



The significant loss of unique Australian biodiversity means the bushfires are unprecedented anywhere in the world.
Photo: CSIRO

Message from the President

February 28, 2020

It's been a very difficult six or so months for Australians, with many parts of the country—including millions of people—experiencing ongoing drought as well as extreme heat, bushfires, air pollution, floods and storms. I extend the thoughts and kind wishes of the Fellows and staff of the Academy to all those affected, both directly and indirectly, by what we have experienced and are still experiencing.

Science and scientists will continue to support many aspects of human and environmental recovery, adaptation and mitigation, both locally and in the design of recovery programs and new policies. In addition, the challenge of the international COVID-19 health emergency is being addressed by scientists, with Australians playing a vital part.

The physical home of the Academy in Canberra has not escaped unscathed, with the heritage listed Shine Dome and historic Ian Potter House both receiving significant damage from a hailstorm that also badly affected CSIRO's research facilities and the Australian National University.

The Academy was vocal and active as the bushfire crisis worsened. In January we published a statement on the bushfires that received nearly a quarter of a million visits on our website and

which was shared nationally and internationally in media and social media. We continue to provide scientific advice directly to the Prime Minister, Minister and the National Bushfire Recovery Agency. We are currently using our collective expertise to develop a range of information and advice which will assist organisations and individuals to base their decisions on scientific evidence, and we are bring together experts from around Australia to discuss in detail changing fire behaviour and fuel management. More is planned for this year, and we will keep you informed as this work progresses.

I am, as always, impressed by and grateful for the depth of knowledge and talent within the Fellowship, and the willingness of Fellows to share their expertise.

Fortunately, and importantly, the Academy also has much to celebrate. Congratulations to the five Fellows who were recognised in the Australia Day honours, and to the recently announced researchers who are to receive Academy awards and research funding this year. Nominations and applications are now open for our 2021 awards, including two new career awards. Science needs the best and most creative minds, and we are seeking award applicants from all career stages, backgrounds and genders. I strongly encourage women to nominate for all awards,

and in particular the career and mid-career honorific awards.

Our support for women in STEM continues, with our national gender equity conference and the SAGE awards dinner giving many the chance to learn from each other and celebrate progress.

Information on many of these things and more is in this month's newsletter. Thank you for taking time to read it.

Professor John Shine



Academy President Professor John Shine

Statement regarding Australian bushfires

January 10, 2020

The Australian Academy of Science acknowledges the devastating impact the Australian bushfires are having—and will continue to have—on people, our environment and our economy.

The scale of these bushfires is unprecedented anywhere in the world.

The Academy extends its support and sympathy to all those who have lost loved ones and whose lives are directly and indirectly impacted. We thank the many volunteers, individuals, leaders and foreign nations for their efforts and contributions.

As an independent and authoritative scientific adviser to the parliament and to the nation, the Academy draws on the scientific expertise of Australia's leading scientists—the Fellows of the Academy.

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.

As a nation, we must deal with extreme weather events more effectively than we currently do. As such events become more frequent and severe, we must adapt Australia and Australians accordingly, as well as strengthen mitigation efforts.

Bushfires, along with other weather and climate challenges, pose complex and wide-ranging problems. Population growth, climate change, temperature extremes, droughts, storms, wind and floods are intersecting in ways that are difficult to untangle and address.

The good news is that there is already abundant evidence available to help us understand the environment we live in and to design and build the future we want for Australia. There has never been a more important time to draw on that scientific evidence base to help guide Australia's short- and long-term responses to the devastating bushfires ravaging our nation and that are causing uncertainty about our future.

The Academy's Fellows are contributing and will continue to contribute their scientific expertise to government and other decision makers in the interest of advancing our nation.

The Academy is resolute that the response to the bushfires must extend beyond the immediate and essential need to rebuild and recover.

Everything, including urban planning; building standards; habitat restoration; biodiversity and species preservation; and land, water and wildlife management will need careful and measured consideration.

We must further improve our ability to forecast changing environmental threats and continually improve climate modelling predictions. We must improve our understanding of fire behaviour and other adverse weather events, and we must continually develop new technologies, practices and behaviours to assist our nation to respond and adapt to, manage, and mitigate against such extreme events.

All the while, Australia must take stronger action as its part of the worldwide commitment to limit global warming to 1.5° C above the long-term average to reduce the worst impacts of climate change.

To have the best chance of succeeding, we must draw on all the available evidence and

knowledge, including working with Aboriginal and Torres Strait Islander peoples and undertaking further research where it will have the most benefit.

The Academy is aware that Australians are looking for trustworthy information and answers about the links between climate change and the bushfires. With much misinformation in the public domain about the cause and impacts of the bushfires, we urge Australians to continue to consult reputable sources of evidence-based information such as the Australian Academy of Science, CSIRO and the Bureau of Meteorology.

In this context, visits to the Academy's website are up 30 per cent compared to the same period last year, and the top visited page is **What is Climate Change?**¹ Viewing and sharing of the **Academy's video series**² on this matter published across social media platforms are rapidly rising.

Professor John Shine AC PresAA
President
Australian Academy of Science

The Australian bushfires—why they are unprecedented

February 03, 2020



At least a billion animals killed in bushfire
Watch on YouTube: <https://youtu.be/dx1WnWjo-yQ>

In a **statement on the Australian bushfires**³ published on 10 January 2020, the President of the Australian Academy of Science, Professor John Shine, stated that 'the scale of these bushfires is unprecedented anywhere in the world'.

Australia has extraordinarily high levels of biodiversity and is one of 17 countries with 'megadiversity' of plant, insect and animal life. Of the more than 600,000 predicted species in Australia, **only 30% have so far been discovered, documented and named**⁴.

In terms of hectares burnt the Australian fires are the largest to affect any of the megadiverse countries—that is, larger than the 2019 Amazon and 2019 Californian fires.

Fires of greater geographical extent have occurred in Australia in the past (e.g. fires in central Australia in 1974-75 covered over 100 million hectares). However, these fires burned largely the grasslands of inland Australia. Unlike forest fires these grassland fires are less intense and the ecosystems can more rapidly recover. Also, there is far lower economic impacts or loss of life because these fires occur in vast remote landscapes.

Australian Academy of Science Fellow Professor Chris Dickman has estimated⁵ that Australia has lost at least a billion birds, mammals and reptiles this bushfire season. This figure does not include insects, bats, fish and frogs.

Australia is at risk of losing a significant proportion of its biodiversity as a result of these bushfires and because much of Australia's biodiversity occurs only here in Australia, it's a global loss.

On this biodiversity measure alone, the scale of these bushfires is unprecedented anywhere in the world. With many species residing in already burnt or threatened areas, the impact of the fires on species extinction will be ongoing after the bushfire season.

The combination of a number of other factors also make this fire unprecedented in Australia's history. These include:

- the intensity of the fires early in Australia's fire season
- current dry, warm and windy conditions
- unusual fire behaviour

1 www.science.org.au/learning/general-audience/science-climate-change/1-what-is-climate-change

2 www.youtube.com/playlist?list=PL9DfJTxCpAXKegfD0fAOL80u8m-l9dxQO

3 www.science.org.au/news-and-events/news-and-media-releases/statement-regarding-australian-bushfires

4 www.science.org.au/news-and-events/news-and-media-releases/time-running-out-capture-australias-biodiversity-we-have-plan

5 www.science.org.au/curious/video/least-billion-animals-killed-bushfires

- the indirect and direct impact on Australia's environment, including greenhouse gas emissions and severe air pollution across population centres.

Academy's response to the bushfires

February 28, 2020



Academy Chief Executive Anna-Maria Arabia (far left) attended a roundtable of peak bodies and government ministers in January.

The Academy is actively responding to this season's bushfires through its Fellows and its capabilities in policy and communications.

