



Professor John Shine AC PresAA

Message from the President

July 29, 2019

Since the inception of the Academy 65 years ago, gifts and legacies from Fellows and friends have helped us retain our independence and allowed us to foster, celebrate and promote scientific excellence in Australia.

In this newsletter, we recognise those who have contributed to our mission. We also showcase some of the fantastic and diverse work they have supported: from awards, to international activities, to a new national network and engaging outreach content. None of this would be possible without the generous support of our donors.

This newsletter also highlights the publication of the 2019 volume of the Academy's journal, Historical

Records of Australian Science. This volume includes original scholarly work in addition to biographical memoirs of late Academy Fellows.

Further reading can be found in a curated selection of recent content from the Academy's science communication project, Curious. This project, with a focus on social media outreach, continues to grow and engage, with the Academy's Facebook audience now surpassing 1.5 million people.

Enjoy the July newsletter.

Professor John Shine AC PresAA

Action needed to better understand Australian diets

July 29, 2019

Nutrition science offers huge untapped potential to boost the health and wealth of the nation. But what does the typical Australian diet look like? How can it be improved—from paddock to plate—to target health and wellbeing for all Australians, at all ages? And how can consumers make sense of the blizzard of unreliable and conflicting nutrition advice?

These and other major questions are addressed in **Nourishing**

Australia: a decadal plan for the science of nutrition¹, developed by the Australian Academy of Science.

The 10-year plan, launched today at Parliament House by the Minister for Agriculture, Senator Bridget McKenzie, outlines four essential areas where the science of nutrition will contribute to enhancing the health of Australians:

1. social factors that determine dietary choices
2. nutrition mechanisms underpinning healthy and productive lives
3. precision and personalised nutrition that account for differences between people
4. education and research training to ensure that Australians are empowered to make knowledgeable dietary choices.

The plan outlines how these four pillars will generate a greater understanding of why individuals make dietary choices and how we can develop and incorporate new knowledge of nutritional genomics and individualised nutrition therapies. It recognises that Australians are hungry for information about nutrition, foods and dietary patterns and the effects they have on the body.

¹ <http://www.science.org.au/nourishing-australia>



Professor Mike Gidley, Senator Bridget McKenzie, Professor Stephen Simpson and Professor Therese Jefferson.

Chair of the Academy's National Committee for Nutrition, Professor Mike Gidley from the University of Queensland, said Australia does not currently have large-scale longitudinal data on food intake, nutrition status and relationships with societal determinants and health outcomes for its population.

"National nutrition surveys are infrequent and irregular, resulting in a lack of current information on the relationship between food intake and health outcomes for Australians," Professor Gidley said.

"There is an urgent need to utilise new tools and digital technologies to assess the national diet on a population-wide scale," Professor Gidley said.

"Bringing nutrition data together from a range of new data sources, such as citizen science, national surveys, prospective cohort studies, clinical trials and more, has the potential to provide much richer datasets and will give us a clearer picture of how diet relates to health outcomes over time.

"Indeed, without a strengthened contribution from the social, economic and environmental disciplines to the science of nutrition, traditional approaches will not deliver their potential benefits in translating all this new knowledge into improvements in our health."

Co-chair of the plan's Expert Working Group, Professor Stephen Simpson from the University of Sydney, said Australia enjoys a global reputation for its nutrition science, one of many disciplines where we punch above our weight.

"In combination with established strengths in our agrifood industry, medical technology, social sciences and higher education sectors, Australia is entering an era of opportunity to be a regional and global leader in broadening the science of nutrition and linking it to health, social, and economic outcomes for the benefit of all Australians," said Professor Simpson, who is also a Fellow of the Australian Academy of Science.

"Nourishing Australia outlines steps that need to be taken over the next ten years to secure our future."

The Academy acknowledges the financial support from the Australian Research Council's **Linkage Learned Academies Special Projects fund**² to develop this plan. The plan is aspirational and further consultation is needed prior to implementation.

Academies call on health ministers to resolve health data issues

July 15, 2019

Regulatory barriers that limit timely access to population and health data must be resolved to achieve better health outcomes for Australians, according to leading scientists and medical health researchers.

The Australian Academy of Science and the Australian Academy of Health and Medical Sciences are calling for the COAG Health Council to address health data availability and linkage as a priority at its next meeting later this year.

The call follows a roundtable convened by the two academies that brought together some of Australia's leading health and medical researchers, clinicians and other experts to identify areas for improvement.

President of the Australian Academy of Health and Medical Sciences, Professor Ian Frazer, said that there is a real opportunity to harness the power of data to drive improvements in health

² <https://www.arc.gov.au/grants/linkage-program/linkage-learned-academies-special-project>

outcomes—by creating an environment in which the safe and secure use of patient data is balanced with the rights and interests of individuals.

“The intelligent use of health data gathered from the community is a critical part of moving towards better and more cost-effective health systems. Research studies using aggregated data revealed, for instance, the link between smoking and lung cancer, and the unfortunate consequences of iodine deficiency in infants.

“There are some valuable initiatives in Australia that are improving data access and linkage for legitimate research purposes, but more needs to be done to make data available and hence broaden the impact of such efforts.

“There remains a plethora of complex jurisdictional, legal and ethical regulations that limit the ability of researchers and clinicians to effectively access and use aggregated health data to improve care. Access to health data for research can lead to interventions that have real and immediate impact on community health, and can also potentially avert unwanted rare but significant health problems associated with drugs and implanted devices” said Professor Frazer, who is also a Fellow of the Australian Academy of Science.

