

FEBRUARY 2019

NEWSLETTER

NUMBER 124



Message from the Chief Executive

February 27, 2019

Sixty-five years ago, on 16 February 1954, the Australian Academy of Science was founded by 23 distinguished scientists. Today, the Academy's Fellowship is rich and diverse, boasting 530 of Australia's most distinguished scientists who contribute their expertise for the betterment of our nation and our globe. Throughout 2019, the Academy will celebrate the many successes of science and the Academy. This year we also celebrate the **60th anniversary**

of the iconic Shine Dome¹. Look out for celebratory events in this newsletter and throughout the year.

One of the Academy's objectives is to provide independent and authoritative scientific advice to the parliament and to other decision makers. Therefore, we were very proud to be able to assemble a multidisciplinary team of scientists to examine **the causes of the mass fish deaths**² that have impacted the Darling River in and around Menindee in NSW. I commend the **final report**³, its recommendations and the accompanying summary video to you. I wish to acknowledge the extraordinary work undertaken by the expert panel in bringing together this document. Scenes of the deaths of so many fish in the iconic Murray-Darling Basin captured the attention and concerned many Australians. It is unsurprising then that this body of work undertaken by the Academy has received more media coverage than any other issue we have ever explored in our 65-year history.

It is time to nominate inspiring scientists, innovators, or science, maths or technology teachers for the **2019 Prime Minister's**

Prizes for Science⁴, Australia's most prestigious awards for outstanding achievements in scientific research, research-based innovation, and excellence in science teaching. Prize recipients share \$750,000 in prize money and have the opportunity to showcase important work undertaken in their field. Further detail is available in the February newsletter.

And finally, save the date! 28–30 May is the Academy's annual signature event Science at the Shine Dome. **Registration is now open**⁵ for this unique and inspiring celebration of science.

I hope you enjoy reading the February newsletter.

Anna-Maria



Watch the Academy 65th Anniversary Curious video:
<https://youtu.be/idZ0mG5QgII>

1 <https://www.science.org.au/node/10576>

2 <https://www.science.org.au/node/10572>

3 <https://www.science.org.au/supporting-science/science-policy-and-sector-analysis/reports-and-publications/fish-kills-report>

4 <https://www.science.org.au/node/10577>

5 <https://aas.eventsair.com/2019-science-at-the-shine-dome/>

Academy produces scientific report on Darling River fish kills

February 27, 2019

In the wake of three mass fish kills in the Darling River, the Academy has produced a scientific report examining the causes of the disaster.

In three separate events across December 2018 and January 2019, millions of fish—including endangered Murray Cod—died en masse along a 30km stretch of river near Menindee, NSW.

The Academy assembled an expert panel comprising scientists with expertise across a range of disciplines, who found that insufficient water flow was a key factor leading to the fish kills.

Read about the expert panel's work over the last month and explore their findings and recommendations in **the full report**⁶.



- Scientists lay out new plan to save the Darling River⁷
- Academy expert panel responds to findings of fish deaths assessment⁸
- Wealth of data triggers revised reporting date for Academies' expert advice on fish kills⁹
- Academy welcomes independent assessment of fish deaths¹⁰
- Panel of experts to review fish kill announced¹¹
- Academy to provide science advice on fish kill¹²

Science at the Shine Dome set to 'power up' for 2019

February 27, 2019

Registration is now open for Science at the Shine Dome, the Academy's premiere annual event. The gathering of Australia's most influential scientists will take place 28–30 May, bringing together researchers from all disciplines and career levels to share knowledge at the iconic Shine Dome in Canberra.

The three-day event will kick off with 'Power Up Australia, the sustainable way', a symposium on Tuesday 28 May, exploring the role of science in a sustainable energy future. Australia's Chief Scientist, Dr Alan Finkel AO FAA FTSE, will deliver a keynote address to open the symposium.

Newly-elected Fellows will be formally admitted to the Academy on the Tuesday evening. They will then present their work and achievements the following day.

The 2019 Gala Dinner will be held on the evening of Wednesday 29 May at the



Watch the Investigation of the causes of mass fish kills Curious video: <https://youtu.be/TkpRsY81Flg>

6 <https://www.science.org.au/supporting-science/science-policy-and-sector-analysis/reports-and-publications/fish-kills-report>

7 <https://www.science.org.au/news-and-events/news-and-media-releases/scientists-lay-out-new-plan-save-darling-river>

8 <https://www.science.org.au/node/10569>

9 <https://www.science.org.au/news-and-events/news-and-media-releases/wealth-data-triggers-revised-reporting-date-academies-expert-advice-fish-kills>

10 <https://www.science.org.au/news-and-events/news-and-media-releases/academy-welcomes-independent-assessment-fish-deaths>

11 <https://www.science.org.au/news-and-events/news-and-media-releases/panel-experts-review-fish-kill-announced>

12 <https://www.science.org.au/news-and-events/news-and-media-releases/academy-provide-science-advice-fish-kill>



(L to R) Dr Liz Dennis, Professor Ron Ekers, Emeritus Professor Brian Kennett, Professor Bruce Kemp and Professor Elaine Sadler

National Museum of Australia, offering attendees the chance to network and celebrate science.

