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NEWSLETTER

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Message from the Chief Executive

April 30, 2019

This month, the Minister for Innovation, Science and Technology, the Hon Karen Andrews MP, **launched the Academy's Women in STEM Decadal Plan¹** at Parliament House. The launch of the ten-year plan marks the start of long term action in the Australian science, technology, engineering and mathematics (STEM) sector aimed at achieving gender equity in STEM.

Attracting women and girls to STEM, and providing an environment for them to thrive and progress, is essential for Australia's future. It is a shared responsibility of government, academia, the education system, industry, and the community, and the Academy is now focusing on implementing the Plan within its own activities and supporting others in the STEM sector to do what they can to achieve gender equity in STEM.

The Academy of Science worked with the Australian Academy of Technology and Engineering over a short six months to bring the plan to fruition—a major feat for a national, cross-sectoral framework. I congratulate all those involved, and look forward to working with you as we turn the tide of gender equity in science.

Encouraging the nomination of diversity candidates for the Fellowship and awards² is always a high priority for the Academy, however, at this time of year we ask you to consider yourself or someone you know to nominate for these opportunities. **Information on nominating diverse candidates for Fellowship³**

Next month the Academy will host its annual celebration of science, **Science at the Shine Dome⁴**. If you are considering attending please do not delay registration as it's only a month away and places are filling fast.

Enjoy the April newsletter.

Anna-Maria

Under-representation of women in STEM is holding back national prosperity

April 01, 2019

Australia has not yet made the systemic changes required to achieve diversity in science, technology, engineering and mathematics (STEM), with the current under-representation and under-utilisation of women in the STEM workforce posing a threat to Australia's prosperity.

The findings are contained in the Women in STEM Decadal Plan launched this evening at Parliament House by the Minister for Industry, Science and Technology, Karen Andrews. The plan was developed by the Australian Academy of Science in partnership with the

1 <https://www.science.org.au/news-and-events/news-and-media-releases/under-representation-women-stem-holding-back-national>

2 <https://www.science.org.au/about-us/diversity-and-inclusion>

3 <https://www.science.org.au/fellowship/election-academy>

4 <https://www.science.org.au/news-and-events/events/science-shine-dome-2019>



Watch the Women in STEM Decadal Plan Curious video: <https://youtu.be/3HQwualcdC8>

Australian Academy of Technology and Engineering.

It outlines six opportunities to strengthen gender equity in STEM in Australia over the next 10 years, including establishing a national evaluation framework to guide decision making and drive investment and effort into STEM measures that work.

Australian Academy of Science Fellow and Expert Working Group member, Professor Sue O'Reilly AM FAA, said while many organisations are taking actions at an individual level to support the attraction, retention and progression of women in STEM, extensive stakeholder consultations confirmed there is an urgent case for cohesive, systemic and sustained change.

"Change can commence at the grassroots and this should not be discouraged. However, the systemic and sustained change required to make a step change in achieving gender equity in Australia will primarily occur when led and

championed from the top," Professor O'Reilly said.

The decadal plan highlights the economic case for gender equity, citing the 2017 World Economic Forum's 'Gender gap report' which estimates that closing the gender gap in economic participation by 25% by 2025 could add as much as US\$5.3 trillion to global gross domestic product (GDP) in the same timeframe.

"It's not just an equality perspective that's important here, it's a business imperative," said Australia's first ambassador for Women in STEM, Professor Lisa Harvey-Smith.

"Australia needs to be the clever country again. We need to be getting those large tech companies to stay in Australia and we need to be developing business capabilities around the new economies and become worldwide competitive again."

Dr Bruce Godfrey, Vice President of Diversity at the Australian Academy of Technology and Engineering, said the plan provides the first opportunity to tackle the issue of

gender equity at a national scale and highlights the importance of government, academia, industry, the education sector and the community working together to drive change.

"If this plan and the opportunities contained within it are realised, the STEM graduates of 2030—9- and 10-year-olds making their way through primary school in 2019, as well as those entering the workforce from other life journeys—will join workplaces that are respectful, free of harassment and discrimination, value diversity, and structured to support a variety of STEM careers that include women in leadership positions," Dr Godfrey said.

The starting point for the implementation of the plan is a Pathways to Equity in STEM workshop hosted by the academies in Melbourne on 3 April. It will provide an opportunity for delegates to learn what other organisations are doing in the gender equity space, providing a platform for both learning and collaboration.

Read the Women in STEM Decadal Plan⁵

Academy welcomes government strategy to advance women in STEM

April 07, 2019

The Australian Academy of Science has applauded the Australian Government's 'Advancing Women in STEM' strategy released today by Minister for Industry, Science

5 <http://www.science.org.au/womeninSTEMplan>

and Technology the Hon Karen Andrews MP.

Advancing Women in STEM responds to the issues outlined in the Women in STEM Decadal Plan released on 1 April 2019 by the Academy of Science and the Academy of Technology and Engineering, and outlines the Government's commitment and the role it plays in supporting increased gender equity across the STEM sector.