Expert advice to government

In January the Academy participated in two government roundtables. The **first meeting**⁶ was with peak bodies including CSIRO and the Bushfire and Natural Hazards CRC, and the Prime Minister, the Minister for Industry, Science and Technology, and other senior government ministers. The Academy welcomed the strong agreement about the need to have a science-informed approach to bushfire recovery, adaptation and building resilience.

The **second meeting**⁷ was with the Minister for the Environment, Sussan Ley, and focused on strategies on wildlife and habitat recovery. It included Academy Fellows Professor Helene Marsh, Professor David Lindenmayer and Professor Chris Dickman. Academy Chief Executive Anna-Maria Arabia attended both roundtables.

The roundtables are providing policy feedback to the government and helping to guide the government's bushfire responses.

The Academy is currently using its collective expertise to further develop a range of bushfire-related information, advice and events to help inform future policy and decisions.

Reaching a broad audience

Videos for media and social media

This season, in addition to several climate-related videos, the Academy has produced four videos for a general audience directly related to the bushfires:

- **Smothered by smoke: how to cope**⁸
(43,000 views on Facebook)
- **How bushfires can make their own weather**⁹
(153,000 views on Facebook)
- **At least a billion animals killed in bushfires**¹⁰
(98,000 views on Facebook)
- **Hazard reduction burns: the facts**¹¹
(45,000 views on Facebook)

Fellows interviewed in the media

Ecologists Professor David Lindenmayer and Professor Chris Dickman

Media releases

The Academy released a **statement regarding Australian bushfires**¹² by President Professor John Shine, which was widely covered by national media and by mid February had resulted in 230,000 visits to the web page. The Academy followed up with an explanation of **why the Australian bushfires are unprecedented**¹³.

Celebrate science and challenge your thinking at Science at the Shine Dome

February 28, 2020

Register now for Science at the Shine Dome, 26–28 May

One of Australia's most exciting events on the scientific calendar will take place on 26–28 May when the Academy holds its annual three-day convergence.

6 www.minister.industry.gov.au/ministers/karenandrews/media-releases/ministerial-statement-bushfire-science-roundtable

7 minister.awe.gov.au/ley/media-releases/round-table-focuses-science-wildlife-recovery

8 www.science.org.au/curious/video/smothered-smoke-how-cope

9 www.science.org.au/curious/video/how-bushfires-can-make-their-own-weather

10 www.science.org.au/curious/video/least-billion-animals-killed-bushfires

11 www.science.org.au/curious/video/hazard-reduction-burns-facts

12 www.science.org.au/news-and-events/news-and-media-releases/statement-regarding-australian-bushfires

13 www.science.org.au/news-and-events/news-and-media-releases/australian-bushfires-why-they-are-unprecedented

Science at the Shine Dome¹⁴ is a national celebration of outstanding achievements in science, including welcoming new Fellows to the Academy and presenting Academy awards to leading researchers.

Registrations are now open¹⁵ for Science at the Shine Dome. Attendees can register to attend part or all of the three-day event—see the program for more information.



It's impossible not to meet new people at Science at the Shine Dome.

Science and the Public Good symposium

The event includes a one-day symposium that is designed to challenge conventional thinking and stimulate change. This year's hot topic is **Science and the Public Good**¹⁶, featuring an exciting line-up of Australian and international speakers who will explore the critical importance of studying mathematics, chemistry, biology and physics, and how this fundamental knowledge is essential to scientific advances. Speakers will also tackle some big questions, such as where should we focus our efforts and resources? How do we set boundaries for scientific discovery while allowing the freedom to take risks? And how can people have a say in the future of science?



Professor Naomi Oreskes from Harvard University is the symposium's opening speaker.

The symposium will also be livestreamed around the world—secondary schools, universities,

organisations and government departments are encouraged to attend or watch live online.

Networking opportunities

Science at the Shine Dome provides valuable networking opportunities for Academy Fellows,

early- and mid-career researchers, government representatives, politicians, media, science associated organisations, and the science interested general public. There are workshops specifically designed for EMCRs, and a gala dinner that brings together many luminaries of Australian science.

"The EMCR masterclass and especially the EMCR workshop I attended was fantastic. I have been to a lot of these workshops but this was the best one yet."

Equity, diversity and inclusion are important to the Academy, and we want to ensure all delegates and speakers are able to participate fully in our events. With generous support from the University of Sydney, the Academy is able to offer a **range of assistance grants**¹⁷ to delegates and speakers who face obstacles to attend.

So don't delay, register for Science at the Shine Dome before you miss out on this unique opportunity.

Academy awards reflect the excellence and diversity in Australian science

March 03, 2020

Outstanding contributions to science have been recognised by the Australian Academy of Science today with 18 current and future superstars receiving prestigious 2020 honorific awards.

The scientists' discoveries cross the breadth of research including new screening approaches to catch the early signs of dementia; the differences between land-based and seafloor volcanic eruptions; and engineering solutions for the complex challenges associated with offshore oil, gas and renewable energy infrastructure.

Ten of the awards go to women while men receive eight of the awards.

Professor Allen Nutman from the University of Wollongong has been awarded one of the Academy's top career honours, the Mawson Medal and Lecture.

¹⁴ aas.eventsair.com/2020-science-at-the-shine-dome/

¹⁵ aas.eventsair.com/2020-science-at-the-shine-dome/registration-type

¹⁶ aas.eventsair.com/2020-science-at-the-shine-dome/symposium

¹⁷ aas.eventsair.com/2020-science-at-the-shine-dome/access-and-assistance



The Australian Academy of Science's 2020 honorific awardees

He's considered one of the leaders in understanding the evolution of early Earth and his techniques have radically reshaped our understanding of Greenland's geology. He also spends time educating the next generation of scientists and said their work has never been more important.

"Unfortunately, we live increasingly in something called the post-truth world where a lie is given as equal weight as truth, so science matters," said Professor Nutman.

Understanding dark matter is the ultimate challenge for many astrophysicists including Professor Nicole Bell from the University of Melbourne. The mid-career researcher and theoretical physicist is one of two recipients of the Nancy Millis Medal for Women in Science.

Her research focuses on formulating a mathematical description of dark matter.

"We have incredibly precise theories that describe five per cent of the universe but the rest of it is unknown," said Professor Bell.

"In some sense the search for dark matter is a needle in a haystack challenge, but we've got more experimental tools than ever before to find that needle."

Early-career researcher Associate Professor Marina Pajic from the Garvan Institute of Medical

Research and UNSW Sydney is the recipient of the Ruth Stephens Gani Medal.

For the past decade she's been trying to understand the genetic complexities of pancreatic cancer. Her work centres on identifying the genomic mechanism behind treatment failure and developing new personalised treatments for the disease.

Her team has shown some tumours are characterised by specific genetic signatures that may respond to agents already being used to fight some other cancers.

President of the Australian Academy of Science, Professor John Shine, congratulated all the award winners for their inspiring research.

"Recognising outstanding scientific contributions is important, as award recipients are the STEM role models for the next generation," Professor Shine said.

"These awards shine a spotlight on the leading and diverse applied and basic research happening throughout the country.

"The Academy continues to seek to increase the diversity of nominees for all our grants and awards and this is reflected in this year's honorific awardees."