The science celebrations will continue with award presentations on Thursday 30 May.

To register and view the full program, visit the **Science at the Shine Dome website**¹³.

Fellows recognised in Australia Day honours January 25, 2019

Five Academy Fellows are among the Australians recognised in the 2019 Australia Day Honours List.

Dr Liz Dennis received the highest honour, 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)

Dr Liz Dennis AC FAA FTSE—For eminent service to science as a researcher and academic in the area of genomics and plant development, and to professional organisations.

Officer of the Order of Australia (AO)

Professor Ron Ekers AO FAA FRS—For distinguished service to science as a radio astronomer, to scientific education, and to international astronomical organisations.

Emeritus Professor Brian Kennett AO FAA FRS—For distinguished service to the earth sciences as a leading academic and researcher, particularly in the field of seismology.

Professor Bruce Kemp AO FAA FRS—For distinguished service to biomedical research, particularly to the study of protein phosphorylation.

Professor Elaine Sadler AO FAA—For distinguished service to science as an astrophysicist, in the field of galaxy evolution, and to gender equality.

Academy Fellow appointed Chief Defence Scientist January 24, 2019

Academy Fellow Professor Tanya Monro has become the first woman to lead Australia's Defence Science and Technology. She takes up her new position as Chief Defence Scientist in March, replacing Professor Alex Zelinsky.



Watch National honours for astrophysicist
Curious video: <https://youtu.be/FEkDBiellwA>



Australia's new Chief Defence Scientist, Professor Tanya Monro, will take up her position in March.

Professor Monro is currently Deputy Vice Chancellor Research and Innovation and an ARC Georgina Sweet Laureate Fellow at the University of South Australia.

In 2012 she became one of the youngest living Fellows of the Australian Academy of Science elected for 'exceptional scientific contributions of international significance to optical glass materials and fibres, photonics and optical physics, most notably in nanophotonics for nonlinear optics and sensing'.

In the same year Professor Monro also won the Academy's **Pawsey Medal**¹⁴. Throughout her career the physicist has also been an advocate for diversity and inclusion and a champion of the Academy's **Science in Gender Equity (SAGE) initiative**¹⁵.

Professor Monro was the inaugural Director of the Institute for Photonics and Advanced Sensing (IPAS) from 2008 to 2014 and was

¹³ <https://aas.eventsair.com/2019-science-at-the-shine-dome/>

¹⁴ <https://www.science.org.au/opportunities-scientists/recognition/honoric-awards/early-career-awards/pawsey-medal>

¹⁵ <https://www.sciencegenderequity.org.au/>

also the inaugural Director for the ARC Centre of Excellence for Nanoscale BioPhotonics (CNBP) at the University of Adelaide.

Her awards include the Prime Minister's Malcolm McIntosh Prize for Physical Scientist of the Year (2008), South Australian Scientist of the Year (2010), South Australia's Australian of the Year (2011), and the Eureka Prize for Excellence in Interdisciplinary Scientific Research (2015).

Read the full DST announcement¹⁶.

Academy welcomes focus on Great Barrier Reef climate impacts

February 19, 2019

The Australian Academy of Science has welcomed the findings of the Senate Committee Inquiry into the Great Barrier Reef 2050 Partnership program; particularly its recommendation that government address the impact of climate change on the reef and on Australia more broadly.

Academy President Professor John Shine AC said that it was pleasing to see a clear focus in the report on effectively tackling

climate change and linking public investments in the reef to the Australian and Queensland governments' Reef 2050 Plan.

"The key priorities for protecting and preserving the reef are to improve our understanding of the stressors and the best interventions through rigorous, peer-reviewed research, to improve water quality and to address climate change.

Professor Shine noted that Australia has a number of major institutions with established expertise in reef research and management, including CSIRO, the Australian Institute of Marine Studies, the Great Barrier Reef Marine Park Authority and a number of universities.

"The Academy has consistently called for a more strategic focus on improving the resilience of the Great Barrier Reef to climate change. The bottom line is that to preserve the reef for future generations, Australia will need to make significant additional investments over the coming years, whether through the Great Barrier Reef Foundation or through our other agencies.

"Without such efforts, the Reef 2050 Plan will fail to meet its objectives, and we'll lose all or part of one of our major natural treasures," Professor Shine said.

Fancy a glass? Explore the world of wine through chemistry

February 27, 2019

Have you ever wondered why your favourite wine tastes, smells and looks the colour it does? It's chemistry.

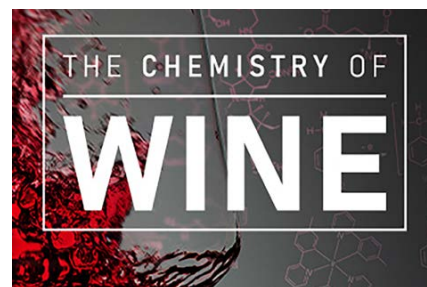
Join Yalumba chief winemaker, Louisa Rose, and Professor Kerry Wilkinson from the University of Adelaide, as they delve into the chemistry of wine. As you sip on award-winning Yalumba wines, Louisa and Kerry will take you on a chemistry journey to remember, exploring colour, aroma, style and faults. Canapés included.