The Academy supports the three key areas of focus presented in the strategy, which are closely aligned with the Women in STEM Decadal Plan: enabling STEM potential through education; supporting women in STEM careers; and making women in STEM visible.

The Government's women in STEM strategy also outlines the broad range of programs and initiatives led or supported by the Australian Government to support girls and women in STEM.

This includes \$1.8 million new funding announced in the 19/20 Federal Budget to support the Science in Australia Gender Equity (SAGE) initiative, a unique transformative national gender equity program designed to achieve sustained change via ongoing evaluation and a national accreditation framework.

President of the Academy of Science Professor John Shine AC said that the Australian Government has a leadership role as an employer of women with STEM qualifications; as a provider of STEM education;

and in its role in developing policies and funding programs to achieve gender equity.

"The Australian Government's unique role in modelling and encouraging best practice is a powerful lever for change.

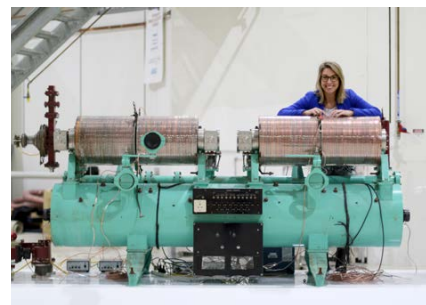
"The Advancing Women in STEM strategy clearly articulates a leadership role for the Australian Government and acknowledges the importance of working with stakeholders across the STEM ecosystem to achieve gender equity in STEM in Australia.

"It is particularly pleasing to see the government's ongoing commitment to the SAGE program which is bringing about sustained change in the higher education and research sector.

"The Academy applauds the development of best-practice guidelines for government grant programs so that they are administered in such a way that does not disadvantage women.

"To meet the rising demand for STEM skills, attracting women and girls to STEM and providing an environment for them to thrive and progress is a shared responsibility of government, academia, the education system, industry and the community.

"The Academy of Science looks forward to working closely with the Australian Government to deliver a strategic, sustained and evidence-based approach to tackling gender inequity in STEM," Professor Shine concluded.



Dr Katie Sizeland uses synchrotron based techniques to investigate the nanostructure of collagen biomaterials. Image: ANSTO

The **Women in STEM Decadal Plan**⁶ was developed by the Australian Academy of Science in collaboration with the Australian Academy of Technology and Engineering and offers a vision and six opportunities to guide government, academia, industry, the education sector and the community as they go about taking actions to build the strongest STEM workforce possible to support Australia's prosperity.

Academies take first step to implement Women in STEM 10-year plan

April 30, 2019



Members of Women in STEM Decadal Plan Expert Working Group, project team and UniBank representatives celebrating the Pathways to Equity in STEM event.

A national symposium held just days after the **launch of the Women in STEM Decadal Plan**⁷ brought leaders from across the STEM ecosystem together to identify opportunities to

6 <https://www.science.org.au/support/analysis/decadal-plans-science/decadal-plan-women-stem>

7 <https://www.science.org.au/news-and-events/news-and-media-releases/under-representation-women-stem-holding-back-national>

increase the representation of women in STEM.

Organised by the Australian Academy of Science and the Australian Academy of Technology and Engineering, **Pathways to Equity in STEM**⁸ enabled organisations to share current strategies and programs, discuss ways to collect and evaluate data to support effective actions, and define their next steps.

In her keynote address Professor Lisa Harvey-Smith, the Australian Government's Women in STEM Ambassador, called for organisations to take action and write a formal organisational response to the Women in STEM Decadal Plan.

The event revealed priority areas for development, including a need for a central repository for capturing information and evaluation, and addressing issues relating to intersectionality.

UniBank was the symposium's exclusive presenting partner. UniBank General Manager, Mike Lanzing said UniBank was very pleased to support such an important event.

'UniBank is a proud supporter of the academies' 10-year plan to encourage gender diversity in STEM. We believe cross-institutional partnerships are vital if we are going to increase the numbers of women choosing STEM careers. We stand with the academies and the action plan to reach gender equity across Australian business and academic community.'

Subscribe to receive updates⁹ on the implementation process, including opportunities to contribute.

Mixed news for science in the 2019-20 Budget

April 03, 2019

The 2019-20 Federal Budget contains mixed news for science, with a number of very welcome announcements along with some cuts to research programs.

Positive measures include \$3.4 million new funding to support women in STEM, including the Science in Australia Gender Equity (SAGE) initiative led by the Australian Academy of Science and the Australian Academy of Technology and Engineering.

Also included are a raft of initiatives through the Medical Research Future Fund, \$25 million new funding for coastal, environment and climate research, \$56 million for nuclear medicine and waste management, \$5 million for a dark matter particle research facility, \$15 million for expanded outreach and education activities through Qwestacon, and \$19.5 million over four years to establish a Space Infrastructure Fund.

