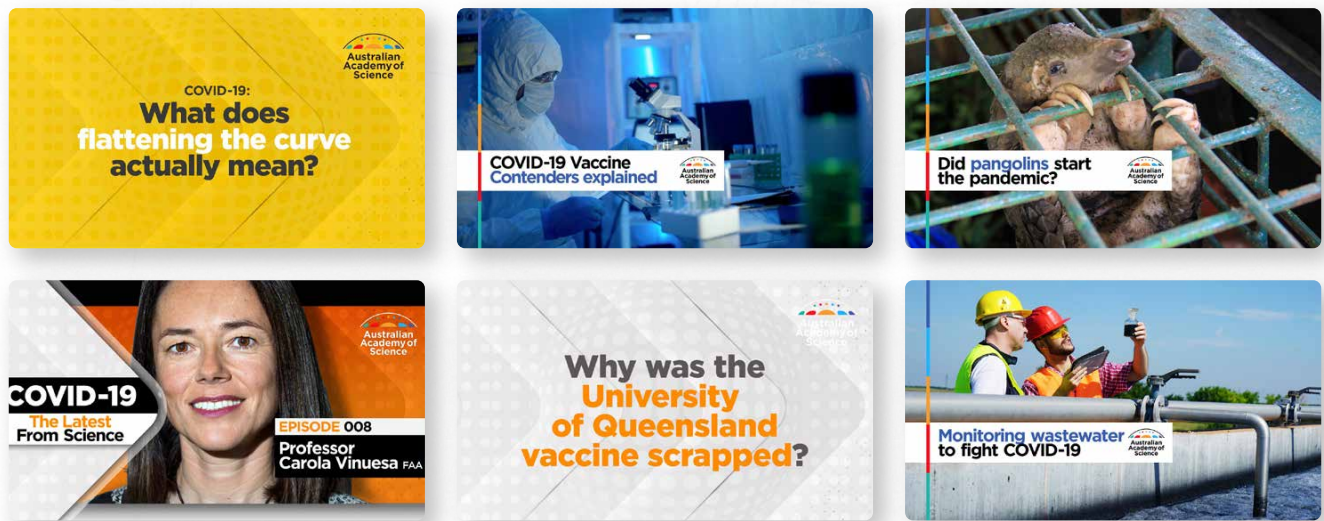
— Ms Lyndal Byford, Director of News and Partnerships, AusSMC

The Academy published 43 videos and 9 articles explaining the science and impacts of the pandemic to a broad audience on social media, and freely shared them with mainstream media.

[See all the Academy's COVID-19 videos and articles](#)

VIDEOS

The Academy published nearly 90 short and longer form videos. These became important sources of information for broad audiences on a wide range of topics, and raised the profile of leading scientists by featuring the Fellows elected in 2020, and the 2020 recipients of Academy awards.



ARTICLES

The Academy’s articles on COVID-19 covered topics such as social distancing, soap vs sanitiser, mental health, zoonotic diseases and vaccines. These articles provided opportunities to present information in more depth than a video, forming complementary and accessible sources of information that were shared on social media and referenced by media outlets.



GLOBAL SCIENCE TV

The Academy initiated [Global Science TV](#) in partnership with the International Science Council (ISC), producing videos on the pandemic and giving voice to global experts to help address the big questions. Tapping into the ISC’s extensive network, Global Science TV broadcast interviews with the world’s best scientists and some of our greatest thinkers. Hosted by Australian journalist and clinical psychologist Nuala Hafner, the episodes informed viewers on notable scientific issues that society faces today, including COVID-19 and climate change. Global Science TV published 19 episodes from June to December.