Presented by the Australian Academy of Science and supported by Yalumba and University of Adelaide.

For more information and to book tickets, visit **the Academy website¹⁷**.



The Academy has consistently called for a more strategic focus on improving the resilience of the Great Barrier Reef to climate change.



¹⁶ <http://www.dst.defence.gov.au/media-centre/news>

¹⁷ <https://www.science.org.au/news-and-events/events/chemistry-wine>

Academy welcomes Australian Future Mines Centre commitment

February 13, 2019

The Australian Academy of Science has welcomed the Federal Opposition's commitment to establish an Australian Future Mines Centre to co-ordinate exploration work and lead the scientific research and development necessary to explore under deep cover, funded by a \$23 million Australian Research Council Special Research Initiative.

The Academy of Science is well positioned to provide input into this initiative as it meets many of the strategic goals laid out in the **UNCOVER Roadmap**¹⁸, a blueprint launched by the Academy and **AMIRA International**¹⁹ in August 2017 to unlock Australia's enormous potential mineral wealth.

The roadmap, supported by 53 organisations coordinated by AMIRA International, is based on the vision of the UNCOVER AUSTRALIA initiative, established by the Australian Academy of Science in 2012.

The UNCOVER AUSTRALIA initiative identifies what is required to transform Australia's ability to find non-bulk mineral resources such as copper and gold under the majority of Australia's landmass.

The Academy also welcomes Labor's commitment to build the future workforce needed to support Australia's high-tech mining and resource sector. It is encouraging to see a commitment to providing

\$2 million for 100 scholarships to address the decline in mining engineering enrolments, half of which will target women.

Academy Fellow and Chair of UNCOVER AUSTRALIA, Dr Phil McFadden welcomed the commitments by Labor.

"Australia needs new geoscience, technology and infrastructure to boost the rate of discoveries for base and precious metals and deliver Australia's major new mines of the future.

"Funding key elements of the UNCOVER roadmap will allow Australia to build on our scientific knowledge and develop new technologies that are necessary to increase the chances of finding economic deposits in the 70% of Australia that is covered by moderate or deep sediment.

"With the growth in renewable energy for example, we'll need more copper in the next 15 years than we've used in all of human history," Dr McFadden said.

Academy Fellow and UNCOVER Implementation Committee member, Professor Sue O'Reilly, said the evolution of the UNCOVER initiative is a template for how high-quality science can assist Australian industry.

"Since its inception, the UNCOVER AUSTRALIA initiative has seen strong cooperation across various sectors who have strategically focussed on understanding how we can use knowledge of how the planet works for successful mineral exploration in the covered areas of Australia," Professor O'Reilly said.

"This funding commitment puts Australia in a good position to re-establish itself as a world leader in minerals exploration and ensure strong economic growth for our future."



Watch the UNCOVER AUSTRALIA Curious video: <https://youtu.be/ULdggJOLVGc>

18 <https://www.uncoveraustralia.org.au/wp-content/uploads/2019/02/UNCOVER-Roadmap-Unlocking-Australias-Hidden-Potential.pdf>

19 <http://www.amira.com.au/WEB/site.asp?section=overview&page=whoware>



Nominations open for PM's Science Prizes

February 27, 2019

Do you know an inspiring scientist, innovator, or science, maths or technology teacher?

Nominate them for the 2019 Prime Minister's Prizes for Science.

The Prime Minister's Prizes for Science are Australia's most prestigious awards for outstanding achievements in scientific research, research-based innovation, and excellence in science teaching.

Prize recipients share \$750,000 in prize money, and have the opportunity to showcase important work undertaken in their field.

Prizes for research:

- Prime Minister's Prize for Science (\$250,000)
- Frank Fenner Prize for Life Scientist of the Year (\$50,000)
- Malcolm McIntosh Prize for Physical Scientist of the Year (\$50,000)

Prizes for innovation:

- Prime Minister's Prize for Innovation (\$250,000)
- Prize for New Innovators (\$50,000)

Prizes for science, mathematics or technology teaching:

- Prime Minister's Prize for Excellence in Science Teaching in Primary Schools (\$50,000)
- Prime Minister's Prize for Excellence in Science Teaching in Secondary Schools (\$50,000)

The Frank Fenner, Malcolm McIntosh and New Innovators prizes are awarded for early-career achievements made within 10 years (full time or full time equivalent) of completing relevant studies. The New Innovators prize rewards steps towards translating research into a commercially available product.

The work of researchers, innovators and teachers often shape Australian society and improve lives. You can show someone you value their contribution by nominating them for a prize.

Nominations are encouraged from all eligible scientists, innovators and teachers including from groups under-represented in these fields such as women and Indigenous Australians.