A 2018 ‘Flying Blind’ report by the Digital Health Cooperative Research Centre and CMCRC³ cites a NHMRC-funded study which took three years to gain Commonwealth

approval. In the study cancer notifications were linked with de-identified Medicare Benefits Schedule (MBS) data. Researchers found an increased cancer risk for some individuals exposed to CT scans. The case study is explained further below.

The Australian Academy of Science’s Professor Michael Barber said recent advances in health and medical technologies and research methods means there is a significant opportunity for Australia to realise innovation and improvement in preventative health, medicine and healthcare.

“Australia, led by action from federal and state and territory health ministers, needs to build on existing efforts to enable efficient, rigorous, safe and secure use of data for research, while protecting the rights and interests of individuals,” Professor Barber said.

The academies are calling for renewed and expanded action in the following areas:

- **Resolve regulatory barriers limiting timely access to existing population and health data collected at state and national levels.** In this context, Australia can learn from jurisdictions such as Scotland, Canada and New Zealand. In addition, better access to private sector held data will help resolve inefficiencies.
- **Enhance medical and community understanding of, and protocols for safe and**

ethical collection, storage, synthesis and analysis of health data.

- **At Commonwealth level build upon successful state-based linkage programs** such as the Public Health Research Network.
- **Develop new approaches to accessing and utilising data from novel sources,** including the Internet of Things, social media and wearables.
- **Ensure continued engagement with and respect for Indigenous data sovereignty.**
- **Further improve the quality and reliability of health and medical data collections.**
- **Bolster efforts to generate a data-skilled clinical and research workforce** through expanded professional and post-graduate training programs.

Read the **communiqué: Improving accessibility and linkage of data to achieve better health outcomes for all Australians**⁴

Background information—Flying Blind Case Study

In 2008, researchers at the University of Melbourne received funding from the National Health and Medical Research Council (NHMRC) to investigate whether CT scans increased the risk of cancer by linking cancer notifications (held by the states and territories) with de-identified Medicare Benefits Schedule (MBS) data. However, the study was seriously delayed:

³ <https://flyingblind.cmcrc.com/researchers-health-data>

⁴ <https://www.science.org.au/supporting-science/science-policy-and-analysis/position-statements/improving-accessibility-linkage-data-better-health-outcomes>

Commonwealth approval took three years to gain. After linking the necessary data, the researchers found that cancer risk was increased by an average of 24% for individuals exposed to CT scans before the age of 20; for those exposed at 'very young ages', the risk was 200% higher. The results were published in the British Medical Journal in 2013 (39) and led to the development of educational materials a year later aimed at making both radiologists and the public aware of the risks. The delays encountered by the researchers may well have led to a number of unnecessary exposures to CT radiation, and, in the longer run, unnecessary cancers. **Source**⁵

A philanthropy update from the Academy

July 29, 2019

Supporters' breakfast

During Science at the Shine Dome 2019, award donors and their family members had the special

opportunity to meet the 2019 recipients of the awards they support at a breakfast event.

The topic of conversation for guests Tui Nolan, Dr Beth Heyde and Professor Geordie Williamson FAA FRS was everything mathematics. Dr Heyde's late husband, mathematician Professor Christopher Heyde AM FAA, is remembered through the **Christopher Heyde Medal**⁶. This medal recognises distinguished research in the mathematical sciences and was **awarded to Professor Williamson this year**⁷.

Mr Nolan was also a 2019 award-winner, as one of the three inaugural recipients of the **Aboriginal and Torres Strait Islander Scientist Travelling Research Awards**⁸, along with Amy Searle and Bradley Moggridge.

The award was established by an anonymous donor wanting to provide opportunities for young Aboriginal and Torres Strait Islander

scientists to travel and network with other early- to mid-career researchers and Academy Fellows.

Recipients of the third round of the **Max Day Environmental Science Fellowship Award**⁹, Dr Tim Doherty and Nicole Foster, were also in attendance. The award was established in 2017 with a donation from Dr Maxwell Frank Cooper Day AO FAA, and Dr Day himself presented the inaugural winners at age 101. The family, represented by Jon Day, and other donors continue this proud legacy today and follow the research of the awardees with keen interest.

Hastings Pawsey, the son of Dr JL Pawsey FAA for whom the **Pawsey Medal**¹⁰ is named, also attended the breakfast. The medal recognises outstanding research in physics and was awarded to **Professor Steven Flammia**¹¹ this year.

The Academy was delighted to welcome Dr Sarah Gani, the daughter of Ruth Stephens Gani.



L-R: Tui Nolan, Dr Beth Heyde and Professor Geordie Williamson FAA FRS.



L-R: ATSI award recipients Amy Searle, Tui Nolan and Bradley Moggridge with Professor Peter Radoll, Dean of Aboriginal and Torres Strait Islander Leadership and Strategy, University of Canberra.

5 <https://flyingblind.cmrc.com/researchers-health-data>

6 <https://www.science.org.au/opportunities-scientists/recognition/honoric-awards/early-career-awards/christopher-heyde-medal>

7 <https://www.science.org.au/opportunities-scientists/recognition/honoric-awards/honoric-awardees/2019-awardees#heyde>

8 <https://www.science.org.au/opportunities/travel/travelling-fellowships/aboriginal-torres-strait-islander-scientist-travelling-research-award>

9 <https://www.science.org.au/opportunities/research-funding/max-day-environmental-science-fellowship-award>

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

11 <https://www.science.org.au/opportunities-scientists/recognition/honoric-awards/honoric-awardees/2019-awardees#pawsey>



L–R: Dr Tim Doherty, Nicole Foster and Jon Day.