The Academy's 2020 honorific awards go to:

Career honorifics (for lifelong achievement)

- David Craig Medal—Dr Graeme Moad, CSIRO
- Haddon Forrester King Medal and Lecture—Professor Ian Campbell, ANU
- Macfarlane Burnet Medal and Lecture—Professor Marilyn Renfree, University of Melbourne (as previously announced)
- Mawson Medal and Lecture—Professor Allen Nutman, University of Wollongong

Mid-career honorifics (8–15 years post-PhD)

- Gustav Nossal Medal for Global Health—Adjunct Professor Alexandra Martiniuk, University of Sydney
- Nancy Millis Medal for Women in Science—Associate Professor Kate Schroder, University of Queensland and Professor Nicole Bell, University of Melbourne (two recipients)

Early-career honorifics (up to 10 years post-PhD)

- Anton Hales Medal—Dr Jan Zika, UNSW Sydney
- Christopher Heyde Medal—Professor Ryan Loxton, Curtin University and Dr Jennifer Flegg, University of Melbourne (two recipients)
- Dorothy Hill Medal—Dr Rebecca Carey, University of Tasmania
- Fenner Medal—Associate Professor Michael Bode, Queensland University of Technology
- Gottschalk Medal—Associate Professor Muireann Irish, University of Sydney
- John Booker Medal—Associate Professor Britta Bienen, University of Western Australia
- Le Fèvre Medal—Associate Professor Ivan Kassal, University of Sydney
- Ruth Stephens Gani Medal—Associate Professor Marina Pajic, Garvan Institute of Medical Research/UNSW Sydney
- Pawsey Medal—Associate Professor Adam Deller, Swinburne University of Technology

- Frederick White Medal—Professor Madhu Bhaskaran, RMIT University

The majority of the honorific awards will be presented at the Academy's annual celebration of science, **Science at the Shine Dome on Thursday, 28 May 2020**¹⁸.

Read more about each of the Academy's 2020 honorific awardees¹⁹

Know an amazing Australian scientist? Nominate them for an award

Nominations are now open²⁰ for the Academy's 2021 honorific awards, research conferences, research awards and travelling fellowships.

Two brand new career awards are open in the Academy's 2021 award round. These awards, the **Ruby Payne-Scott Medal and Lecture**²¹ and the **Suzanne Cory Medal**²², honour two of Australia's pioneering women scientists.



Watch on YouTube: https://youtu.be/aD_96YwccV4

Academy announces Indigenous travelling scientist awards

February 19, 2020

Dr Michael-Shawn Fletcher and Mr Frank Loban are the recipients of the Australian Academy of Science Aboriginal and Torres Strait Islander Scientist Travelling Research Award for 2020.

Dr Fletcher, a senior lecturer at the University of Melbourne, will use the award to 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.

¹⁸ aas.eventsair.com/2020-science-at-the-shine-dome/

¹⁹ www.science.org.au/opportunities-scientists/recognition/honorific-awards/honorific-awardees/2020-awardees

²⁰ www.science.org.au/supporting-science/awards-and-opportunities

²¹ www.science.org.au/supporting-science/awards-and-opportunities/ruby-payne-scott-medal-and-lecture-women-science

²² www.science.org.au/supporting-science/awards-and-opportunities/suzanne-cory-medal

Lake sediment cores provide a natural archive or ecological record of what happens before, during and after times of environmental change—including changes in the rainfall associated with summer monsoons over northern Australia and South-East Asia over the past 1,000 years.

Dr Fletcher is aiming to use lake sediment cores to help track the response of the East Australian Summer Monsoon to changes in solar radiation during the Little Ice Age. There is strong evidence that the monsoon failed to reach northern Australia during this time, having a profound impact on the people and vegetation of the region.

Mr Loban, a PhD student at James Cook University, will use the award to 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.

“The key objective of my project is to investigate existing national and international research knowledge on the management of fisheries that have recognised Indigenous interests, how this knowledge interfaces with commercial enterprises, and sustains the health of the fisheries and the cultural traditions of the Indigenous people,” Mr Loban said.

The 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.

The award is part of the Academy’s national effort to champion diversity and inclusion in the sciences and empower the next generation of scientists. This will strengthen the voice of science and support scientific excellence.

This award recognises research primarily in the natural sciences, but also supports

interdisciplinary and socio-cultural research that incorporates the social sciences and humanities. Applications are now open for the 2021 award. **More information about the award**²³.

2020 J G Russell and Douglas and Lola Douglas awardees

February 06, 2020



(From L-R) Recipients of the 2020 J G Russell award: Dr Blanca del Rosal Rabes, Dr Annie Colebatch, Dr Laura Grogan, Dr James Baker. Winners of the 2020 Douglas and Lola Douglas Award: Dr Emily Papadimos, Ms Roxanne Jones

The Academy is proud to announce the recipients of two prestigious top-up awards, the **J G Russell Awards**²⁴ and the; **Douglas and Lola Douglas Scholarships in Medical Science**²⁵

The 2020 J G Russell Awardees

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, Swinburne University of Technology - \$7000

Dr del Rosal’s research 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

²³ www.science.org.au/opportunities/travel/travelling-fellowships/aboriginal-torres-strait-islander-scientist-travelling-research-award

²⁴ www.science.org.au/supporting-science/awards-and-opportunities/j-g-russell-award

²⁵ www.science.org.au/supporting-science/awards-and-opportunities/douglas-and-lola-douglas-scholarship-medical-science

her spectroscopy system to use laser sources, allowing her to study different fluorescent nanomaterials for use in research.

Dr Annie Colebatch, Australian National University - \$7000

Dr Colebatch's research focuses on using liquid organic hydrogen carriers (LOHCs), 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, Griffith University - \$7000

Dr Grogan's research 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, The University of Sydney - \$6940

Dr Baker studies 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.

The 2020 Douglas and Lola Douglas Awardees

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. One of her great wishes was to support young researchers and this bequest enables the Academy to help to fulfil this wish.

Ms Roxanne Jones, Australian National University - \$14,000 (over two years)

Ms Jones' research 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 and 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, Menzies School of Health Research - \$7,000 (with possibility of second year \$7,000 funding, if requested)

Dr Papadimos' research looks at understanding 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.

Nominate now for the Academy's 2021 awards

February 14, 2020



Above: Professor Laura Mackay was awarded the 2019 Gottschalk Medal by the Academy and later in the year a Prime Minister's science prize.
Watch on YouTube: <https://youtu.be/X5GtUe7isiA>

Shining a light on researchers

Nominations are now open²⁶ for the Academy's 2021 honorific awards, and applications open for support for research conferences, research awards and travelling fellowships.

26 www.science.org.au/supporting-science/awards-and-opportunities

These awards and funding opportunities shine a light on researchers who are making outstanding contributions to science and progressing the advancement of science in Australia.

The awards recognise remarkable achievements in research fields including Earth sciences, biology, physics, mathematics, chemistry, experimental biomedicine, genetics and more.

According to Dr Lara Malins, one of many award recipients featured recently in **Science Matters**²⁷ magazine, the JG Russell Award she received is more than just extra funding. “It was just really fantastic to have that support. Awards that recognise early-career researchers set them on a trajectory that helps them be more successful.”

The Academy is committed to **celebrating and supporting diversity**²⁸. It is seeking nominations of outstanding scientists from all career stages, backgrounds and genders, and strongly encourages more nominations of women for all awards, in particular the career and mid-career honorific awards.

Two new awards

Two brand new career awards are open in the Academy’s 2021 award round. These awards, the **Ruby Payne-Scott Medal and Lecture**²⁹ and the **Suzanne Cory Medal**³⁰, honour two of Australia’s pioneering women scientists.

The closing date for honorific award nominations is **1 May 2020**.

The closing date to apply for research conferences, research awards and travelling fellowships is **1 June 2020**.

Find out more about the Academy’s awards³¹, including how to nominate or apply.

Academy launches two new career awards for 2021

February 14, 2020

Two brand new career awards will form part of the Academy’s 2021 award round, honouring two of Australia’s pioneering women scientists.

Ruby Payne-Scott Medal and Lecture for women in science

The **Ruby Payne-Scott Medal and Lecture for women in science**³² recognises researchers of the highest standing in the physical and/or biological sciences.



Ruby Payne-Scott (1912–1981) was a pioneer in radiophysics and radio astronomy.

Along with the **Macfarlane Burnet**³³ and **Matthew Flinders medals**³⁴, 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. The lecture is given at an annual general meeting of the Academy and complements that of the other prestigious awards.

Suzanne Cory Medal for research in the biological sciences

The **Suzanne Cory Medal**³⁵ recognises outstanding research in the biological sciences (initially excluding the applied medical sciences).