Find out more about the Prime Minister's Prizes for Science and how to nominate someone you know.²⁰



From left: Professor Melissa Little, Professor Min Gu and Professor John Church

Fellows receive international awards and NHMRC grant

January 14, 2019

Academy Fellow and UNSW Professor John Church is the first Australian awarded the BBVA Foundation Frontiers of Knowledge Award in Climate Change for his work in detecting, understanding and projecting sea-level rise due to climate change.

He shares the prize and €400,000 prize money with French space geodesist Anny Cazenave, a specialist in satellite altimetry (the measurement of the form and dimensions of Earth) and British climate scientist Professor Johnathan Gregory, an expert in ocean heat uptake and climate sensitivity.

The **prize**²¹ is rated as one of the world's 99 major science awards by IREG List of International Academic Awards, with a reputation score of 0.59 (a Nobel Prize has a score of 1.0). **Read more about the prize on the UNSW Newsroom website.**²²

Academy Fellow and RMIT Distinguished Professor Min Gu has been awarded a top international prize, the 2019 Dennis Gabor Award in Diffractive Optics, named in honour of the Nobel-winning inventor of holography, Dennis Gabor.

The award, announced by the International Society for Optics and Photonics (SPIE), is presented annually in recognition of

20 <https://www.industry.gov.au/funding-and-incentives/science-and-research/prime-ministers-prizes-for-science>

21 <https://www.frontiersofknowledgeawards-fbbva.es/noticias/the-bbva-foundation-recognizes-cazenave-church-and-gregory-for-their-achievements-in-detecting-understanding-and-projecting-sea-level-rise-due-to-climate-change/>

22 <https://newsroom.unsw.edu.au/news/science-tech/global-sea-level-expert-john-church-wins-leading-climate-change-award>

outstanding accomplishments in diffractive wave front technologies, especially those that further the development of holography and metrology applications.

Internationally renowned for his expertise in 3D optical imaging theory, Gu's discoveries are helping drive the development of solutions to some of our biggest challenges in renewable energy, information technology and big data storage.

Read more about the prize on the RMIT News website.²³

Meanwhile Academy Fellow and Murdoch Children's Research Institute Professor Melissa Little will receive \$936,221 from the National Health and Medical Research Council.

The funding will be used to further her research into the use of human stem cells to develop kidneys with functioning tissue as an alternative for renal replacement. The research will focus on the molecular basis of kidney development, renal disease and repair.

The funding was announced by the Minister for Health, Greg Hunt, in January. **Read the NHMRC media release.**²⁴

Join us to hear how science is changing lives

February 27, 2019

Join us at the Shine Dome for the 2019 Canberra Speaker Series, Changing Lives with Science.

Throughout this series we will hear remarkable science stories that haven't yet been told. Stories of innovation, research, breakthroughs and how science is solving the big challenges of our time.

The series kicked off with Eliza Ault-Connell and Associate Professor Kate Fox talking prosthetics and medical implants.

At the age of 16, **Eliza Ault-Connell** lost her fingers and legs after being diagnosed with meningococcal disease. Since then, her life has been changed by science in many ways—including prosthetics technology. Eliza is now a Paralympian, a mother of three, a marathon runner, and a director of Meningococcal Australia.

Eliza took us through her emotional and heartening story—from the moment her mum noticed the rash on her hand, to being inspired by the 1996 Paralympics runners, to the advances in prosthetic technology that have improved her quality of life.

We also heard from **Associate Professor Kate Fox** from RMIT University about her remarkable work in 3D printing for medical applications. Kate explained her passion for patient-specific treatments arose from her own health issues, and those of her son, who has multiple disabilities and uses a walker. She explained the potential and challenges of 3D printing for medical applications, and shared some moving success stories, such



as a little girl whose 3D-printed exoskeleton allowed her to play using her hands for the first time.

Don't miss the next event on Tuesday 16 April where we'll be talking 'electronic skin' with Associate Professor Madhu Bhaskaran from RMIT University and Sleptite CEO Cameron van den Dungen.

More information about the 'Changing lives with science' speaker series²⁵

Academy welcomes pragmatic approach to Defence Trade Controls

February 14, 2019

The Australian Academy of Science has welcomed the findings of an independent review of the Defence Trade Controls Act.

Academy President Professor John Shine AC said that the review by Dr Vivienne Thom AM confirmed the original intent of the Bill to balance Australia's international trade and security obligations with the need for our researcher workforce to engage collaboratively with partners around the world.

"The Academy of Science was very concerned at proposals put forward by defence officials in 2015 to introduce sweeping new

²³ <https://www.rmit.edu.au/news/all-news/2019/jan/optics-award-pioneering-physicist>

²⁴ <https://nhmrc.gov.au/about-us/news-centre/support-research-develop-kidneys-stem-cells>

²⁵ <https://www.science.org.au/news-and-events/events/public-speaker-series/changing-lives-science>



Australia's international trade and security obligations should be balanced with the need for our researcher workforce to engage collaboratively with partners around the world.

powers to restrict the international exchange of knowledge and ideas," said Professor Shine.

"Further restrictions would effectively have limited Australian researchers' ability to engage in international research collaboration and to benefit as a nation from the many international research collaborations and expertise on which a substantial proportion of our economy relies.