Negatives include the abolition of the \$3.9 billion Education Investment Fund which could have been used to support strategic research infrastructure; and savings of almost \$50 million from the entrepreneurship and industry research programs.

President of the Academy of Science, Professor John Shine AC, said that while the Academy applauded the range of new initiatives, it was hoped that there would be more focus on science and innovation in the budget given the Government's emphasis on knowledge and skills.

"It is counterintuitive to seek to produce a surplus by cutting the knowledge economy. The reductions in indexation of research programs over the forward estimates, resulting in cuts of \$345 million to university research funding remain concerning," Professor Shine said.

"Given the Government's focus on economic growth it is disappointing that some of the very welcome announcements in this budget went hand in hand with some cuts to Australia's research programs" Professor Shine said.

FURTHER INFORMATION ON 2019-2020 SCIENCE BUDGET MEASURES

Major science initiatives announced or elaborated in the Budget include:

- **\$56.4 million over three years to the Australian Nuclear Science and Technology Organisation** to support nuclear medicine production, critical radioactive waste management and nuclear decommissioning activities, and asset management. The Government will also provide an equity injection of \$56 million to ensure the continued protection

8 <https://www.science.org.au/support/analysis/decadal-plans-science/decadal-plan-women-stem/pathways-equity-stem-first-step>

9 <https://www.science.org.au/support/analysis/decadal-plans-science/decadal-plan-women-stem/women-stem-subscription-form>

of both the community and the environment.

- **\$25 million over four years to establish a coasts, environment and climate science research and education centre** at Point Nepean, Victoria. The centre will be led by Monash University and the University of Melbourne and include an interdisciplinary research facility on marine and coastal ecosystems, climate science and environmental management.
- **\$15.1 million over three years to expand Questacon's education and outreach activities.**
- **\$3.4 million over four years to support women in STEM** through the SAGE Initiative and a digital National Awareness Raising Initiative led by the Women in STEM Ambassador Professor Lisa Harvey Smith.
- **\$19.5 million over four years to establish a Space Infrastructure Fund.**
- **\$5 million over two years to build the Stawell Underground Physics Laboratory** to allow the University of Melbourne to join the global research effort to understand dark matter.
- **Funding of \$2.9 million over three years to facilitate national leadership in agricultural innovation.**
- **\$3.6 million over two years from 2019-20 to trial a National Innovation Games** through which students will work together to solve

innovation, technology and/or digital challenges set by a corporate sponsor.

- **\$0.5 million over five years** (and \$0.1 million ongoing from 2023-24) **to establish an Australian Antarctic Science Council** that would support reform initiatives announced as part of the Government's response to the Australian Antarctic Science Program Governance Review 2017

Savings measures include:

- Abolishing the **\$3.9 billion Education Investment Fund** and using the capital to establish a new Emergency Response Fund.
- Savings of **\$48.9 million over five years from 2018-19 from the Entrepreneurs' Programme and the Industry Growth Centres Initiative.**
- Reductions in indexation of science and research programs over the forward estimates resulting in savings of **\$345 million to university research funding** through the research support program.

Register now for Science at the Shine Dome

April 24, 2019



28–30 May

The Shine Dome, Australian Academy of Science, Canberra

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 Academy will welcome new Fellows, congratulate the recipients of the Academy's honorific awards, and support attendees to celebrate, share and network with Australia's scientific community.

This year is the 65th anniversary of the founding of the Australian Academy of Science and the 60th anniversary of the completion of the heritage-listed Shine Dome. These milestones will be honoured, and the Academy's achievements marked.

Attendees are welcome to register for some or all functions across the three-day event.

The role of science in a sustainable energy future

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

- Scientia Professor Deo Prasad (UNSW)
- Associate Professor Jenny Pringle (ARC Centre of Excellence for Electromaterials Science)
- Dr Mark Ho (ANSTO)
- Professor Karen Hussey (University of Queensland)

- Professor Stuart White (University of Technology Sydney)
- Ms Claire Johnson (CEO, Hydrogen Mobility Australia)
- Professor Kylie Catchpole (Australian National University)
- Associate Professor Gregor Verbic (University of Sydney)
- Associate Professor Claudia Vickers (University of Queensland)

New Fellows

The 2019 new Academy Fellows will be formally admitted to the Australian Academy of Science on Tuesday evening. On Wednesday each new Fellow will present their work and achievements.

Gala dinner and award presentations

The 2019 Gala Dinner will be held on the evening of Wednesday 29 May at the National Museum of Australia, offering attendees the chance to network and celebrate science.

The evening will include the presentation of the prestigious Matthew Flinders Medal to Dr Richard Manchester FAA.

The science celebrations continue with presentations of the 2019 Academy awards on Thursday 30 May.

Early- and mid-career researchers

This year, Science at the Shine Dome will feature a dedicated EMCR program to allow EMCRs more opportunities to connect with their peers, build networks, and take

part in professional development opportunities.