L–R: Professor Nanda Dasgupta FAA, former Pawsey Medal winner, with Hastings Pawsey and his wife Elizabeth Pawsey.

Dr Gani had the opportunity to meet **Dr Justin Wong**¹², the 2019 recipient of the medal that honours her mother’s contributions to human cytogenetics.

Other guests included Mrs Pamela McDougall and Mrs Denise Hales, representing the donor and namesake of the **Anton Hales Medal**¹³ respectively. This medal was established with a donation from the late Professor Ian McDougall and honours the contributions to earth sciences by the late Professor Anton L Hales FAA.

The Academy thanks the many donors, partners and family members who fund and support our awards.

Bequests

The Academy has been notified of a generous legacy gift from Dr Margaret Middleton who passed away earlier this year at the age of 90. Dr Middleton’s bequest will ensure that the award, named in her honour, will continue to provide valuable research funding for endangered Australian native

vertebrate animals well into the future.

“Margaret was a dedicated supporter of science at the Academy and a shrewd investor in its outcomes. We shall miss her wise counsel and remember her great generosity with gratitude”. Professor Andrew Holmes, immediate past President of the Australian Academy of Science.

More about Dr Margaret Middleton¹⁴

Donor honour roll

The Academy would like to thank those donors who have supported our Annual Giving Program in 2019. Your commitment and support really do make a world of difference.

More about philanthropic giving¹⁵

STEM Women launches on 1 August

July 29, 2019

On 1 August the Australian Academy of Science will launch a new resource for gender equity toolkits: STEM Women, an online



directory of women in Australia working in STEM.

STEM Women aims to promote gender equity by showcasing the breadth of STEM talent in Australia. It was developed by the Academy in partnership with CSIRO, Science & Technology Australia, and the Australian Science Media Centre, with financial support from the Australian Government.

STEM Women connects a diverse range of women with exciting opportunities to progress their careers and personal capabilities such as conference invitations, committee and board requests, and award nominations.

12 <https://www.science.org.au/opportunities-scientists/recognition/honorific-awards/honorific-awardees/2019-awardees#gani>

13 <https://www.science.org.au/opportunities-scientists/recognition/honorific-awards/early-career-awards/anton-hales-medal>

14 <https://www.science.org.au/about-us/support-us/donor-stories/vale-dr-margaret-middleton-pillar-science-and-academy>

15 <https://www.science.org.au/about-us/support-us/philanthropic-giving>

STEM Women is a resource built for both experts and seekers.

Expert profile creation is quick through social media login and a streamlined sign-up process. Integration with CSIRO|Data61 Expert Connect allows an expert's research and media activity to be updated in real time, removing the burden to continuously update individual profiles.

Seekers can search for experts based on their expertise, location, interest in opportunities and other diversity attributes. Experts can be shortlisted throughout the search process and messaged directly through STEM Women.

STEM Women is a platform developed to increase the representation of all women at all stages of their STEM career, whether in academia or industry. For details on how to share STEM Women through your organisation contact hello@stemwomen.org.au

Contributing partners



ARC Linkage grants awarded to Fellows

July 05, 2019

Five Fellows of the Australian Academy of Science are among the recipients of the Australian Research Council's Linkage Projects scheme, announced today by the Hon. Dan Tehan MP, Minister for Education.

The Linkage Projects scheme supports university researchers to find practical solutions to problems and challenges in real-world, industry-based settings.

The funding for research partnerships includes:

- \$484,189 for Queensland University of Technology to lead a project to revolutionise water-quality monitoring in the information age with automated low-cost sensors and novel statistical methods. The research will be led by **Professor Kerrie Mengersen FAA** and collaborators.
- \$442,000 for the Australian National University to research more comprehensive 3D models of the seismic structure of Southwest Australia to enhance assessment of seismic activity and improve understanding of the mineral resource potential. The research will be led by Associate Professor Meghan Miller, **Professor Brian Kennett AO FAA FRS** and colleagues.
- \$664,511 for UNSW Sydney to improve productivity in emergency services personnel by evaluating a program that reduces stress reactions and increases cognitive functioning in high-stress work environments. The research will be led by **Professor Richard Bryant AC FAA** and Associate Professor Samuel Harvey.
- \$206,100 for Deakin University to research next-generation solid-state batteries to drive an automotive revolution. The project seeks to generate new knowledge in battery materials and design. The research will be led by Associate Professor Patrick Howlett, **Professor Maria Forsyth FAA** and colleagues.
- \$612,074 for the University of Melbourne to research high-fidelity, long lasting, single-neuron brain machine interfaces—knowledge that is critically important to the development of technologies that interface electronics with the human body. The research will be led by **Professor Steven Praver FAA** and colleagues.



Five Academy Fellows have been awarded funding in the latest round of ARC Linkage grants.

More information about the grants¹⁶ and awardees from previous rounds of funding who are Fellows of the Academy¹⁷

¹⁶ <https://rms.arc.gov.au/RMS/Report/Download/Report/a3f6be6e-33f7-4fb5-98a6-7526aaa184cf/199>

¹⁷ <https://www.science.org.au/news-and-events/news-and-media-releases/fellows-awarded-arc-linkage-project-grants>



Emeritus Professor Chris Rizos (left) and Professor Brian Kennett AO FAA FRS.

Australian scientists recognised at international geophysics meeting

July 17, 2019

Emeritus Professor Chris Rizos, an observer on the Academy's National Committee for Earth Sciences, was voted in as President-Elect of the International Union for Geodesy and Geophysics (IUGG) during the General Assembly on 16 July.

The IUGG is a non-profit global organisation dedicated to promoting international cooperation in earth sciences.