It is a career award that honours the contributions made to science by Professor Suzanne Cory AC FAA FRS who, as a molecular biologist, made major contributions to understanding the genetic causes of cancer. Professor Cory was President of the Academy from 2010 to 2014.

“I am thrilled that the Academy has named this new medal in my honour. The award enables

27 www.science.org.au/about-us/philanthropy-and-partnerships/science-matters-2019

28 www.science.org.au/about-us/diversity-and-inclusion

29 www.science.org.au/supporting-science/awards-and-opportunities/ruby-payne-scott-medal-and-lecture-women-science

30 www.science.org.au/supporting-science/awards-and-opportunities/suzanne-cory-medal

31 www.science.org.au/opportunities

32 www.science.org.au/supporting-science/awards-and-opportunities/ruby-payne-scott-medal-and-lecture-women-science

33 www.science.org.au/supporting-science/awards-and-opportunities/macfarlane-burnet-medal-and-lecture

34 www.science.org.au/supporting-science/awards-and-opportunities/matthew-flinders-medal-and-lecture

35 www.science.org.au/supporting-science/awards-and-opportunities/suzanne-cory-medal

the Academy to highlight the truly remarkable advances being made by the life sciences in our understanding and appreciation of our extraordinary world,” Professor Cory said.



Professor Suzanne Cory AC FAA FRS is a distinguished molecular biologist and former Academy President.

Both awards are made annually, and are restricted to candidates who are

normally resident in Australia and for research conducted mainly in Australia.

Find out more about the Academy’s awards³⁶, including how to nominate.

Fellows recognised in 2020 Australia Day honours

January 26, 2020



From left: Professor Robyn Williams, Professor Rachel Webster, Emeritus Professor Anthony Guttman, Dr Brian Walker and Professor Anthony Thomas

Five Academy Fellows are among the Australians recognised in the **2020 Australia Day Honours List**³⁷.

Professor Anthony Thomas received the highest honour as one of just five people Australia-wide to be appointed a Companion in the General Division of the Order of Australia (AC), which recognises ‘eminent achievement and merit of the highest degree in service to Australia or to humanity at large.’

Companion of the Order of Australia (AC)

Professor Anthony Thomas AC FAA—For eminent service to scientific education and research, particularly in the field of nuclear and particle physics, through academic leadership roles.

Officer of the Order of Australia (AO)

Dr Brian Walker AO FAA FTSE—For distinguished service to science, particularly to ecosystem ecology and research, and to professional scientific bodies.

Professor Rachel Webster AO FAA—For distinguished service to education in the field of astrophysics, to astronomical research, and to young women scientists.

Professor Robyn Williams AO FAA—For distinguished service to science as a journalist, radio presenter and author, and to education.

Member of the Order of Australia (AM)

Emeritus Professor Anthony Guttman AM FAA FTSE—For significant service to the mathematical sciences, and to education.

Gender equity conference demonstrates progress and inspires change

February 28, 2020



A conference highlight was a panel discussion featuring inspirational stories from (L to R) Dr Catriona Wallace, Professor Jenny Graves, Professor Veena Sahajwalla, Professor Caroline McMillen and Anna-Maria Arabia.

The Catalysing Gender Equity 2020 Conference, held on 20 and 21 February in Adelaide, clearly 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**³⁸ that was launched in April last year, and brought together representatives from across research, industry, education and

³⁶ www.science.org.au/supporting-science/awards-and-opportunities

³⁷ www.gg.gov.au/australian-honours-and-awards/australian-honours-lists/australia-day-2020-honours-list

³⁸ www.science.org.au/support/analysis/decadal-plans-science/women-in-stem-decadal-plan

government to celebrate success and highlight key action areas to achieve change.

Focus on challenging issues

Delegates participated in a variety of sessions, each focusing on progressing and implementing strategic recommendations and opportunities in the decadal plan. The 12 workshops focused on challenging and persistent issues such as merit, measuring success, impact of equity actions, engaging men and approaches to intersectionality.



Twelve **inspiring and exceptional changemakers**³⁹ from the STEM Women online community were enabled to attend and speak at the conference, thanks to a generous donation from

Academy Fellow Professor Michelle Coote.

Inspiring plenary speakers included the Australian Government Women in STEM Ambassador, Professor Lisa-Harvey Smith, who spoke about the need to turn actions into equity, accountability and the critical work she is undertaking to bring about change as Ambassador. Delegates also heard from the inspiring and insightful Dr Catriona Wallace, Founder and Executive Director of Flamingo AI, on the urgent need for a gender lens in the augmented age.

Another highlight was the panel discussion featuring inspirational stories from eminent women in STEM, including Academy Fellows Professor Jenny Graves of La Trobe University and Professor Veena Sahajwalla of UNSW Sydney, Academy Chief Executive Anna-Maria Arabia, Chief Scientist for South Australia Professor Caroline McMillen, and Dr Wallace.

Male Champions of Change founder Elizabeth Broderick facilitated a panel discussion featuring six leaders from the Male Champions of Change in STEM: Dr Adi Paterson of ANSTO, Dr Larry

Marshall of CSIRO, Academy Fellows Professor Brian Schmidt of the Australian National University and Professor Tanya Monro of Defence Science and Technology, Dr James Johnson of Geoscience Australia, and Dr Bronwyn Evans of Engineers Australia. The STEM leaders discussed how leadership and accountability is key to putting equity theory into practice.

Bronze Awards for SAGE members

The conference coincided with the **2020 SAGE Awards dinner**⁴⁰ that celebrated the 11 recent recipients of the Athena SWAN Institutional Bronze Awards. These awards recognise an institution's commitment to advancing the careers of women, trans and gender diverse individuals in science, technology, engineering, maths and medicine. Forty-five Australian higher education and research institutions have completed the SAGE pathway to accreditation so far, with 39 of these organisations being awarded the Athena Swan Institutional Bronze Award.

Catalysing Gender Equity 2020 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.



In summing up, Academy Chief Executive Anna-Maria Arabia said that "Inclusion is a shared responsibility—not just the organisations and leaders and programs, but individual responsibility". The Academy looks forward to working with all organisations to progress the outcomes from the event and fulfill the vision of the Women in STEM Decadal Plan.

39 www.science.org.au/news-and-events/news-and-media-releases/meet-our-stem-women-changemakers

40 www.sciencegenderequity.org.au/news/media-release-australias-higher-education-and-research-sector-a-national-leader-in-eliminating-gender-and-diversity-bias/



The winners of the STEM Women Changemakers grant. From L-R: Catherine Royans, Dr Emma Camp, Jerusha Mather, Jessie Panazzolo, Dr Kirsty Nash, Dr Mary McMillan, Professor Tanya M. Smith, Tishiko King, Ruwangi Fernando, Associate Professor Muireann Irish, Dr Momeneh Foroutan, and Dr Marit Kragt

Meet our STEM Women Changemakers

January 24, 2020

The Academy has announced its inaugural group of twelve STEM Women Changemakers.

From start-up founders to organisational advocates, these women are using their knowledge, experience and networks to share their ideas and solutions for gender equity in Australian science, technology, engineering and mathematics (STEM).