The Academy has **EMCR partnership opportunities available**¹⁰ for workplaces to support EMCR full attendance at the event. **EMCR support packages**¹¹ are available and cover the cost of registration, accommodation and travel expenses, as well as offering promotional opportunities for the EMCR's workplace.

EMCRs are encouraged to discuss this opportunity with their workplace. Contact the Academy for more information: events@science.org.au.

Diversity and inclusion assistance

To facilitate delegate attendance at the event, onsite child minding, accessibility assistance grants and carer grants are available. Those requiring support are encouraged to **apply for assistance**¹² to enable attendance at this unique and inspiring event.

View the event program and register for the event¹³

International science engagement pays dividends for Australia

April 17, 2019

International science engagement pays dividends for Australia

The economic and scientific benefits to Australia's membership of major global science organisations have been outlined



The Australian delegation votes at the International Mathematical Union's general assembly in Rio de Janeiro, 2018. Photo: Ya-Xiang Yuan

in a report released today by the Australian Academy of Science.

The report, Benefits of Australian membership of the International Science Council and International Scientific Unions, also highlights the important role that science has as a soft power asset in diplomacy.

Professor Sir Peter Gluckman, former Chief Science Advisor to the New Zealand Prime Minister, launched the report today in Canberra in his role as President-elect of the International Science Council (ISC). The Australian Academy of Science represents Australia on the International Science Council.

The report shows that Australia benefits as a member of global science organisations by:

- receiving a direct economic return—estimated at \$118 million from 2000 to 2017—through hosting scientific union meetings in Australia and other activities
- receiving indirect benefits such as the invaluable opportunities for Australian scientists, especially young scientists, to collaborate with international

¹⁰ <https://newsletter.science.org.au/t/i-i-nujjhy-l-t/>

¹¹ <https://newsletter.science.org.au/t/i-i-nujjhy-l-i/>

¹² <https://newsletter.science.org.au/t/i-i-nujjhy-l-d/>

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

leaders in ways that greatly accelerate delivery of the long-term economic benefits of scientific progress for Australia

- providing opportunities for Australian perspectives to contribute efforts to use science to solve global challenges
- enhancing Australia's international scientific profile and reputation.

"As members of international science organisations, Australians scientists have the opportunity to help shape science in our region and beyond," said the Academy's Foreign Secretary, Professor Elaine Sadler FAA.

"While Australia benefits from its membership of the International Science Council and the International Scientific Unions, we would derive greater scientific and economic benefits by taking a more strategic approach."

Diplomacy through science also provides benefits to Australia and the national interest is well served when scientific activities open doors and broker dialogue with other nations, especially where geopolitical issues might otherwise slow positive cooperation.

"In Australia science is an under-used element in diplomacy and it is not yet recognised as a key soft power asset, whilst in countries around the world science diplomacy is fast becoming a strategic part of the national tool kit," Professor Sadler said.

Australia has felt the absence of an international engagement strategy for science, technology and innovation with long-term resourcing.

Such a strategy would enable Australia to:

- maintain participation in key international decision-making science bodies
- support bids to attract international scientific conferences to Australia
- contribute to bilateral and multilateral partnerships and research programs where they align with research priorities, or serve our diplomatic objectives
- allow Australia to meet its agreed Sustainable Development Goal obligations
- develop a program for early- and mid-career researchers to establish partnerships with international leaders in their field, building networks that will be beneficial to Australia for decades to come
- expand the network of science counsellors and attachés in Australian embassies in priority countries and regions around the world
- target programs to provide scientific support to assist Australian foreign affairs and trade policy objectives.

International scientific engagement is a key priority included in the Australian Academy of Science priorities for the

2019 federal election: **Earning Our Future**¹⁴.

Since it was formed in 1954, the Academy has received funding from the Australian Government to oversee membership of these organisations on the nation's behalf. It manages these memberships with guidance and assistance from the Academy's 22 National Committees for Science and the more than 450 scientists who are active in various levels of the organisations at any time.

The report, Benefits of Australian Membership of the International Science Council and International Scientific Unions is available here: www.science.org.au/isc-benefits

Professor Elaine Sadler FAA and Sir Peter Gluckman are available for media interview on release of the report at 7.30am AEST Wednesday 17 April.

Background

Australia has been a member of the International Science Council (formerly known as the International Council for Science), since its establishment in 1931. The International Science Council (ISC) serves as an interface between the scientific community and high-level international policy forums, and are important features of the global science and diplomacy landscape.

Specifically, the ISC advances science as a global public good by convening the scientific expertise and resources needed to generate international action on issues of major scientific and public importance; provides advice to

14 <https://www.science.org.au/supporting-science/science-policy-and-analysis/position-statements/earning-our-future-platform>

international bodies such as the United Nations; and champions the universality of science to promote free and responsible conduct of science, by protecting the freedom of movement, association and expression of scientists, ensuring equitable access to data and other resources and supporting capacity development in developing countries.