Through his new role, Professor Rizos hopes to raise visibility of IUGG and communicate its continued relevance for global science, as well as increase engagement with early-career scientists in developing countries.

Professor Elaine Sadler AO FAA, the Academy's Foreign Secretary, commended Professor Rizos on his election and its impact on science in Australia.

"Professor Rizos's appointment is an excellent example of Australia's reputation as an active and valuable member of the international science community," she said, "His service will enhance Australia's

authority on the international stage and cultivate relationships that can facilitate meaningful research."

Professor Rizos is the second Australian President in the union's 100-year history. He is a professor of geodesy and navigation at UNSW Sydney, a member of the bureau of the IUGG, and previously served as Chair on the union's Visioning Committee and the Strategic Planning Committee.

The IUGG meeting also saw Academy Fellow Professor Brian Kennett AO FAA FRS awarded the International Association of Seismology and Physics of the Earth's Interior (IASPEI) Medal 2019 for his contributions to seismology and to IASPEI.

The medal, presented on 13 July, recognises his scientific achievements and efforts to sustain IASPEI goals and activities.

Professor Trevor McDougall AC FAA FRS was also elected President of the International Association for the Physical Sciences of the Oceans (IAPSO), the primary body responsible for maintaining and improving oceanographic standards and practices. Professor McDougall was previously Vice-President of IAPSO and he is Scientia Professor at

the UNSW School of Mathematics and Statistics.

The Academy's involvement in the IUGG General Assembly included a networking reception to celebrate Australian geodesy and geophysics, commemorate the IUGG's centenary and recognise Australia's role as one of the union's nine founding members.

FALLING WALLS LAB

Falling Walls Lab Australia 2019: Three minutes that could change the world

Falling Walls is an **international three-day conference held in Berlin**¹⁸ each year that was inspired by the fall of the Berlin Wall on 9 November 1989. The question of every Falling Walls gathering is: **Which walls will fall next?** Falling Walls fosters discussion on research and innovation and promotes the latest scientific findings among a broad audience from all parts of society.

The Falling Walls Lab is an international forum for the next generation of outstanding innovators and creative thinkers that takes place in over 55 countries annually.

Join the audience in Canberra

On 3 September 2019, the Australian Academy of Science

will host the fourth **Falling Walls Lab Australia**¹⁹ at the iconic Shine Dome in Canberra, and free registration to be part of the audience is now open.

The Australian Lab is a challenging and inspiring format for emerging bright minds, giving them a unique chance to become the next big success story in innovation. Presenters will compete in the challenge, each giving a three-minute presentation on their research, business model or initiative. The panel of eminent judges from academia, business government and finance will select the winner of the Lab. The distinguished jury will be chaired by Dr Alan Finkel AO FAA FTSE, Australia's Chief Scientist.

The Australian Lab winner will receive a return trip to Berlin and entry to the Falling Walls Conference and side events. The winner will represent Australia and give their 3-minute presentation at the Falling Walls Lab Finale as one of

the 100 finalists selected from Labs across the globe.

Fast-paced and exciting

The Lab is a fast-paced and exciting event for the audience and is accessible to anyone. As the presenters could be researchers, social scientists, academics, entrepreneurs or professionals across all disciplines, the Lab promises to be an inspiring and motivating event for everyone!

Who can attend

Anyone can join the audience—entry is free and includes catering. However, book early as seats are limited and will fill quickly!

Book your seat²⁰

Date and time

Tuesday 3 September 2019.

Registrations open at 12:00 pm. The event ends at 7:00 pm

Lunch from 12:30–1:30 pm

Falling Walls Lab from 1:30–5.30 pm

Cocktail reception from 5.30–7.00 pm

Call for expressions of interest for new national QueersInScience network

July 29, 2019

The Australian Academy of Science and QueersInScience are inviting expressions of interest for a new national QueersInScience network.

Individuals who are passionate about advocating for LGBTQIA+ people within science, technology, engineering, mathematics and medicine (STEMM) organisations can apply to become state champions as part of a steering committee that will shape the formation, direction and vision of the network.

The national QueersInScience network is a new initiative supported by the **Theo Murphy Initiative (Australia)**²¹ and will build on the achievements of **QueersInScience**²², a Melbourne-based association that champions inclusion of LGBTQIA+ individuals



Falling Walls Lab Australia is exciting and inspiring for participants and audience alike. Photo credit: Bradley Cummings Photography



Academy Chief Executive Anna-Maria Arabia speaks at the inaugural LGBT STEMM Day symposium.

19 <https://www.science.org.au/opportunities/travel/grants-and-exchange/falling-walls-lab-australia>

20 <https://www.eventbrite.com.au/e/falling-walls-lab-2019-australian-finale-tickets-63828775586>

21 <https://www.science.org.au/news-and-events/events/theo-murphy-initiative-australia>

22 <http://queersinscience.org.au/>

working in STEM organisations in Victoria.

The call for applications was officially announced by the Academy's Chief Executive Anna-Maria Arabia at the first ever LGBT STEM Day Symposium in Melbourne on 5 July. Ms Arabia highlighted that this initiative "will be an invaluable opportunity to take steps to improve the visibility of emerging and established LGBTQ+ individuals in STEM".

"By establishing a nationwide network, we can create a sense of connection and belonging, but also, we can start to better understand and address the systemic barriers affecting participation by LGBTQ+ scientists," she said, "Together the state champions will form a steering committee, which will work to determine the direction and goals for a national QueersInScience network."

The initiative will be shaped and driven by the LGBTQ+ community, with support from the Academy.