The STEM Changemakers are:

- **Dr Emma Camp**⁴¹, DECRA Research Fellow, University of Technology Sydney—who is also the recipient of the Academy's **2020 Max Day Environmental Science Fellowship Award**⁴².
- **Ruwangi Fernando**⁴³, Founder of STEM Sisters
- **Dr Momeneh Foroutan**⁴⁴, Research Fellow in Computational Cancer Immunotherapy at Monash University
- **Associate Professor Muireann Irish**⁴⁵, ARC Future Fellow at the University of Sydney
- **Tishiko King**⁴⁶, Community Support Officer at Indigenous Women in Mining and Resources Australia

- **Dr Marit Kragt**⁴⁷, Associate Professor at the University of Western Australia
- **Jerusha Mather**⁴⁸, Phd Candidate at Victoria University
- **Dr Mary McMillan**⁴⁹, Senior Lecturer in Biomedical Science at the University of New England
- **Dr Kirsty Nash**⁵⁰, Founder of aKIDemic Life
- **Jessie Panazzolo**⁵¹, Founder of Lonely Conservationists
- **Catherine Royans**⁵², Swift Program Coordinator at the University of Adelaide
- **Professor Tanya M. Smith**⁵³, Professor at Griffith University

Thanks to the generous donation by Professor Michelle Coote of her Georgina Sweet Fellowship, the group will be supported to attend **Catalysing Gender Equity 2020**⁵⁴, a two-day outcome-driven conference in February guided by the **Women in STEM Decadal Plan**⁵⁵.

More information about the STEM Changemakers can be found on STEM Women, an online directory of women in Australia working in STEM.

STEM Women aims to promote gender equity in STEM by enabling a diverse range of women to

41 www.stemwomen.org.au/profile/emma-camp

42 www.science.org.au/news-and-events/news-and-media-releases/marine-researchers-receive-max-day-awards

43 www.stemwomen.org.au/profile/ruwangi-fernando

44 www.stemwomen.org.au/profile/momeneh-foroutan

45 www.stemwomen.org.au/profile/muireann-irish

46 www.stemwomen.org.au/profile/tishiko-king

47 www.stemwomen.org.au/profile/marit-kragt

48 www.stemwomen.org.au/profile/jerusha-mather

49 www.stemwomen.org.au/profile/mary-mcmillan

50 www.stemwomen.org.au/profile/kirsty-nash

51 www.stemwomen.org.au/profile/jessie-panazzolo

52 www.stemwomen.org.au/profile/catherine-royans

53 www.stemwomen.org.au/profile/tanya-m-smith

54 www.science.org.au/news-and-events/events/catalysing-gender-equity-2020

55 www.science.org.au/support/analysis/decadal-plans-science/women-in-stem-decadal-plan

be offered exciting opportunities to progress their careers and personal capabilities.

More than 2300 women have joined **STEM Women**⁵⁶ and a broad range of people and organisations are using the resource to showcase and access the depth of talent of those working in the field.

Professor Lisa Kewley awarded 2020 James Craig Watson Medal

January 23, 2020



Academy Fellow Professor Lisa Kewley

Academy Fellow Professor Lisa Kewley has been named as the recipient of the 2020 James Craig Watson

Medal by the National Academy of Sciences in Washington DC for her pioneering contributions to the study of galaxy formation and evolution.

She is the first person in Australia and the Southern Hemisphere to be recognised with the major US award in its 133-year history. Professor Kewley is the director of ARC Centre of Excellence for All Sky Astrophysics in 3D (ASTRO 3D) and ARC Laureate Fellow at ANU's Research School for Astronomy and Astrophysics.

Widely cited by astronomers around the world, she produced the first models for star-forming galaxies to include a variable galactic temperature and density distribution, developed theoretical models to identify galactic power sources, and investigated oxygen distribution left by colliding galaxies, among many other accomplishments.

Professor Lister Staveley-Smith, chair of the Academy's National Committee for Astronomy, noted that "Professor Kewley is one of Australia's leading astronomers, and in recognition of her contributions to the discipline in this country, the Australian Academy of Science elected her as a Fellow in 2014.

"She was appointed chair of the National Committee for Astronomy from 2016 – 2018. In December 2019, Nature Astronomy published her article, **Diversity and inclusion in Australian**

astronomy⁵⁷, highlighting equity programs in Australia that are having an important impact."

She is currently looking at the oxygen history of galaxies like the Milky Way.

In an ASTRO 3D press release, Professor Kewley said that advances in technology have made it a 'golden era' for astronomy.

"Early in my career, I benefited from the Hubble Space Telescope and the 10 metre Keck telescopes in Hawaii.

"Students starting today are going to have access to amazing new telescopes including the James Webb Space Telescope, massive new optical telescopes in Chile and the Square Kilometre Array in Australia and South Africa. We're going to require astronomers, engineers, data experts and artificial intelligence to use these new instruments, taking us back to the moment of the Big Bang, finding new planets and more."

The National Academy of Sciences presents the James Craig Watson Medal every two years for outstanding contributions to the science of astronomy. She will receive the award on 26 April during the National Academy of Sciences' 157th annual meeting. Winners receive a gold-plated bronze medal, a \$25,000 prize, and \$50,000 to support the recipient's research. It was established by NAS Member and Canadian–American astronomer, James Craig Watson.

Changing our attitude to 'waste'

March 01, 2020

Australians must start treating waste as a resource rather than a problem, says recycling science expert Professor Veena Sahajwalla.

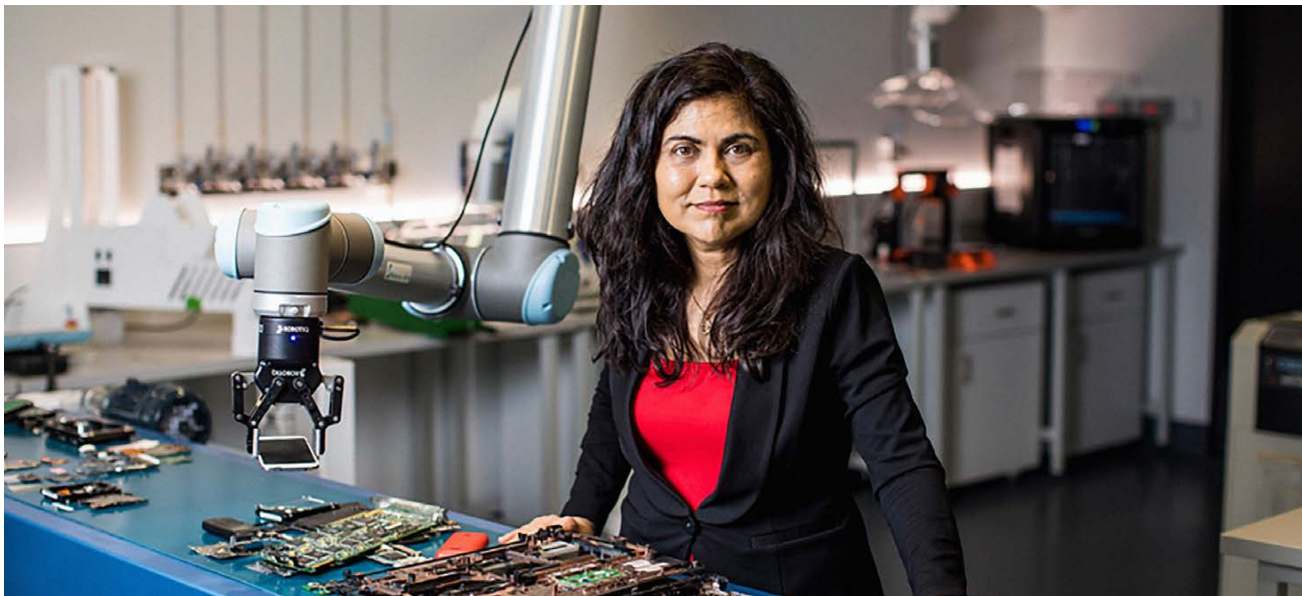
In a **feature published today**⁵⁸ Professor Sahajwalla welcomed plans by Federal and State Governments to develop a so-called 'circular economy' but said Australians also need to change the way we think about waste.

The role of science to help drive a circular economy is just one of the issues that will be explored in a new initiative, Science for Australians, launched today by the Australian Academy of Science.