"We're very pleased that these concerns have been heard and believe that the recommendations in the review strike the right balance in Australia's national interests.

"We trust that the Australian Government will heed the recommendations of the review to continue strengthening and streamlining the administration of this legislation.

Background

The Defence Trade Controls Act was introduced in 2012 to regulate the international supply or exchange of certain technologies with potential military applications.

The Act was amended in 2015 following an extensive consultation process led by then Chief Scientist

Professor Ian Chubb AC FAA FTSE, with a provision for a review of operation after two years.

National conversation of science and research priorities is important and timely

February 20, 2019

The Australian Academy of Science has welcomed the announcement by the Minister for Education, Dan Tehan, of a review of Australia's science and research priorities.

Academy President Professor John Shine said that the current science and research priorities and the associated practical challenges have been useful in informing research directions.

"Our **existing nine priorities**²⁶ were developed by former Chief Scientist and Academy Fellow Professor Ian Chubb through an extensive process of consultation," said Professor Shine.

"At the time of their announcement in May 2015 there was an intention that they would drive increased research investments in areas of immediate and critical importance to Australia, and that they would be reviewed every two years.

"A great deal has happened in the Australian research policy landscape since 2015 and it is both important and timely that we have a new national conversation about our priorities going forward."

The review panel announced by the Minister will be chaired by Australian Research Council Chief Executive Professor Sue Thomas and will include experienced Vice Chancellors and senior executives from Australia's research and innovation sector.

Also included on the panel are Australia's Chief Scientist Dr Alan Finkel and National Health and Medical Research Council CEO Professor Anne Kelso AO, both Fellows of the Australian Academy of Science.

Academy welcomes priority investment in critical minerals projects

February 13, 2019

The Australian Academy of Science has welcomed the Australian Government's measure to prioritise funding for critical minerals projects in the next round of the Cooperative Research Centres Project (CRC-P) Grants to help grow the resource sector.

The CRC-P program was identified as a useful mechanism to undertake the research and technology development needed to support the exploration of critical minerals in the **UNCOVER Roadmap**²⁷.

26 https://www.industry.gov.au/sites/g/files/net3906/f/2018-10/science_and_research_priorities_2015.pdf

27 <https://www.uncoveraustralia.org.au/wp-content/uploads/2019/02/UNCOVER-Roadmap-Unlocking-Australias-Hidden-Potential.pdf>

The UNCOVER Roadmap is a blueprint launched by the Academy and AMIRA International in August 2017 to unlock Australia's enormous potential mineral wealth.

The Roadmap, supported by 53 organisations coordinated by AMIRA International, is based on the vision of the UNCOVER AUSTRALIA initiative, established by the Australian Academy of Science in 2012.

The UNCOVER AUSTRALIA initiative identifies what is required to transform Australia's ability to find non-bulk mineral resources such as copper and gold under the majority of Australia's landmass.

Academy Council Member Professor Sue O'Reilly AM said that Australia is thought to be rich in renewable energy minerals such as copper, cobalt and rare earth metals, but that these can't be easily found using conventional exploration approaches.

"Demand for cobalt just from the electric vehicle industry is expected to exceed global supply within just a few years," said Professor O'Reilly.

"Investments in research and development that will help find these metals will be enormously beneficial to Australia with the potential to create jobs, reduce emissions and revitalise regional communities."

Academy President Professor Shine AC congratulated the Minister for Industry, Science and Technology the Hon Karen Andrews and the Minister for Resources and Northern Australia the Hon Matthew Canavan for prioritising investment in this area.



Feral horse dung piles near a snowpatch herbfield at the top of the Snowy River. Image: Casey Gibson

Scientists call on NSW Premier to inspect feral horse damage in Kosciuszko

January 15, 2019

Australian scientists are calling on NSW Premier Gladys Berejiklian to visit Kosciuszko National Park to see firsthand the damage inflicted by feral horses on the natural environment.

Australian Academy of Science Secretary for Science Policy, Professor David Day, said leading research on the impacts of feral horses locally provides clear scientific evidence of environmental damage done by this invasive species.

"Feral horses are impacting Kosciuszko's endangered alpine animals, its wetlands and streams and the headwater catchments of the Murray, Murrumbidgee and Snowy rivers. The Premier needs to see this for herself and take decisive action to halt the damage," Professor Day said.

Professor Jamie Pittock of the ANU's Fenner School of Environment and Society said the NSW Government has failed to acknowledge the overwhelming scientific evidence of Australia's leading alpine researchers and scientists.

"The evidence presented at the Kosciuszko Science Conference in November last year was unequivocal," Professor Pittock said.

"Even small numbers of feral horses cause damage to the park and the only realistic way to bring the thousands of feral horses under control is to use a mix of methods, including aerial culling, particularly for the Kosciuszko summit alpine area and rugged and remote parts of the park.

"The impacts of these feral horses are mounting, and the cost of getting on top of the problem and then restoring the landscapes is rising.

"There is no established heritage benefit of having feral horses in the national park, but already, millions of dollars will be needed to restore the damage these horses

have done to the catchments, and that amount increases the longer they are left unchecked.