Expressions of interest from various parts of the community are strongly encouraged, including from those who identify as Aboriginal or Torres Strait Islander, work outside the university sector, or reside and/or work in a non-metropolitan area.

To get involved as a state champion submit **an expression of interest**²³ by Sunday 18 August 2019.



Professor Noel Cressie FAA.

Academy Fellow appointed to Australian Antarctic Science Council

July 29, 2019

Academy Fellow Professor Noel Cressie has been appointed as one of two independent members of the newly established Australian Antarctic Science Council.

The council, established under the Australian Antarctic Division, provides strategic direction for the Australian Antarctic Program and oversees science funding.

The chair of the Academy's National Committee for Antarctic Research, currently Professor Steven Chown of Monash University, will hold an ex-officio position on the council, alongside the CEOs and chief scientists of Australia's major government research organisations.

More about the new Australian Antarctic Science Council²⁴

The Academy and the Australian Antarctic Division work closely together through the National Committee for Antarctic Research. The National Committee also has strong links to the Scientific

Committee for Antarctic Research (SCAR) of the International Science Council, of which Professor Chown is the current president.

SCAR COMNAP 2020, the world's largest Antarctic science conference, is being jointly hosted by the Australian Antarctic Division, the State Government of Tasmania and the Academy in Hobart from 31 July to 11 August 2020.

More about SCAR COMNAP²⁵

New volume of Historical Records of Australian Science published

July 29, 2019

The **second**²⁶ of two issues comprising Volume 30 of the Academy's Historical Records of Australian Science journal is now available.

The issue includes a two-part analysis of CSIRO's land resource surveys conducted in collaboration with local people in the Territory of Papua and New Guinea (pre-1975) and Papua New Guinea (PNG, post-1975). Another paper introduces CSIRO's new oral history project.

There are three papers exploring the work of German naturalist Lothar Becker, who visited Australia twice in the 19th century.

Finally, the issue also features book reviews and biographical memoirs of late Academy Fellows. The three profiled Fellows include geophysicist Professor Anton Hales, molecular biologist Professor Tony

23 <https://www.science.org.au/news-and-events/events/theo-murphy-initiative-australia/national-queersinscience-network>

24 <http://www.antarctica.gov.au/news/2019/new-australian-antarctic-science-council-meets>

25 <https://www.scarcomnap2020.org/>

26 <https://www.publish.csiro.au/hr/issue/9507>



Late Academy Fellows remembered with biographical memoirs in *Historical Records of Australian Science*. Top row (L-R): Professor Anton Hales, Professor Jan Anderson, Professor Tony Linnane and Professor Bryan Womersley. Bottom row (L-R): Professor George Szekeres AM, Professor Joe Gani and Emeritus Professor Robin Stokes.

Linnane and algal biologist Bryan Womersley.

Together, the two issues released in 2019 contain original scholarly work, biographical memoirs of deceased Academy Fellows, book reviews, and a comprehensive annual bibliography.

The **first issue, published in January**²⁷, featured biographies for plant biologist Professor Jan Anderson, mathematicians Professor Joe Gani and Professor George Szekeres, and physical chemist Emeritus Professor Robin Stokes.

Contributed work profiled the work of botanical collector Edward Bowman, a pioneer settler in Queensland in the mid-19th century.

Original research analysed how CSIRO supported, influenced and transferred technological advances to Australian industry between

1949 and 1979. Future articles will examine other time periods.

Historical Records of Australian Science is the Academy's biannual journal covering the history of pure and applied science in Australia, New Zealand and the southwest Pacific.

Read the latest issue of *Historical Records of Australian Science*²⁸

Australian science celebrated at major international meetings

July 29, 2019

In July, the Academy hosted two reception evenings at major international scientific meetings.

The first, on 8 July, was 'A celebration of Australian chemistry' at the International Union for Pure and Applied Chemistry (IUPAC) World Chemistry Congress in Paris, France.

On 12 July, the Academy presented a reception at the International Union of Geodesy and Geophysics (IUGG) General Assembly in Montréal, Canada.

These receptions celebrated contributions made by Australia to the respective fields, highlighted research and industry opportunities, and facilitated networking.

Attendees included high-level members of IUPAC and IUGG, and past-Presidents of the World Meteorological Organization and the International Council for Science.

The IUPAC reception was co-hosted by the International Younger Chemists Network. The evening featured an address by First Secretary of the Australian Embassy Ken Xie about science diplomacy and international scientific cooperation.

²⁷ <https://www.publish.csiro.au/hr/issue/9505>

²⁸ <https://www.publish.csiro.au/hr>



Delegates at the IUGG reception celebrate 100 years of Australian geodesy and geophysics.



Academy Fellow Professor Frances Separovic AO hosts the Australian reception at the IUPAC World Chemistry Congress.

Selected submissions from the **scienceXart: elements in everyday life**²⁹ competition were also showcased throughout the night (the outcome of the competition will be covered in the August newsletter). As part of 2019 celebrations for the International Year of the Periodic Table, this competition asked Australian school students to submit an artistic response showing ‘elements in everyday life’.

Both IUPAC and IUGG celebrate their centennials this year. As one of the nine founding member countries of IUGG, this also marks the 100th year of Australia’s involvement with the union.

The IUGG General Assembly also saw Emeritus Professor Chris Rizos, an observer on the Academy’s National Committee for Earth Sciences, **voted in as President-Elect of the union**³⁰.

The Academy’s continued membership of these unions comes following a **report**³¹ released earlier this year on the benefits of involvement with the International Science Council and its associated international unions.

The Academy thanks all those who attended and made the receptions such successful celebrations of Australian science.