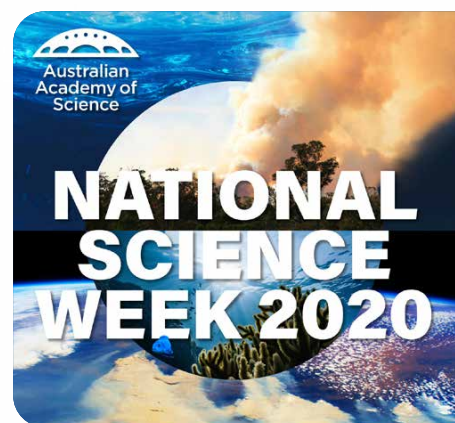
EVENTS

The Academy participated in or delivered 17 events, with a combined audience of thousands. Science at the Shine Dome, the Academy's flagship annual three-day event, was postponed due to the pandemic, and the Canberra speaker series, Food for Thought, was postponed to 2021. Several other in-person events were cancelled or postponed, but the Academy—which already had a proven track record in digital production—was able to create new opportunities by holding events online.

NATIONAL SCIENCE WEEK

Oceans and bushfires were the focus of [two National Science Week events](#) in August, with the Academy hosting webinars which explored how science can help us improve the health of our oceans and manage bushfires. More about these events in Diversity and Inclusion [page 43](#)

During National Science Week week the Academy also joined with the Australian Academy of Law to sponsor a symposium on the [reception, quality and evaluation of scientific evidence in Australian courts](#). The online event was moderated by the Hon Justice Virginia Bell AC, Judge of the High Court of Australia, and drew an estimated audience of around 600. It was the third year the two academies have held a joint event and the first time it was held fully online.



CELEBRATING SCIENCE: PRIME MINISTER'S PRIZES FOR SCIENCE

Traditionally, the Academy acknowledges recipients of the Prime Minister's Prizes for Science in October with a breakfast at the Shine Dome, but the Academy instead held an online celebration to recognise these leading researchers, innovators and teachers. [Interviews were held](#) with the recipients of the Prime Minister's Prize for Science and the Prime Minister's Prize for Innovation, and others awarded for science, innovation and excellence in science teaching were honoured. The Academy event was supported by the Department of Industry, Science, Energy and Resources.



THE PRIME MINISTER'S PRIZES FOR SCIENCE

SUPERCOMPUTING TO FIGHT COVID-19

In December, the Academy held the first in a series of webinars on COVID-19 in collaboration with the Department of Industry, Science, Energy and Resources. [Supercomputing to fight COVID-19](#) looked at how supercomputing allows researchers to run large volumes of calculations in epidemiology, bioinformatics and molecular modelling. Supercomputing increases the speed with which the spread of the virus can be modelled, assists in finding a vaccine, and improves treatments. Speakers from Australia, Japan and South Korea discussed how supercomputing in these countries is helping to address the COVID-19 pandemic.



MORE ABOUT OUR EVENTS

The following events are covered elsewhere in this annual report:

- Falling Walls Australia—see [page 23](#)
- NAIDOC Week—see [page 43](#)
- The Sustainable Shine Dome—see [page 49](#)
- Under the microscope—See [page 22](#)
- Impacting science from a small country—Q&A with Nobel Prize laureate See [page 22](#)

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.

In 2020, HRAS had 69 institutional subscribers and recorded 22,420 downloads. Of the 27 articles published, 8 were historical articles, 4 were biographical memoirs and 15 were book reviews.

The journal's editors are Dr Sara Maroske and Professor Ian Rae, and an Editorial Committee of Fellows and other experts guides the direction of the journal. HRAS is published online only, with hard copies available on request for an annual subscription fee. Biographical memoirs of Fellows are available free [on the Academy website](#) following publication in HRAS. Academy Fellows have access to the online version of the journal for free.