The ISC has a membership of 40 international scientific unions and associations and over 140 national and regional scientific organisations. On behalf of the Australian Government, the Academy is a member of the Council and 30 of its member bodies.

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Academy re-elected to IAP for Science Executive Committee

April 30, 2019



Emeritus Professor Cheryl Praeger (left) with Professor Cherry Murray, a physicist from Harvard who was elected co-chair of the IAP for Science.

The Australian Academy of Science has been elected to the InterAcademy Partnership (IAP) for Science Executive Committee for a second term of three years.

The IAP held its General Assembly in Seoul, Korea on 11 April. More than 100 representatives from 54 countries attended the assembly, hosted by the Korean Academy of Science and Technology.

Emeritus Professor Cheryl Praeger, the Academy's immediate past Foreign Secretary, attended the assembly as voting delegate of the Academy.

The IAP is a global network of the world's science, medicine and engineering academies that collaborates to advance evidence-based policies and provide independent expert advice on pressing challenges.

The IAP consists of three interconnected networks: Science, Policy and Health. In particular, IAP for Science focuses on the scientific aspects of global issues—such as sustainable development, the theme of the two-day conference that preceded the General Assembly.

Stay warm in the Shine Dome this winter

April 24, 2019

Are you looking for a unique event venue this winter? Embrace the cold and hold your next meeting or conference at the Australian Academy of Science in the centre of the nation's capital!

A Canberra landmark since its construction in 1959, the Shine Dome and its custom-designed furniture were created to reflect the inquiring and innovative

nature of science. It was the first Canberra building to be added to the National Heritage List and has featured in television and movie productions.

Located next to the highly acclaimed New Acton precinct, the Shine Dome is a short walk from four hotels and the Australian National University, and within comfortable walking distance of tourist attractions, cafés, parking and city shops.

There are venue spaces for small to large groups. The grand Ian Wark Theatre is the centrepiece, with a variety of other spaces located on the building's outer curve.

Hot conference packages

The Academy is offering full-day conference packages at the Shine Dome starting from \$49.00 per person¹⁵.

Your guests will enjoy arrival tea and coffee, morning tea, a hot soup-style lunch and mouth-watering afternoon tea. We also provide notepads, pens and complimentary Wi-Fi to support your event.

Contact the friendly and professional team to check availability and discuss your upcoming event.

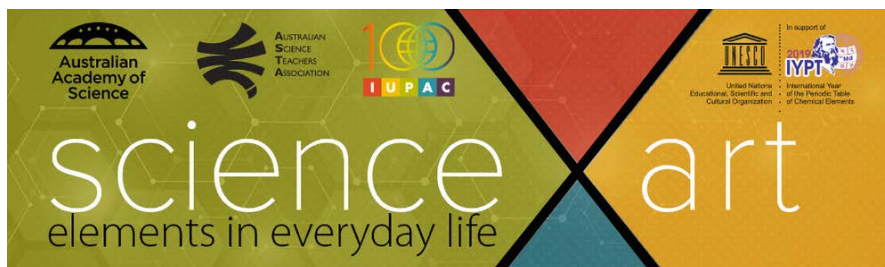
Visit the Shine Dome website for more information¹⁶



Photo: A Chopra

¹⁵ Offer valid for new bookings for May to August 2019 inclusive, minimum numbers apply

¹⁶ <https://www.shinedome.org.au/>



Academy hosts chemistry-themed art competition for school students

April 30, 2019

Get your paintbrushes ready: submissions open soon for scienceXart: elements in everyday life, a chemistry-themed art competition for primary and secondary school students hosted by the Academy's National Committee for Chemistry.

The competition will run over Term 2, 2019 with entry categories suitable for all year levels.

Developed in close partnership with the Academy's education experts and the Australian Science Teachers Association, scienceXart (science and art) establishes clear curriculum links and aligns closely with learning outcomes for Australian students.

The scienceXart competition is part of year-long celebrations for the International Year of the Periodic Table and the 100th anniversary of the formation of the International Union of Pure and Applied Chemistry (IUPAC).

Teachers and classes can **sign up to the mailing list**¹⁷ to keep up to date and receive competition packs. Submissions open 29 April and close 28 June. A selection of

prizes for winning entries will be announced.

More information about scienceXart: elements in everyday life¹⁸

Academy expert panel responds to Government report on fish deaths

April 10, 2019

The Independent Assessment of fish deaths in the lower Darling final **report**¹⁹ released by Minister David Littleproud today is a welcome contribution to the growing evidence base to help inform action to improve the health of Australia's rivers.

ANU Professor Craig Moritz FAA, who chaired the multidisciplinary panel of experts convened by the Australian Academy of Science, said although the scope and expertise of the Government and Academy expert panels differ in parts, there is strong consensus across both reports.