How to improve your memory, a deep-space mystery and the origins of air pollution

July 29, 2019

The Academy’s Curious project continues to inform and inspire with engaging video and written content designed for social media.

Here are some highlights from our growing catalogue of science stories.

Scientists from CSIRO pinpointed the origin of an astronomical mystery. Research from the ASKAP radio telescope in Western Australia has provided clues about ‘fast radio bursts’ (FRBs).



Watch ‘An unsolved mystery in outer space’: <https://youtu.be/eNNI-XE16XU>

In the wake of the 2019 flu season, this short video reminded us of the importance of yearly vaccinations.



Watch ‘Flue shots: why you need one every year’: <https://youtu.be/xS8w7KxoDBQ>

As we celebrated the 50-year anniversary of Apollo 11, the Academy highlighted the contributions of Aussie scientists.



Watch ‘50 year moonwalk anniversary’: <https://youtu.be/v1ft49dCn8U>

And finally, what does science have to say about improving your memory?



Watch ‘How to improve your memory’: <https://youtu.be/iwEPuV6tzUI>

29 <https://www.science.org.au/supporting-science/national-committees-science/national-committee-chemistry/competition>

30 <https://www.science.org.au/news-and-events/news-and-media-releases/australian-scientists-recognised-international-geophysics>

31 <https://www.science.org.au/supporting-science/science-policy-and-sector-analysis/reports-and-publications/international-science-council-and-international-scientific-unions>



'Managing expectations' workshop facilitated by Professor Shelda Debowski at Macquarie University.

The Academy's science writers tackled topics ranging from **meningococcal disease**³² to **Neanderthal teeth gunk**³³ and **air pollution**³⁴.

To see more Curious content:

- **visit the Curious website**³⁵
- **join the 1.5 million-strong audience on Facebook**³⁶
- **follow the Academy on Twitter**³⁷
- **follow the Academy on Instagram**³⁸

EMCRs gain skills to build successful careers

July 29, 2019

Stage one of the **STEM Transferable Skills Toolkit**³⁹ program, supported through the Theo Murphy Initiative (Australia), delivered four face-to-face workshops at Deakin University and Macquarie University in May and June.

More than 90 early- and mid-career researchers (EMCRs) had the

opportunity to join one or more of the workshops either face-to-face or online.

The workshops covered a variety of skills useful for becoming more effective at prioritising tasks, managing expectations, demonstrating achievement, and inspiring and motivating others.

Delivery of the workshops was made possible thanks to Deakin University and Macquarie University. Additionally, the professional development facilitators Professor Kylie Ball, Professor Shelda Debowski, Dr Shari Walsh and Professor Larry Marlow provided valuable insights for thinking strategically about skills beyond the research context.

The main goal of the STEM Transferable Skills Toolkit program is to equip future STEM leaders across Australia with the skills needed to forge successful career paths—irrespective of discipline, sector, and profession.

Stage two of the program involves the development of four e-learning modules. This will be undertaken over the coming months and the resulting modules will be freely accessible to all EMCRs in STEM.

Join the EMCR Forum⁴⁰ for updates about the STEM Transferable Skills Toolkit and more.

Opportunities for scientists

July 29, 2019

External awards

2020 Australian of the Year Awards

Celebrates the contributions of those leading Australians who excel in their chosen field or who make outstanding achievements for the betterment of others.

Applications close 31 July 2019

More information on the 2020 Australian of the Year Awards⁴¹

Millennium Technology Prize

The Millennium Technology Prize is presented every two years and awarded for a technological breakthrough made anywhere in the world. The innovation shall help to solve the great challenges of humanity while also being environmentally sustainable—€ 1 million

Applications close 31 July 2019

More information on the Millennium Technology Prize⁴²

32 <https://www.science.org.au/curious/people-medicine/all-about-meningococcal-disease>

33 <https://www.science.org.au/curious/people-medicine/what-did-neanderthals-eat>

34 <https://www.science.org.au/curious/people-medicine/where-does-air-pollution-come>

35 <https://www.science.org.au/curious/people-medicine/all-about-jellyfish-stings>

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

37 https://twitter.com/Science_Academy

38 <https://www.instagram.com/ausacademyofscience/>

39 <https://aas.eventsair.com/transferable-skills-toolkit/>

40 <https://www.science.org.au/supporting-science/early-and-mid-career-researchers-0/emcrs/emcr-membership-registration>

41 <https://www.australianoftheyear.org.au/nominate/>

42 <https://taf.fi/millennium-technology-prize/>

Abel Prize

The Abel Prize recognises outstanding scientific work in the field of mathematics, including mathematical aspects of computer science, mathematical physics, probability, numerical analysis and scientific computing, statistics, and applications of mathematics in the sciences—US\$1 million

Applications close 15 September 2019

More information on The Abel Prize⁴³

CSIRO Indigenous STEM Awards

The Indigenous STEM Awards recognise, reward and celebrate the achievements of Aboriginal and Torres Strait Islander students and scientists who are studying and working in the science, technology, engineering and mathematics (STEM) field, as well as the integral role schools, teachers and mentors have in supporting Aboriginal and Torres Strait Islander students in pursuing STEM education and careers. The awards also recognise the immense value of connecting Aboriginal and Torres Strait Islander students with inspirational STEM role models, both Indigenous and non-Indigenous.