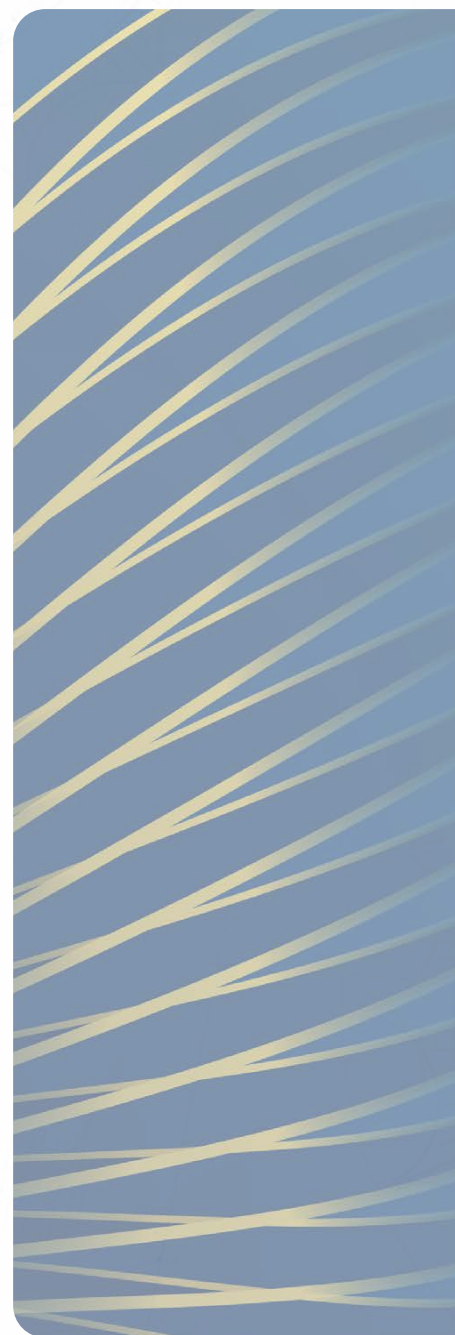
AUSTRALIAN JOURNALS OF SCIENTIFIC RESEARCH

Separate to the publication of HRAS, a new [five-year partnership agreement](#) between the Academy and CSIRO commenced in 2020, strengthening the organisations' long-term commitment to Australian science as part of the global research enterprise. The two organisations have long cooperated to publish the CSIRO-owned journals of scientific research which are published by CSIRO Publishing, an editorially independent not-for-profit business unit of CSIRO.

CSIRO Publishing and the Academy jointly publish 14 journals of scientific research. The journals have an international readership, and can be accessed for free or low cost by scientists in more than 120 low- and middle-income countries through the United Nations' Research4Life program. Editorial policy is determined by a Board of Standards, which is jointly chaired by CSIRO and the Academy. In 2020, the co-chairs for the Board of Standards were CSIRO's Dr Paul Savage and Professor Lynne Cobiac, and Academy Fellow Professor Max Coltheart.

CSIRO Publishing offers four open access models 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.

[More about all the journals published by CSIRO Publishing.](#)



HISTORICAL ARCHIVES

The Academy's historical archives stored in the Shine Dome were in danger of hail and water damage during a hailstorm in January, but fortunately were able to be rescued in time. The Academy is the only place in the world that holds these scientific collections and there is strong global interest to access the archives. [Fundraising to digitise the important collections](#) began after the hailstorm was commenced, and is ongoing. See [page 18](#) for information on volunteering to assist with the archives.

THE SHINE DOME

The Shine Dome is the home of the Australian Academy of Science and is a great source of pride for the Academy. The Shine Dome is both a meeting place for Australia's leading scientists and an iconic building that many people in Australia—and across the globe—recognise. It is available for external bookings and provides a unique venue for public and private meetings and events.

shinedome.org.au



THE SUSTAINABLE SHINE DOME PROJECT

The Academy committed to reducing its impact on climate change by working towards a [net-zero emissions](#) future for the Academy's iconic building in Canberra, the Shine Dome. The University of Canberra partnered with the Academy to develop a sustainability plan that will renew or replace the dome's environmental management systems after receiving more than \$200,000 in the Australian Government's National Heritage Grants.

As part of the project, the public has the opportunity to take part in a series of educational activities to improve the awareness of the Shine Dome's national heritage values, with the first activity [held in December](#).

The project is being undertaken simultaneously with the restoration of the copper covering the dome, which was damaged in a hailstorm early in the year.