“It is now critical for the Premier to visit Kosciuszko National Park this summer to see for herself the damage caused by feral horses and to instigate action that will stop the damage and restore these iconic landscapes,” said Professor Pittock.

Professor Pittock said the government’s credibility as a defender of NSW’s natural environments and catchments at Kosciuszko and its respect for scientific evidence was seriously under question.

“In 1944, another NSW Premier, Sir William McKell observed for himself the impacts of years of stock grazing to the catchments of Kosciuszko and in his words was so ‘outraged’ with the severity of the erosion that he immediately took action to establish protection through the creation of Kosciuszko State Park,” Professor Pittock said.

“For the past 75 years, Liberal Governments have had a proud history of protecting the Kosciuszko National Park. There

is still an opportunity for the Premier to maintain that proud tradition,” Professor Pittock said.

Read the Kosciuszko Science Accord²⁸

Shine Dome to open doors for Heritage Festival

February 27, 2019

The iconic heritage-listed Shine Dome will be **open to the public on Sunday 5 May²⁹** as part of the Canberra and Region Heritage Festival, and to celebrate its 60th Anniversary.

Make the most of this rare chance to explore the Shine Dome. Staff from the Australian Academy of Science will be conducting tours and sharing fascinating secrets from the construction of this unique building to the present day.

You can also join us in the Ian Wark Theatre to celebrate the 50th Anniversary of the Moon Landing with **a screening of Hidden Figures³⁰**. This Oscar-nominated film tells the incredible story of three brilliant and inspiring African-American women working

at NASA who served as the brains behind the launch into orbit of astronaut John Glenn.

The screening will be opened by Australia’s Astronomer-at-Large, Professor Fred Watson. Before the main feature, we will screen *The 50th*, a documentary by local filmmaker Scott Holgate, that highlights the role two Canberrans (John Saxon and Mike Dunn) played in the Moon Landing in 1969.

Book now to secure your tour of the Shine Dome³¹

Reserve your seats to the film screening here³²

Chemistry celebrated across the globe in 2019

February 27, 2019

2019 is the International Year of the Periodic Table, with events to mark the 150th anniversary of Mendeleev’s discovery of the periodic system and celebrate the importance of the chemical elements across science and in modern society.

The year of celebration was launched at the UNESCO headquarters in Paris in late January, with the Academy represented at the event by immediate past president Professor Andrew Holmes and Professor Bruce McKellar.

The day’s celebrations included presentations by Nobel laureates, panel discussions and musical performances. A very successful dinner for dignitaries was also



28 <https://www.science.org.au/news-and-events/events/feral-horse-impacts-kosciuszko-science-conference>

29 <https://www.science.org.au/news-and-events/events/tours-shine-dome>

30 <https://www.science.org.au/news-and-events/events/hidden-figures-shine-dome>

31 <https://www.science.org.au/news-and-events/events/tours-shine-dome>

32 <https://www.science.org.au/news-and-events/events/hidden-figures-shine-dome>



Watch the History of the Periodic Table Curious video: <https://youtu.be/HFSLdENOPhg>

hosted by Professor Holmes and attended by the Australian Ambassador to France, His Excellency Mr Brendan Berne.

The Academy has several exciting chemistry-related events planned for this year, including the **Chemistry of Wine**³³ in Adelaide on 10 April, **After Dark at Queensland Museum**³⁴ at the World Science Festival in Brisbane on 22 March, and further events yet to be announced.

More information on these activities will be posted on the **Academy's website**³⁵ as it becomes available, or **follow the Academy on Facebook**³⁶.

Leading scientists to tour Australia

February 27, 2019

Geoffrey Frew Fellow Professor Donna Strickland, optical physics

Nobel prize-winner Professor Donna Strickland has been awarded the Academy's 2019 Geoffrey Frew Fellowship and will visit Australia in

2020. Professor Strickland received the Nobel Prize in Physics in 2018 along with Dr Gérard Mourou for co-inventing Chirped Pulse Amplification. Their invention paved the way for the development of more intense laser pulses that have numerous applications in medicine and industry.

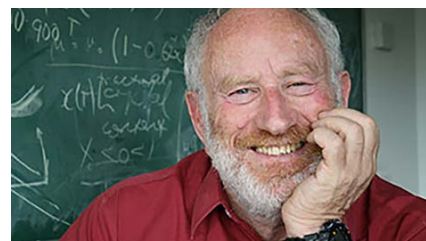
Professor Strickland is based at the University of Waterloo, Canada where she leads a research group developing high-intensity laser systems for nonlinear optics investigations.

Professor Strickland will present the 2019 Geoffrey Frew Fellowship lecture at the 14th Pacific Rim Conference on Lasers and Electro-Optics in Sydney in 2020. She will also visit institutes and present lectures across Australia. Dates and details will be published on the Academy website once confirmed.

The Geoffrey Frew Fellowship brings distinguished overseas scientists to Australia to participate in Australian spectroscopy conferences and to visit scientific



Professor Donna Strickland



Professor Herbert Huppert

centres. The Australian Optical Society has generously matched the Academy's funding support to this Fellowship since 2015.