Applications open 2 September and close 27 September 2019

More information on the CSIRO Indigenous STEM Awards⁴⁴

Balliet Latour Health Prize



The prize recognises outstanding scientific achievements in biomedical research for the benefit of human health. Theme for 2020: Metabolic Disorders—€250 000

Applications close 30 September 2019

More information on the Balliet Latour Health Prize⁴⁵

More external awards and prizes⁴⁶

Fellows update—July 2019 July 29, 2019

Honours and awards to Fellows

Emeritus Professor Brian Kennett AO FAA FRS—International Association of Seismology and Physics of the Earth's Interior (IASPEI) Medal 2019

Professor Frank Caruso FAA FRS—Leverhulme Medal 2019, Royal Society

Professor Denis Evans AM FAA—Lennard-Jones Lectureship and Prize, Royal Society of Chemistry

Upcoming events

Changing lives with science— Sounds through science: cochlear implants

Professor Jennie Brand-Miller⁴⁷ (University of Sydney) and **Professor Graeme Clark AC⁴⁸** (University of Melbourne)

As the driving force behind the development of the cochlear implant Academy Fellow, **Professor Graeme Clark's** science has profoundly changed the lives of hundreds of thousands of people for the better. Growing up, he witnessed his deaf father's desire for greater connection with others. This experience gave him a goal—to find a way to help the deaf hear—and motivated him through decades of challenging research that continues to this day.

Graeme will be joined by pioneering nutritionist **Professor Jennie Brand-Miller**, who received cochlear implants after gradually losing her hearing as a teen. Without them, Jennie says she would not be where she is

43 <https://www.abelprize.no/c53676/artikkel/vis.html?tid=53705>

44 <https://www.csiro.au/en/Education/Programs/Indigenous-STEM/Programs/AWARDS>

45 https://www.frs-fnrs.be/docs/Prix/FRS-FNRS_Call_for_nomination_Health_Prize.pdf

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

47 <https://sydney.edu.au/science/people/jennie.brandmiller.php>

48 <https://clarkinstitute.unimelb.edu.au/profile/>

today: internationally recognised for her ground-breaking work that developed the 'glycaemic index', a bestselling author, and an Academy Fellow. Join us as Jennie speaks candidly about her journey with the life-changing science and technology of cochlear implants.

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

With thanks to our Exclusive Presenting Partner, University of Canberra.

This is the fourth event in a six-part series. Throughout this series we will hear remarkable untold science stories. Join us for tales of innovation, research, breakthroughs, and how science is solving the big challenges of our time. Visit the academy's event page for more information and tickets to other talks.

Date: Tuesday 13 August 2019

Time: 5.30pm-7.00pm

Location: The Shine Dome

Price: \$15 per person

Please note that Auslan interpreters will be supporting this event, and the venue is equipped with infrared hearing assistance.

Book tickets⁴⁹

BeakerStreet@TMAG

The Australian Academy of Science is a proud partner of **BeakerStreet@TMAG**⁵⁰. Join the Academy for four fascinating talks at Hobart Town Hall, featuring Academy Fellows, Professor Martina Stenzel, Dr Steve Rintoul, Professor Jenny Graves and Professor Mike Archer. Following



Professor Martina Stenzel FAA



Dr Steve Rintoul FAA



Professor Jenny Graves AO FAA



Professor Mike Archer AM FAA

each talk, all guests are invited (and musically escorted!) across the road to Tasmanian Museum and Art Gallery for more science, including talks, workshops, art, music, food, bars and more. Tickets to each talk are sold separately.

BeakerStreet@TMAG: The Chemistry of Life

Professor Martina Stenzel on stage, MC'ed by ABC's Natasha Mitchell

The mind boggles at the diversity of chemical elements that make up our bodies, the world around us, and the objects we use every day. As we celebrate the 150th birthday of the periodic table, Professor Martina Stenzel FAA will unveil the hidden genius of this chart and bring to life the weird and wonderful elements it describes.

Based at UNSW Sydney, Martina designs long, chain-like molecules called polymers for biomedical applications. Her research ranges

from figuring out new ways to synthesise polymers, to using these polymers in medicine. She combines her polymers with sugars, proteins and drug molecules to create smart nanoparticles for drug delivery.

Speaker: Professor Martina Stenzel FAA

Date: Friday 16 August

Time: 5:30pm

Book ticket⁵¹

BeakerStreet@TMAG: Ice, wind and waves: in search of climate clues in the Southern Ocean

Join us to hear Dr Steve Rintoul FAA in conversation with ABC's Professor Robyn Williams AM FAA, about how the Southern Ocean drives the earth's climate and how the fate of Antarctica depends on choices we make today.

Steve is a physical oceanographer and climate scientist with a long-standing interest in the Southern

49 <https://www.eventbrite.com.au/e/changing-lives-with-science-august-tickets-53416117044>

50 <https://www.beakerstreet.com.au/beakertmag>

51 <https://www.eventbrite.com.au/e/the-chemistry-of-life-tickets-64519337074>

Ocean and its role in the earth system. Born and educated in the USA, he has worked at CSIRO in Hobart since 1990. He uses floats, seals, satellites and ships to discover how the Southern Ocean works and its impact on the climate of Australia and the rest of the globe.

Speaker: Dr Steve Rintoul FAA

Date: Friday 16 August

Time: 6:30pm

Book tickets⁵²

BeakerStreet@TMAG: The future of men?

Join Professor Jenny Graves AO FAA in conversation with ABC's Professor Robyn Williams AM FAA to find out how her research on Australian animals has transformed our understanding of how genomes of humans and all vertebrates evolved and function, particularly in determining sex. In the course of her work, she has kick-started genomic and epigenetic research in Australia, and is (in)famous for predicting the extinction of the male Y chromosome.

Jenny is based at La Trobe University. She has produced books and many research articles, and also writes science articles and columns – on sex, evolution, and women in science – for the public. She is a Fellow of the Australian and USA academies of science, the 2006 L'Oreal-UNESCO Laureate for Women in Science, and the recipient of the 2017 Prime Minister's Prize for Science (the first woman to win solo).