This includes agreement on:

- The immediate causes of the fish kills, with severe drought and extreme temperatures as major contributors, and the latter being attributable to ongoing climate change;

- The strong likelihood that increased upstream diversions have contributed to deteriorating flow regimes in the Darling River;
- The need for improved measurement of all diversions, monitoring of river conditions, and modeling of the system as a whole for management and policy needs, the last including better modeling of the effects of climate change on the Northern Basin;
- The need for Water Resource Plans now under development by NSW and QLD to:
 1. fully consider downstream flow requirements; and
 2. implement active management to ensure that low flows are maintained and that environmental flows are protected and effective.
- The opportunity to rethink how state and federal agencies manage the Menindee Lakes system for improved environmental and social outcomes;
- The need for stronger engagement with local communities in advising on management strategies and participating in their implementation;
- The need to support research that is essential to management actions that will improve understanding of the hydro-ecology of the system, restore

¹⁷ <https://www.science.org.au/supporting-science/national-committees-science/national-committee-chemistry/competition>

¹⁸ <https://www.science.org.au/supporting-science/national-committees-science/national-committee-chemistry/competition>

¹⁹ <https://www.mdba.gov.au/sites/default/files/pubs/Summary-Final-Report-Independent-Panel-fish-deaths-Lower%20Darling.pdf>

and maintain the health of fish populations and enable more effective intervention as critical conditions approach;

- The importance of the Murray Darling Basin Plan as the key instrument for managing water for environmental and social needs.

Professor Craig Moritz said the Academy's expert panel welcomed recent moves by the Murray Darling Basin Authority to increase engagement with local stakeholders, including Indigenous elders, in river management, and to improve the understanding of climate change impacts on the system.

"Announcements from both the Federal Government and Opposition of initiatives to address some of the recommendations from each of the reports are also welcome, though more remains to be done," Professor Moritz said.

"If we are to successfully manage this system, especially as climate becomes more challenging, a bipartisan approach will be important," Professor Moritz said.

Two new Corresponding Members admitted to the Academy

April 02, 2019



Professor Akshay Venkatesh (left) and Professor Krzysztof Matyjaszewski.

Professor Akshay Venkatesh and Professor Krzysztof Matyjaszewski, both based in the United States, have been admitted to the Australian Academy of Science for outstanding scientific contributions.

Professor Venkatesh is an Australian mathematician currently based at the Institute of Advanced Study, Princeton. His work uses number theory—the branch of mathematics that deals with the properties and relationships of numbers—as a 'lens' to approach a range of fields including homogeneous dynamics, arithmetic geometry and representation theory.

According to Professor Venkatesh's citation, "He has solved many long-standing problems by combining methods from seemingly unrelated areas, presented novel viewpoints on classical problems, and produced strikingly far-reaching conjectures."

In 2018, Professor Venkatesh won the Fields Medal—the most prestigious international award in mathematics awarded once every four years to researchers under 40.

Professor Krzysztof Matyjaszewski is a world-leading chemist at Carnegie Mellon University. His fundamental contributions have changed the face of free radical chemistry and polymer science.

In 1994, Professor Matyjaszewski invented a method of polymerisation—a chemical reaction to produce long chain-like molecules—using a copper catalyst. Called atom transfer radical polymerisation (ATRP), Professor

Matyjaszewski's method has spawned a prolific area of research and several industry developments, including the commercial production of specialty materials.

Corresponding Members of the Academy are eminent scientists not resident in Australia. They are elected based on scientific excellence, with consideration given to their connection to Australian science.

The Australian Academy of Science will announce the election of 22 distinguished Australian scientists as New Fellows, to mark the start of **Science at the Shine Dome**²⁰, on 28 May 2019.



Watch the Fields Medal Curious video: <https://youtu.be/yhPmsfbv4Tc>

Asia-Pacific research partnerships set to tackle big challenges

April 05, 2019

Fourteen collaborative research projects will collectively receive \$1.25 million of Australian Government funding as part of the Regional Collaborations Programme, administered by the Australian Academy of Science.

Minister for Industry, Science and Technology Karen Andrews announced successful grant recipients today.

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

The funding is provided under the second round of the \$3.2 million Regional Collaborations Programme, part of the National Innovation and Science Agenda.

The grants will support Australian researchers who are collaborating with Asia-Pacific partners to develop innovative solutions to shared challenges.

Funded projects address a range of health, technological and environmental challenges, including battery recycling, malaria and coastal water quality monitoring.

The largest grant, of \$257,767, goes to the Menzies School of Health Research for a project with collaborators in Bangladesh, Indonesia and the Netherlands aiming to reduce malaria risk in areas where two types of malaria (*Plasmodium vivax* and *P. falciparum*) co-exist.