More information about the Geoffrey Frew Fellowship³⁷

Selby Fellow Professor Herbert Huppert, geophysicist

Recipient of the Academy's 2019 Selby Fellowship, Professor Herbert Huppert FRS, will visit Australia to present lectures across the nation. Australian-born Professor Huppert is Emeritus Professor of Theoretical Geophysics at Cambridge University, a Fellow of the Royal Society and the Foundation Director of the Institute of Theoretical Geophysics.

He has published extensively across a wide range of disciplines including geology, geophysics, mathematics, crystal growth, fluid mechanics, oceanography and meteorology. In particular, his research focuses on carbon

33 <https://www.science.org.au/news-and-events/events/chemistry-wine>

34 <http://www.worldsciencefestival.com.au/program/events/after-dark-at-queensland-museum/>

35 <https://www.science.org.au/>

36 <https://www.facebook.com/AustralianAcademyofScience>

37 <https://www.science.org.au/opportunities/travel/travelling-fellowships/geoffrey-frew-fellowship>

dioxide sequestration and applying fluid-mechanical principles to the Earth sciences.

Professor Huppert will present lectures in Perth, Adelaide, Sydney, Melbourne, Brisbane, Darwin and Alice Springs, with lecture tour dates and details to be published on the Academy website once confirmed.

Selby Fellowships are awarded to distinguished overseas scientists to visit scientific centres in Australia. Fellows are outstanding lecturers and are expected to increase public awareness of science. The Fellowship is financed through the generosity of the trustees of the Selby Scientific Foundation.

More information about the Selby Fellowship³⁸

Academy-funded conference brings diverse researchers together

February 27, 2019

Each year, the Academy funds a research conference thanks to the generous support of the late Lady Elizabeth White MBBS and the late Sir Frederick White FAA FRS.

The 2018 Elizabeth and Frederick White Conference encompassed diverse topics from astrophysics to volcanoes—unified by the theme ‘Frontiers in gas-solid processes from the atomic scale to the parsec’.

Nearly 50 people from Australia, USA, Belgium and Japan attended the conference. The conference comprised 35 oral and poster presentations, laboratory tours and a public lecture delivered by Professor Klaus Lackner, a pioneer in direct capture of carbon dioxide.

The interdisciplinary nature of the conference proved highly beneficial, with many participants planning to embark on new research directions as a result of the meeting.

The conference was held 5–7 September 2018 at the Australian National University’s Crawford School.

This year’s Elizabeth and Frederick White Conference ‘Linking galaxies: From the epoch of initial star-formation to today’ was held in Sydney, 18–22 February 2019.

More information about the Elizabeth and Frederick White conferences³⁹



Associate Professor Dale Nimmo

Research reveals how to grow wildlife-friendly cities

February 27, 2019

Associate Professor Dale Nimmo

As urban areas expand, habitat for plants and animals dwindles. Is there a better way to design urban areas to maximise wildlife?

Associate Professor Dale Nimmo from Charles Sturt University in NSW is investigating how to distribute people for maximum biodiversity, with support from the Academy’s WH Gladstones Population and Environment Fund.

Since 2017, Dr Nimmo has undertaken 180 bird surveys across 30 landscapes in both Albury and Canberra, and pollinator surveys in Albury. Funding allowed Dr Nimmo to employ two research assistants to help him carry out these surveys.



The 2018 Elizabeth and Frederick White Conference encompassed diverse topics—from astrophysics to volcanoes.



The superb fairy wren was one of the many species identified in the bird surveys.

38 <https://www.science.org.au/opportunities/travel/travelling-fellowships/selby-fellowship>

39 <https://www.science.org.au/opportunities-scientists/conference-lecture-funding/elizabeth-and-frederick-white>

In 2018, he published a **paper in the Journal of Applied Ecology**⁴⁰ revealing the importance of large continuous tracts of vegetation for bird conservation. Future work aims to reveal the impact of city size.

Dr Nimmo also focused on communicating his work to the public over the two-year funding period, completing interviews with local media, regional newspapers and the ABC, in addition to **widespread media coverage of his paper**⁴¹.

The WH Gladstone Population and Environment Fund awards a grant for empirical research into the effect of Australia's population on the environment. The fund was established in 2010 through generous donations from the late Dr William H Gladstones.

More information about the WH Gladstones Population and Environment Fund⁴²



Dr Christina Kellogg presents at UNSW as part of her Rudi Lemberg Travelling Fellowship tour of Australia. Photo by Tracy Ainsworth.

Fellowship makes Great Barrier Reef dream a reality February 27, 2019

As a coral reef researcher, it had long been on Dr Christina Kellogg's bucket list to see the Great Barrier

Reef. As the recipient of the 2018 Rudi Lemberg Travelling Fellowship, she was able to make that visit a reality as part of her seminar tour of Australia's east coast.

Dr Kellogg is a research microbiologist with the United States Geological Survey (USGS) and an international leader in coral microbial ecology. She has been working in deep-sea coral ecosystems since 2004 and has visited them personally in submersibles.