Speaker: Professor Jenny

Graves AO FAA

Date: Friday 16 August

Time: 7.30pm

Book tickets⁵³

BeakerStreet@TMAG: Bringing back the dead: why extinction should not have to be forever

Professor Mike Archer on stage, MC'ed by ABC's **Natasha Mitchell**

Michael Crichton said he wrote Jurassic Park to scare people into never thinking about trying to bring back extinct animals. Few books written with the purpose of controlling behaviour have ever failed as spectacularly as that one. Despite his scaremongering, he planted in the minds of many of the brightest kids, the same kids who cowered in the movie seat as T. rex gobbled the 'blood-sucking lawyer' off the toilet seat, determination to do precisely what Crichton railed against. Today there are many projects underway all focused on the once entirely science fiction concept of bringing extinct animals—and plants—back to life. Some are using intact genomes to produce hybrid cells such as the Lazarus Project focused on Australia's Gastric-brooding Frogs. Others, such as the Thylacine, Mammoth and Passenger Pigeon Projects, are using new technologies to retroengineer modern genomes to match sequences found in ancient DNA. Some, such as the Auroch Project, are identifying and reactivating silent genes to recover ancestral genomes. There

are many technical and some ethical challenges, but there are also many biological, ecological and potentially enormous conservation benefits for living, threatened species. Restoration of ecosystem function can be one of the major gains if DeExtinction efforts are successful. In this seminar, Academy Fellow, Professor Mike Archer AM FAA will overview progress on the Thylacine Project and the ongoing Lazarus Project.

Speaker: Professor Mike

Archer AM FAA

Date: Friday 16 August

Time: 8.30pm

Book tickets⁵⁴

The future of coasts: Early-career researcher and practitioner forum and workshop

Future Earth Australia and the Australian Climate Change Adaptation Research Network for Settlements and Infrastructure together with Climate-KIC are hosting a two-day forum and workshop on the Gold Coast on Monday 19 August and Tuesday 20 August. The aim of this event is to bring together early career researchers and practitioners to share their work and network across disciplines.

This event will provide a unique opportunity for those conducting research or practising in engineering, science, urban planning, the built environment, social sciences, economics and business to meet fellow researchers and practitioners from other

52 <https://www.eventbrite.com.au/e/ice-wind-and-waves-in-search-of-climate-clues-in-the-southern-ocean-tickets-64519868664>

53 <https://www.eventbrite.com.au/e/the-future-of-men-tickets-64583408714>

54 <https://www.eventbrite.com.au/e/bringing-back-the-dead-why-extinction-should-not-have-to-be-forever-tickets-64583895169>

Australian institutions and facilities. Due to the event's proximity to the **7th Queensland Coastal Conference**⁵⁵, this event will also focus on the coastal environment and the challenges we collectively face in shaping, managing, and conserving the coast.

Participation is open to early career researchers, practitioners in industry or government, and students (Hons, Masters or PhD) with an interest in coasts. This workshop has been purposefully kept small, with a maximum of 20 applicants selected to participate, to ensure that each participant has the chance to listen to and speak with all the other participants and thereby build lasting connections within the coastal field.

Successful applicants from Future Earth Australia member organisations (full list here) who do not live within reasonable driving distance to Griffith University, Gold Coast Campus, will be eligible for a travel allowance of up to \$300 towards a return domestic flight from their city of origin. Accommodation, lunch and a welcome dinner will be fully provided.

Submission guidelines

To apply, email the application form with an abstract of up to 250 words to **futureearthaustralia@science.org.au** by 11.59pm Sunday 14 July 2019. Nominate one referee (academic, industry or government) to support your submission.

Your abstract or proposed presentation should clearly identify your research area of interest (as per the list below):

1. Coastal planning, management and communities
2. Coastal restoration
3. Coastal conservation
4. Coastal response to extreme events and to climate change
5. Other coastal research (please specify in your application)

Successful applicants will be required to give a 10-12 minute presentation expanding on their abstract and to contribute to the forum/workshop discussions with fellow participants and forum partners.

Download application form⁵⁶

A 'hypothetical' on climate change: the science and the law

A panel of experts on the science and the law relating to climate change will be asked questions by Justin Gleeson sc of the New South Wales Bar on this important topic.

The Panel

- Professor Lesley Hughes, Pro Vice-Chancellor (Research), Macquarie University
- Professor David Karoly FAA, Leader of the NESP Earth Systems and Climate Change Hub, based in CSIRO
- Professor Rosemary Lyster, Professor of Climate and Environmental Law, University of Sydney Law School

- Professor Jacqueline Peel, Professor of Law, University of Melbourne Law School
- Professor Will Steffen, Emeritus Professor, Australian National University
- Professor Erika Techera, Professor of Environmental Law, University of Western Australia Law School

Event details

Date: 5:00pm, Thursday, 22 August 2019

Venue: Federal Court – Court No 1, Level 21 Law Courts Building, Queen's Square, Sydney

Cost: Free for Academy Fellows, \$25 for non-fellows

Please register by 15 August.

Visit the **AAL website**⁵⁷ or email **AALSecretariat@academyoflaw.org.au** for more information.

Acknowledgement

Many thanks to Professor Yuri Estrin FAA, Honorary Editor of the Academy newsletter.

55 <https://www.qcc2019.org/>

56 <https://www.science.org.au/files/userfiles/support/future-earth-australia/application-form-august-final.docx>

57 <http://www.academyoflaw.org.au/event-3429043>