⁵⁶ www.stemwomen.org.au/

⁵⁷ www.nature.com/articles/s41550-019-0954-1

⁵⁸ www.science.org.au/curious/policy-features/when-going-around-circles-way-forward



Professor Veena Sahajwalla. Credit: Anna Kucera, UNSW Sydney

“Australians may be shocked to know that on average we each generate 2.7 tonnes of waste each year,” says Professor Sahajwalla, who is Director, Centre for Sustainable Materials, Research and Technology (SMART) at UNSW Sydney and Director of the NSW Circular Economy Innovation Network.

“But waste doesn’t mean rubbish! Among all that waste is an opportunity to reuse, recycle and reform the materials and products we no longer use for new applications.”

Professor Sahajwalla – who joins 200 leaders in Canberra tomorrow (Monday 2 March) for a national summit to discuss Australia’s plastic waste problem and identify new solutions to the challenge – has developed breakthrough micro-recycling technologies to reform waste into new materials and products.

Academy President Professor John Shine AC PresAA said the *Science for Australians* series will highlight how science benefits all Australians and how it can be used to inform policy.

“Australians are looking for trustworthy information and answers for how science can help in these challenging times we are facing as a nation. This is reflected in a record-breaking near 250,000 unique users to our website in January.”

The initiative will also include a series of features for policy makers to highlight the conditions that are needed to make science thrive in Australia.

“Globally STEM will play an increasingly important role in industry, in the economy and in the way

communities shape their future. It is important that an environment is created within which we can support our scientific workforce, remain globally competitive, and ensure science and industry have the tools they need to work together and prosper,” says Professor Shine.

“As part of the initiative, the Academy will also invite discussion about issues that are important to building the capacity of science to support Australia now and into the future.”

Other topics to be explored in the Academy’s *Science for Australians* series include: How can science make our energy requirements more sustainable? Is gene editing food crops the only way to feed the population? How do we advance communications technologies and ensure national security is not compromised?



Watch on youtube: youtu.be/5owiuyq8BOI



The Shine Dome, Academy staff cars, and Ian Potter House (not in photo) were severely damaged by the hail storm.

Canberra's iconic landmark damaged in hailstorms

January 21, 2020

Australia's top scientists are counting the cost of yesterday's hailstorms after Canberra landmark the Shine Dome sustained serious damage during the extreme weather event.

The hailstorm 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.

The archives include the collections of some of Australia's most famous scientists, including Australian Academy of Science Fellow, Frank Fenner best known for overseeing the eradication of smallpox, and the control of Australia's rabbit plague.

The Frank Fenner manuscript collection was added to the UNESCO Australian Memory of the World Register in 2019⁵⁹.

The archives also include the collection of Frank Leslie Stillwell, a geologist who formed part of the Australasian Antarctic Expedition led by Sir Douglas Mawson in 1911.

Australian Academy of Science Chief Executive Anna-Maria Arabia said there was no damage to the archives thanks to a rescue effort by staff, who formed a human chain to move the boxed archives to safety.

"The extreme weather events of the past few months have demonstrated that fire and storm damage are real and present dangers and this incident has highlighted the urgent need to accelerate the digitisation of this significant and unique historical collection," Ms Arabia said.



(from left) Large hail caused pitting on the copper roof of the Shine Dome; a broken skylight in the Shine Dome; and one of many broken windows in Ian Potter House.

59 www.science.org.au/academy-newsletter/march-2019-125/academys-fenner-collection-listed

“The Academy is the only place in the world that holds these scientific collections and we continue to receive strong global interest to access the archives, with historians and researchers regularly visiting Canberra to access them.

“The Academy has been fundraising to have the archives digitised but we have not yet met our target of at least \$10 million to achieve this,” Ms Arabia said.

Donate to support digitisation of the archives⁶⁰

The Australian Academy of Science’s historic Ian Potter House, where staff are based, also suffered extensive damage, with dozens of windows smashed, rendering the building unsafe for staff for the immediate future. Ian Potter House was placed on the ACT Heritage Register in 1998.

The vehicles of 34 staff were also severely damaged by the hailstorm and were unable to be driven home.

Regional researchers gain valuable skills in Armidale

February 28, 2020

Early- and mid-career researchers (EMCRs) working in regional areas were recently provided with a valuable opportunity for professional

development and networking at the Academy’s Empowering Regional Research conference.

The two-day event held in February at the University of New England in Armidale NSW was designed to empower researchers from regional institutions with the tools needed to build successful careers. The attendees engaged in sessions on honing their writing and communication skills, learning how to work with the media and building their leadership skills.

Across the two days, the 60 EMCRs also joined discussion groups on the challenges faced by researchers in regional and remote areas, on working towards increasing diversity in their workplaces and how they can create a stronger more unified voice.

Empowering Regional Research was the last event of the 2019–20 round of the Theo Murphy Initiative and received support from the University of New England. The Theo Murphy Initiative (Australia) supports activities which provide tangible benefits to Australia’s EMCR community, with the overall goal of furthering scientific discovery.

The activities to be delivered as part of the new round of the Theo Murphy Initiative will be announced in the coming months.



Regional researchers got together in Armidale NSW to build their professional skills. The conference was a Theo Murphy Initiative event and was supported by the University of New England.

60 www.science.org.au/donate

Interest in history of Australian science reflected in Academy's journal

February 19, 2020

Contributed by the journal's Editors, Dr Sara Maroske and Professor Ian Rae

The January issue of the Academy's journal, **Historical Records of Australian Science**⁶¹, is rich with science policy, exemplified in two biographical memoirs and another article arising from on-going work on the history of CSIRO.

Entomologist Max Day (1915–2017) was an early enthusiast for conservation, representing Australia at international forums and leading the Academy to become involved in concern for the environment as a cross-disciplinary exercise. Botanist and plant ecologist Ralph Slatyer (1929–2012) contributed to environmental studies in Australia and as Australia's ambassador to UNESCO. He is remembered for his role as Australia's first chief scientist, when he oversaw the establishment of the cooperative research centres.



The biographical memoir of entomologist Max Day features in the latest edition of **Historical Records of Australian Science**.

History of CSIRO

Garrett Upstill and Tom Spurling at Swinburne University are leading a project to assemble and analyse material that describes and explains the history of CSIRO. This issue features the way that CSIRO engaged with Australian industry in the late twentieth century. To some extent this role was forced on them by a requirement that they derive as much as 30% of their funding from non-government sources, which led to technology transfers, joint ventures and the growth of personal contacts.

There is no doubt that the dominant scientific figure of nineteenth-century Australia was Ferdinand von Mueller. The 'Mueller project' has produced several books and many scholarly

articles, and in this issue Ian Rae and Sara Maroske write about the phytochemical laboratory that Mueller established in Melbourne, and the chemists he engaged to work there.

Graeme Cohen follows his book on the people, organisations and institutions of Australian mathematics with a bibliography of Australian mathematics books and pamphlets up to 1960 with insightful comments on the authors and their intended readerships.

The richness of scholarly interest in history of Australian science is reflected in the articles in this issue, in the book reviews—written by leading historians and compiled by Peter Hobbins—and in the 40th edition of the bibliography of history of Australian science, compiled by Helen Cohn and covering the twelve months to September 2019.

The Academy publishes the biographical memoirs on its website after a period following publication in the journal. Academy Fellows can access all the journal's content for free through the Fellows' page on our website.

Opportunities for scientists—February 2020

February 28, 2020

Academy awards and funding opportunities

Nominations are now open⁶² for the Academy's 2021 honorific awards, research conferences, research awards and travelling fellowships.

The Academy is committed to **celebrating and supporting diversity**⁶³. It is seeking nominations of outstanding scientists from all career stages, backgrounds and genders, and strongly encourages more nominations of women for all awards, in particular the career and mid-career honorific awards.

Two new career awards are the **Ruby Payne-Scott Medal and Lecture**⁶⁴ and the **Suzanne Cory Medal**⁶⁵.

The closing date for **honorific award nominations is 1 May 2020**.

The closing date to apply for **research conferences, research awards and travelling fellowships is 1 June 2020**.