Dr Kellogg visited five universities in October 2018. In addition, she gave a presentation to the Queensland Government, met with a representative of the Great Barrier Reef Foundation, and was interviewed to create video content for World of Drones, a STEAM education resource.

Dr Kellogg is pursuing collaborative projects with several researchers she met as a result of the 2018 Rudi Lemberg Travelling Fellowship.

More information about the Rudi Lemberg Travelling Fellowship⁴³

Opportunities for scientists—February 2019 February 27, 2019

External opportunities

L'Oréal-UNESCO For Women in Science Australia and New Zealand Fellowships

Applications close 4 March 2019

Recognises the achievements of outstanding female scientists, supporting them to continue their research and help them rise to leadership positions in their field of expertise. Four Australian Fellowships and one New Zealand Fellowship—\$25,000 each

More information on L'Oréal-UNESCO For Women in Science Australia & New Zealand Fellowships⁴⁴

Keio Medical Science Prize Applications close 7 March 2019

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

More information on the Keio Medical Science Prize⁴⁵

Prime Minister's Prizes for Science Nominations close 12 March 2019

Nominations sought for Australia's national science and teaching awards, which carry a total pool of \$750,000 in prize monies. Categories are:

- Prime Minister's Prize for Science—\$250,000
- Frank Fenner Prize for Life Scientist of the Year—\$50,000
- Malcolm McIntosh Prize for Physical Scientist of the Year—\$50,000
- Prime Minister's Prize for Innovation—\$250,000

40 <https://besjournals.onlinelibrary.wiley.com/doi/10.1111/1365-2664.13183>

41 <https://www.theguardian.com/environment/2018/may/31/chronic-inaction-call-for-planning-overhaul-as-population-growth-threatens-biodiversity>

42 <https://www.science.org.au/opportunities/research-funding/wh-gladstones-population-and-environment-fund>

43 <https://www.science.org.au/opportunities/travel/travelling-fellowships/rudi-lemberg-travelling-fellowship>

44 <https://www.forwomeninscience.com.au/>

45 <http://www.ms-fund.keio.ac.jp/prize/>

- Prize for New Innovators—\$50,000
- Prime Minister's Prize for Excellence in Science Teaching in Primary Schools—\$50,000
- Prime Minister's Prize for Excellence in Science Teaching in Secondary Schools—\$50,000

More information on the Prime Minister's Prizes for Science⁴⁶

See more external awards and prizes⁴⁷

fellows update— February 2019

February 27, 2019

Honours and awards to Fellows

Dr Liz Dennis FAA—Companion in the General Division of the Order of Australia (AC) for eminent service as a researcher and academic in the area of genomics and plant development, and to professional organisations

Professor Ron Ekers FAA—Officer of the Order of Australia (AO) for distinguished service to science as a radio astronomer, to scientific education, and to international astronomical organisations

Professor Bruce Kemp

FAA—Officer of the Order of Australia (AO) for distinguished service to biomedical research, particularly to the study of protein phosphorylation

Emeritus Professor Brian

Kennett FAA—Officer of the Order of Australia (AO) for distinguished service to the earth

sciences as a leading academic and researcher, particularly in the field of seismology

Professor Elaine Sadler FAA—Officer of the Order of Australia (AO) for distinguished service to science as an astrophysicist, in the field of galaxy evolution, and to gender equality

Professor John Church

FAA FTSE—BBVA Foundation Frontiers of Knowledge Award in Climate Change

Obituaries

*Professor Michael Dopita AM FAA
28 October 1946 to 22
December 2018*

Professor Michael Dopita was elected to the Academy in 1996 in recognition of his fundamental contributions to research in astrophysics—from star formation to active galactic nuclei and radio jets. He was internationally recognised as a leading authority in interstellar astrophysics, with an extraordinarily broad range of achievements.

Since 1975, Professor Dopita worked at the Research School of Astronomy and Astrophysics (previously Mount Stromlo Observatory) at the Australian National University, where he was a Professor of Astronomy. Professor Dopita was involved in several instrumental projects, including the construction of the Wide Field Spectrograph, the FUSE and the Endeavour UV Space Telescopes. Professor Dopita provided policy advice to NASA through his work on the Science Oversight Committee



Professor Michael Dopita AM FAA

for the Hubble Space Telescope Wide Field Camera 3. He also served on ARENA, the policy advice committee for the conduct of astronomy at Dome C in Antarctica.

Professor Dopita was an inaugural Australian Federation Fellow (2002–2006), ISI Citation Laureate (2001) and Centenary Medalist (2003). He was awarded the Academy's Pawsey Medal in 1983 and became a Member of the Order of Australia (AM) in 2013. He served as council member on various astronomical unions and on the editorial board of several academic journals.

Since his election to the Academy, Professor Dopita generously contributed his time and expertise to Academy projects. He was a member of the Academy's Council (2004–13) and served as Treasurer from 2008 to 2013. He also served on a number of Academy and National committees.

⁴⁶ <https://www.industry.gov.au/funding-and-incentives/science-and-research/prime-ministers-prizes-for-science>

⁴⁷ <https://www.science.org.au/opportunities/recognition/external-sources-recognition>