HAILSTORM DAMAGE AND REPAIR

The Shine Dome sustained serious damage during a severe hailstorm in late January that cut a swathe through Canberra. The hail dented the heritage listed Shine Dome’s copper roof tiles and smashed several skylights, exposing the building’s nationally significant scientific archives to the hail and rain. Fortunately, the archives were saved due to a rescue effort by staff, who formed a human chain to move the boxed archives to safety.

The restoration of the Shine Dome is using innovative solutions to bring the outside of the building back to its former glory. Rather than removing the damaged copper tiles, skilled construction workers commenced covering the dome with a second layer of new copper and laying waterproof material between the two layers. Airflow between the copper sheets will provide insulation and improve the building’s energy efficiency.

The adjacent historic Ian Potter House, where staff are based, also suffered extensive hail damage in the hailstorm—roof tiles and windows were smashed and the building was rendered inoperable. The Secretariat temporarily moved to the Shine Dome immediately after the hailstorm and to a nearby office building in March. Work commenced to repair the roof of Ian Potter House so that internal repairs and renovations could be undertaken. It’s expected that Ian Potter House will be ready for the Secretariat to return in the second half of 2021.



IMPACT OF COVID-19

COVID-19 restrictions severely limited the opportunities for external hire of the Shine Dome as a venue for most of the year. Concurrently with the roofing work, external events at the Shine Dome began to resume as restrictions on gatherings eased toward the end of the year.

ACADEMY OPERATIONS

GOVERNANCE

Officer of Council (EXCOM) who retired



Professor Jim Williams
AM FAA FTSE
Vice-President and Secretary
Physical Sciences

Fellows elected to Ordinary Member positions



Professor Lyn Beazley AO FAA FTSE

Ordinary member of Council who retired



Professor Max Colthart
AM FAA FASSA



Professor Bob Williamson
AO FAA FAHMS(Hon) FRS

Fellow elected to Council Officer (EXCOM) position



Professor Malcolm Sambridge FAA
Vice-President and Secretary
Physical Sciences

Council appointments



Professor Louise Ryan FAA
To fill a casual vacancy on Council



Professor Sue O'Reilly AM FAA
Co-opted onto EXCOM to assist
Secretary Education and Public
Awareness and Observer at Council.

COUNCIL MEMBERS FROM 28 MAY 2020

Executive Committee

- **Professor John Shine AC PresAA FRS**
President
- **Professor Malcolm Sambridge FAA**
Secretary Physical Sciences
- **Professor Helene Marsh AO FAA FTSE**
Secretary Biological Sciences
- **Professor Elaine Sadler AO FAA**
Foreign Secretary
- **Professor David Day FAA**
Secretary Science Policy
- **Professor Hans Bacher AM FAA**
Secretary Education and Public Awareness
- **Professor Michael Barber AO FAA FTSE**
Treasurer

Members

- **Professor Marilyn Anderson AO FAA FTSE**
- **Professor Lyn Beazley AO FAA FTSE**
- **Professor Ian Chubb AC FAA FTSE**
- **Professor Wendy Hoy AO FAA**
- **Professor Ivan Marusic FAA**
- **Professor Suzanne O'Reilly AM FAA (Observer)**
- **Professor Halina Rubinsztein-Dunlop AO FAA**
- **Professor Louise Ryan FAA**
- **Professor Frances Separovic AO FAA**
- **Professor Carola Vinuesa FAA**
- **Professor Bob Williamson AO FAA FRS**

FINANCIAL REPORT 2019–20

[Read the Academy's financial report for 2019–20](#)

ACADEMY EMPLOYEES

At the end of the year there were 65 staff: 45 full time, 20 part time, 51 identified as female, 11 identified as male and 3 chose not to specify a gender.

The Academy hosted 9 interns for various periods.

Staff responded with agility and demonstrated outstanding commitment to continuing the Academy's mission throughout the COVID-19 pandemic, with all staff working remotely from home for more than seven months in 2020. Staff continue to work flexibly in a hybrid model.