61 www.publish.csiro.au/hr

62 www.science.org.au/news-and-events/news-and-media-releases/nominate-now-academys-2021-awards

63 www.science.org.au/about-us/diversity-and-inclusion

64 www.science.org.au/supporting-science/awards-and-opportunities/ruby-payne-scott-medal-and-lecture-women-science

65 www.science.org.au/supporting-science/awards-and-opportunities/suzanne-cory-medal

External awards

2020 Keio Medical Science Prize

Awarded in the fields of basic medicine, clinical medicine, or life sciences closely related to medicine—10 million yen

More information on the 2020 Keio Medical Science Prize⁶⁶

Applications close 7 March 2020

Prime Minister's Prizes for Science

Nominations sought for Australia's national science and teaching awards: total pool of \$750,000 in prize monies and an embossed medallion and lapel pin.

- The Prime Minister's Prize for Science
- The Prime Minister's Prize for Innovation
- The Frank Fenner Prize for Life Scientist of the Year
- The Malcolm McIntosh Prize for Physical Scientist of the Year
- Prize for New Innovators
- The Prime Minister's Prize for Excellence in Science Teaching in Primary Schools
- The Prime Minister's Prize for Excellence in Science Teaching in Secondary Schools

More information on the Prime Minister's Prizes for Science⁶⁷

Applications close 12 March 2020

The World Academy of Sciences (TWAS) Awards 2020

Awarded to individual scientists who have been working and living in a developing country for at least 10 years in the fields of agricultural sciences, biology, chemistry, earth, astronomy and space sciences, engineering sciences, mathematics, medical sciences, physics and social sciences—US\$10,000 each

More information on TWAS Awards⁶⁸

Applications close 16 March 2020

The World Academy of Sciences (TWAS) Siwei Cheng Award in Economic Sciences

Recognising economic scientists who have been working and living in a developing country for at least 10 years—US\$10,000.

More information on the TWAS Siwei Cheng Award⁶⁹

Applications close 16 March 2020

King Faisal International Prize

Prizes in different fields of science and medicine—US\$200,000.

More information on the King Faisal International Prize⁷⁰

Applications close 31 March 2020

See more external awards and prizes⁷¹

Fellows update—February 2020

February 28, 2020

Honours and awards to Fellows

Australia Day 2020 Honours

Professor Anthony Thomas AC FAA— Companion of the Order of Australia (AC) for eminent service to scientific education and research, particularly in the field of nuclear and particle physics, through academic leadership roles

Dr Brian Walker AO FAA FTSE— Officer of the Order of Australia (AO) for distinguished service to science, particularly to ecosystem ecology and research, and to professional scientific bodies

Professor Rachel Webster AO FAA— Officer of the Order of Australia (AO) for distinguished service to education in the field of astrophysics, to astronomical research, and to young women scientists

Professor Robyn Williams AO FAA— Officer of the Order of Australia (AO) for distinguished service to science as a journalist, radio presenter and author, and to education

Emeritus Professor Anthony Guttmann AM FAA FTSE— Member of the Order of Australia (AM) for

66 www.ms-fund.keio.ac.jp/en/

67 www.business.gov.au/Grants-and-Programs/Prime-Ministers-Prizes-for-Science

68 twas.org/opportunity/twas-awards

69 twas.org/opportunity/twas-siwei-cheng-award-economic-sciences

70 kingfaisalprize.org/en/

71 www.science.org.au/supporting-science/recognition/external-sources-recognition

significant service to the mathematical sciences, and to education

More about these awards⁷²

More honours and awards

Professor Lisa Kewley FAA—James Craig Watson Medal from the National Academy of Sciences for outstanding contributions to the science of astronomy. **More about Professor Kewley's award**⁷³

Professor Marilyn Renfree AO FAA—Marshall Medal from the Society for Reproduction and Fertility for outstanding contributions to the study of fertility and reproduction

Professor Stephen Powles FAA FTSE—BASFI Industry Award for his contribution to the Australian agriculture and farming sectors

Dr Surinder Singh FAA FTSE—Australasian Section of the American Oil Chemists Society Award for Scientific Excellence in Lipid Research

Professor Andrew Holmes AC FAA FRS FTSE—Honorary Doctorate of Science from Curtin University

Professor Melissa Little FAA—Julian Wells Medal for outstanding contribution to genome research in Australia

Obituaries



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

Professor Gerry Wake was a biochemist elected to the Academy in 1985

for his pioneering work in bacterial cell division. He was known for the clarity of his reasoning and he made seminal contributions to milk protein chemistry and to a series of fundamental discoveries concerning the mechanism of bacterial chromosome replication.

His work included a break-through in the understanding of multi-forked chromosomes and he published the definitive work of bidirectionality of DNA replication. Professor Wake also

participated in one of the earliest demonstrations of in vitro semi-conservative replication of DNA polymerase and he provided the earliest conclusive evidence for concatamers of the chromosome of bacteriophage lambda.

Professor Wake gave his time generously to the Academy. He served on Council and as Vice-President, and was active on many committees.



Emeritus Professor Lewis (Lew) Norman Mander AC FAA
FRS Hon FRSNZ

8 September 1939 to 8 February 2020

Professor Lew Mander was an internationally renowned organic chemist elected to the

Academy in 1983 (at the age of just 43) for his total synthesis of a number of natural products which pose particular difficulties. Using innovative strategies, his outstanding synthesis of the family of plant hormones called gibberellins has been described as a brilliant landmark achievement. A successful objective of the gibberellin work is to illuminate relations between structure and biological activity, using structurally modified analogues, and to provide specific isotope labelled compounds as probes for biological investigation.

For this dauntingly complex work and his other advances, Professor Mander received international acclaim including election as a Fellow of the Royal Society of London and as an Honorary Member of the Royal Society of New Zealand. He received a NAITO Foundation Fellowship, University of Tokyo and was made an Eminent Scientist of RIKEN, Saitama, Japan. The numerous prizes, honours and lectureships that Professor Mander received include the Flintoff Medal and Prize from the Royal Society of Chemistry and the Royal Society of Chemistry's Industrial Award for Synthetic Organic Chemistry.

Professor Mander was a Nuffield Commonwealth Fellow at Cambridge University, after which he was based at the Research School of Chemistry at the Australian National University and was appointed Dean from 1981 to 1995. From July

⁷² www.science.org.au/news-and-events/news-and-media-releases/fellows-recognised-2020-australia-day-honours

⁷³ www.science.org.au/news-and-events/news-and-media-releases/professor-lisa-kewley-awarded-2020-james-craig-watson-medal

1986 to January 1987 he was a Visiting Scholar at Harvard. In 2018, he was made a Companion of the Order of Australia for his outstanding service to science.

Professor Mander gave his time generously to the Academy. He served on Council and was active on many committees.



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

Professor Ray Martin was an inorganic chemist elected to the Academy in 1971 for

his major work on the magnetism and structure of transition element compounds. His early magnetic studies on copper acetate and related compounds first drew attention to the copper–copper interactions that was one of the starting points of the widespread interest in metal–metal bonds.

Following completion of his PhD in Cambridge in 1952, Professor Martin became senior lecturer at UNSW. He then worked at Imperial Chemical Industries, after which he was appointed Professor and Head of Inorganic Chemistry at the University of Melbourne, where he helped set up the Inorganic Department. He moved to the Australian National University as Foundation Professor of Inorganic Chemistry and then Dean of the Research School of Chemistry. Professor Martin was appointed Vice-Chancellor of Monash University and was a Professor of Chemistry. He was also Chair of the Australian Science and Technology Council and a member of the Science Council.

Professor Martin received numerous prizes and awards throughout his career, including RACI's HG Smith Medal in 1968 and its Leighton Memorial Medal in 1990. He received an Honorary DSc from the Australian National University, an Honorary Doctor of Laws from Monash and an Honorary DSc from the University of Melbourne. Professor Martin was appointed an Officer in the

Order of Australia in 1987 for services to science and higher education.