Other recipients include collaborative research initiatives between:

- CSIRO—Oceans and Atmosphere Business Unit and partners in Singapore and Malaysia to develop a digital Earth observation-based solution to improve monitoring and management actions for coastal water quality (\$228,390)
- Asbestos Diseases Research Institute and partners in New Zealand, Japan, South Korea, Fiji, Vietnam, Thailand and the Philippines to share preventative technologies to address

asbestos-related diseases (\$150,000)

- The Burnet Institute with partners in Kiribati, Papua New Guinea and Solomon Islands to develop systems for the surveillance of antimicrobial resistance across the Pacific (\$127,240)
- Curtin University with partners in Vietnam and Japan to research selective solvent extraction for recycling lithium-based batteries (\$108,000)

See all funded projects in Round 2²¹

The Regional Collaborations Programme aims to strengthen research ties between Australia and the wider Asia-Pacific region. The programme supports greater mobility among our technical and research workforce and enhances links across global science and research networks.

More information on the Regional Collaborations Programme²²



Dr Mohsen Asadnia from Macquarie University leads a project to develop gas sensor arrays to spot explosives—one of 14 projects funded in round two of the Regional Collaborations Programme.

Academy announces successful recipients of the 2019 J G Russell Award

April 12, 2019



Dr Giulia Ghedini from Monash University is one of four 2019 J G Russell Award recipients.

The Australian Academy of Science has announced the successful recipients of its 2019 J G Russell Award.

The award is aimed at financially helping talented younger researchers in the basic sciences as a token of the community's regard for them.

Awardees are chosen from the recipients of the **Australian Research Council Discovery Early Career Researcher Awards**²³.

The award recognises the costs involved in experimental research, and can be used towards the costs of equipment, maintenance, and travel.

The recipients are:

- Dr Giulia Ghedini from Monash University to resolve how entire ecological communities respond to global warming and identify the mechanisms that drive these responses.

²¹ <https://www.minister.industry.gov.au/ministers/karenandrews/media-releases/boosting-science-partnerships-asia-pacific>

²² <https://www.science.org.au/opportunities/travel/grants-and-exchange/regional-collaborations-programme>

²³ <https://www.arc.gov.au/grants/discovery-program/discovery-early-career-researcher-award-decra>

- Dr Yu Heng Lau from the University of Sydney to uncover a new and generalisable platform technology for controlling chemical reactions on the nanoscale, which could benefit the manufacturing industry.
- Dr Tatiana Soares da Costa from La Trobe University to identify novel and smarter herbicide development strategies for effective weed management to sustain our fauna, flora and agricultural industry.
- Dr Qi Wu from the University of Adelaide to develop an Artificial Intelligence (AI) agent that communicates with humans on the basis of visual input and can complete a sequence of actions in environments by combining computer vision (CV), natural language processing (NLP) and reinforcement learning (RL).

The awards are valued at \$6,000 each and are supported by the generosity of the late Miss J Russell. **Find more information about the award here**²⁴.

From giant bees and black holes to unboiling eggs and jellyfish stings

April 30, 2019

The Academy's audience on social media continues to grow, attracted by engaging videos, compelling articles and eye-catching images.

Here are some recent highlights of fantastic science content.



*The rediscovery of the world's biggest bee, *Megachile pluto*, took the internet by storm. The Academy's video was embedded on the Guinness World Records website and reached media as far afield as Brazil, Hungary and the USA.*

<https://youtu.be/rPuhg58PXcs>



To capture the first-ever image of a black hole, astronomers around the world joined forces to create a telescope as large as Earth. The Academy was one of the first to report on this exciting announcement.

<https://youtu.be/r2ioRwseCFQ>



Never mind breakfast, the science behind unboiling an egg has some surprising applications in technology.

<https://youtu.be/qz9utdoXVew>

The Academy's science writers tackled the **laser-sharp physics behind the 2018 Nobel Prize in physics**²⁵ and taught us **all about jellyfish stings**²⁶.

Curious? Keep up-to-date with new science content by:

- **visiting the Curious website**²⁷
- **joining the 1.4 million-strong audience on Facebook**²⁸
- **following the Academy on Twitter**²⁹
- **following the Academy on Instagram**³⁰

Estonian Academy of Sciences aims to support young researchers

April 30, 2019



(From left): Dr TJ Higgins, Professor Tarmo Soomere and Director International Programs Nancy Pritchard.

The President of the Estonian Academy of Sciences, Professor Tarmo Soomere, visited the Academy in April. He met with the Academy's Secretary Biological Sciences, Dr TJ Higgins, and also learnt about the Academy's Early- and Mid-Career Researcher (EMCR) Forum as the Estonian Academy has an interest in supporting young researchers.