Professor Martin gave his time generously to the Academy. He was active on many committees including the National Committee for Chemistry, and was **interviewed for the Academy**⁷⁴ by Professor Bruce Holloway in 2008.

Professor Martin's father, Sir Leslie Harold Martin CBE FAA FRS, was a Foundation Fellow of the Academy.

Coming events



Science at the Shine Dome 2020 26–28 May 2020

Science at the Shine Dome is a three-day event in May each year where Australia's most influential scientists gather at the Shine Dome in Canberra to celebrate science and to honour outstanding achievements in science.

Science at the Shine Dome is an event for researchers from all disciplines and career levels to come together and share knowledge. This includes the admission of new Fellows to the Australian Academy of Science, national awards to honour excellence at all career levels, a networking gala dinner with industry and political representatives, and a high-powered symposium on an issue of national importance. A major focus at Science at the Shine Dome is giving early- and mid-career researchers professional development and the opportunity to engage with senior scientists.

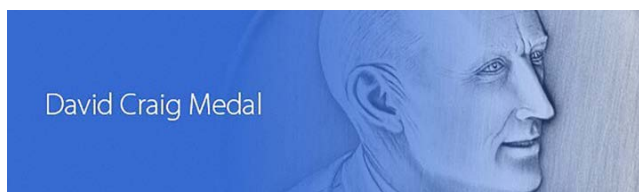
Science at the Shine Dome attracts a national and international audience of over 400 people and boundless networking opportunities with Australian Academy Fellows, chief scientists, Nobel Prize winners, early and mid-career researchers, government representatives, politicians, media, science associated organisations, and the science interested general public. Online, Science at the Shine Dome

74 www.science.org.au/learning/general-audience/history/interviews-australian-scientists/professor-ray-martin-physical-inorganic-chemist

reaches audiences of over 500,000 people on a range of social media and digital technology platforms to make the event truly global in every sense.

Join us to celebrate the excellence of Australian science!

Visit the **event website**⁷⁵ for more information and to register.



Quantum Chemistry: The Good, the Bad and the Ugly

12:00 PM March 13 - 1:00 PM March 13, 2020

About the talk

Quantum Chemistry occupies the Fertile Crescent where Mathematics, Physics, Chemistry and Computer Science meet. Several Nobel Prize in Chemistry (1954, 1966, 1981, 1998, 2013) have been awarded for major advances in the field but a number of formidable theoretical and computational challenges remain unsolved.

After presenting a bird's-eye view of the subject and its achievements during the past 50 years, Professor Gill will discuss some of those challenges and argue that research in the field is trifurcating into three philosophically distinct branches. All three aim to exploit the staggering potential of next-generation computers, but each is guided by a different set of scientific priorities.

About the speaker

Professor Peter Gill *FAA*

Schofield Professor of Theoretical Chemistry
University of Sydney



Professor Peter Gill received his PhD, on hemi-bonded systems and their dicationic analogues, from the Research School of Chemistry at the

Australian National University in 1988. He then moved to Carnegie-Mellon University where he was one of the early developers of density

functional theory (DFT) in the chemical community. He held positions at Massey University, the University of Cambridge, and the University of Nottingham before returning to ANU in 2004. He has been awarded the Dirac and Schrödinger Medals of the World Association of Theoretical and Computational Chemists (WATOC) and the Pople and Fukui Medals of the Asia-Pacific Association of Theoretical and Computational Chemists (APATCC). He has published almost 200 papers attracting more than 13,000 citations (Web of Science) and 135,000 citations (Google Scholar). He is the president of WATOC and the founder and president of the quantum chemistry software company Q-Chem Inc.



Food for Thought: Edible Insects

5:30 PM April 01 - 7:30 PM April 01, 2020

Intrigued by eating insects? You've come to the right place. Take a scientific and culinary journey in a workshop that's sure to get you thinking.

Professor Kerry Wilkinson from the University of Adelaide will join local producers of edible insects to chat about how and why they're increasingly on the menu. From native green ant gin to cricket pasta, appetites for this alternative protein source are growing.

Food for Thought will begin with drinks and canapés before the workshop gets under way. Tastings will be offered throughout; come with an open mind and discover something new.

Professor Wilkinson and her university colleagues are working with the CSIRO to find the best Australian insects for commercial production and create new trade opportunities. The global edible insect industry is tipped by the UN to be worth \$1.5 billion over the next four years, along with improving food security and reducing waste.

⁷⁵ aas.eventsair.com/2020-science-at-the-shine-dome/

FOOD FOR THOUGHT



Food for Thought: GM foods

5:30 PM April 14, 2020

What's the difference between a selectively bred banana and a banana that has been genetically engineered?

From enhanced nutrition to pesticide resistance, GM has the potential to transform agriculture. As the world's population balloons and the impacts of climate change become keenly felt by farmers, we will need tools that help us nourish more people more efficiently. Will GM be one of them?

While the science may be sound, the practicalities of GM evoke diverse public opinions: from philosophical considerations about changing DNA to concerns about the involvement of multinational corporations.

Separate fact from fiction with two leading experts on the science and ethics of genetic modification (GM). We will learn about the cutting-edge GM research currently happening in Australia alongside perspectives on ethics and safety.

Dr Surinder Singh FAA is a world-leading researcher in plant oil engineering based at CSIRO. He and his team made a breakthrough by genetically engineering a canola crop that has the same oil profile as fish oil—creating a sustainable source of healthy omega-3.

Professor Rachel Ankeny is an interdisciplinary researcher at the University of Adelaide. Her work intersects with bioethics, food studies, science policy and the history and philosophy of science. Rachel's major ongoing project is called 'Organisms and us: How living things help us to understand our world'.

This is the second event in a six-part series. Throughout this series, experts from around Australia, will cover a range of topics relating to food and nutrition, including food waste, gut health, Australian native foods, edible insects, GM foods, the future of nutrition and more! **Visit the series page**⁷⁶ for more information and tickets to other talks.

Date: Tuesday 14 April 2020

Time: 5.30pm–7.00pm. Refreshments served from 5.30pm, with the talk 6.00pm–7.00pm.

Location: The Shine Dome

Price: \$75 for a season pass, \$15 for single tickets

Food for Thought: Gut health

5:30 PM June 09, 2020

Forget mind control—gut control is the new frontier. A growing body of evidence suggests that gut health plays a significant role in mental health and vice versa: what you eat is what you feel.

Beyond food and mood, what do you eat when your bowels act funky? Diet can play a part in treating common gastroenterological disorders, such as the innovative Aussie-developed Low FODMAP diet, designed for sufferers of Irritable Bowel Syndrome (IBS).

Join us to discover the secret world of microorganisms living in your gut (the microbiome), the hidden connections between mind and bowel, and the effects of different foods on a range of health issues.

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Associate Professor Jane Muir is a translational nutrition researcher and trained dietitian at Monash University. Her career has focused on the role of carbohydrates in gut health, including developing laboratory techniques to quantify FODMAP (fermentable oligo-, di- and mono-saccharides and polyol) sugars in different food sources.

Dr Wolfgang Marx is a postdoctoral fellow and Head of Nutraceutical Research at Deakin University's Food and Mood Centre. His research centres on nutraceuticals—products derived from food that may provide extra health benefits—to address mental health, fatigue and cognition.

This is the third event in a six-part series. Throughout this series, experts from around Australia, will cover a range of topics relating to food and nutrition, including food waste, gut health, Australian native foods, edible insects, GM foods, the future of nutrition and more! **Visit the series page**⁷⁷ for more information and tickets to other talks.

Date: Tuesday 09 June 2020

Time: 5.30pm–7.00pm. Refreshments served from 5.30pm, with the talk 6.00pm-7.00pm.

Location: The Shine Dome

Price: \$75 for a season pass, \$15 for single tickets

⁷⁷ www.science.org.au/news-and-events/events/public-speaker-series/food-thought