While in Australia, Professor Soomere met with Academy President, Professor John Shine and

²⁴ <https://www.science.org.au/opportunities/research-funding/j-g-russell-award>

²⁵ <https://www.science.org.au/curious/technology-future/zap-how-make-really-intense-laser-beam>

²⁶ <https://www.science.org.au/curious/people-medicine/all-about-jellyfish-stings>

²⁷ <https://www.science.org.au/curious/people-medicine/all-about-jellyfish-stings>

²⁸ <https://www.facebook.com/AustralianAcademyofScience/>

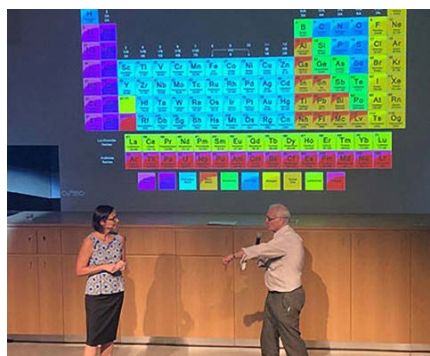
²⁹ https://twitter.com/Science_Academy

³⁰ <https://www.instagram.com/ausacademyofscience/>

with Australia's Chief Scientist and Academy Fellow, Dr Alan Finkel. He also sought information on the Australian Research Council to learn about Australia's research and development, its research priorities and research funding models.

Academy events shine 'after dark' at the World Science Festival Brisbane

April 30, 2019



Dr Nicole Lawrence (University of Queensland, left) and Robyn Williams at the Queensland Museum's After Dark event as part of the World Science Festival Brisbane.

The Academy injected a dose of chemistry into Queensland Museum's After Dark event, part of the World Science Festival Brisbane in March. The sold-out event attracted 600 people to the Queensland Museum for a night of music, interactive science entertainment and expert talks.

The Academy presented a theatre show '10 elements in 10 minutes—or near enough!' featuring ABC science journalist and broadcaster and Academy Fellow Robyn Williams, and Dr Nicole Lawrence from the University of Queensland. The pair delighted the crowd with fun facts about as many elements on the periodic table as possible.

The Academy also ran an interactive 'chemistry of gin' booth in conjunction with the Art of Booze,

a boutique Australian distillery. The booth drew a line-up of guests, with many keen to sample a colour-changing gin infused with butterfly pea flower.

Academy education workshops prove popular

April 30, 2019

In February and March of this year, the Primary Connections professional learning team delivered three fully-subscribed design and technology workshops in Brisbane, Sydney and Melbourne.

Ninety-three primary school teachers across 48 schools from state, catholic and independent sectors attended the workshops.

Primary Connections also partnered with the Victorian Department of Education to deliver professional learning to an additional 20 Victorian primary school teachers.

'Primary Connections: Linking science with literacy' is the Australian Academy of Science's flagship primary school science program. It is an innovative approach to teaching and learning which aims to enhance primary school teachers' confidence and competence for teaching science.

Teachers develop their pedagogical knowledge and explore how to effectively use, adapt and extend the Primary Connections curriculum units to suit their students' needs.

Feedback demonstrates that teachers find these workshops highly informative, providing practical strategies to enhance science, technology, engineering and mathematics (STEM) teaching and learning in their classrooms.

'As a school, we would like to pass on our thanks for such a wonderful workshop! All of our teachers commented on how informative the day was and have discussed how they would be able to implement this learning back at school.'

– Classroom teacher, Brisbane

'The workshop was fantastic. It helped deepen my understanding of what STEM can look like in the classroom and reinforced how much fun STEM is!'

– Classroom teacher, Sydney

'Today's workshop... was well paced and the mix of information and hands on learning balanced the day out well. The presenters engaged directly with all the participants, taking a genuine interest in their responses, acknowledging shared ideas, encouraging and very evidently enthusiastic about their role as educators.'

– Classroom teacher, Melbourne



Transforming sleep with 'electronic skin' sensors

April 30, 2019



Photo: Mark Dadswell

It is tricky to make metal-containing electronics stretch and flex like skin—but it is a challenge that Professor Madhu Bhaskaran from RMIT University has taken on with gusto.

At the Shine Dome on the evening of 16 April, Professor Bhaskaran shared her work as part of the second instalment of Changing Lives with Science, the Academy's 2019 Canberra speaker series presented in partnership with the University of Canberra.

Professor Bhaskaran was joined by Sleptite CEO Cameron van den Dungen to discuss the applications of 'electronic skin' sensors in the aged care sector.

The pair, who work together to bring Professor Bhaskaran's innovations from the lab into real life, kindled insightful discussions about the development of this new technology and the science of getting a good night's sleep.

Join the Academy for the next instalment of Changing Lives with Science on 18 June, where Distinguished Professor Mary-Anne Williams (UTS) and Dr Naseem

Ahmadpour (University of Sydney) will present 'The robots will see you now: how AI and VR are changing lives'.

More information on the Changing Lives with Science speaker series³¹



Watch 'Changing lives with science - speaker series' Curious video: <https://youtu.be/7XHG9GCLUr4>

Academy's education team represented at STEMEd conference

April 30, 2019

Representatives from the Australian Academy of Science's Education team attended the STEMEd: Future ImpACT Conference 2019 in April.

The conference allowed ACT P–12 classroom teachers and school leaders to learn about leading practice in science, technology, engineering and mathematics (STEM) education and innovative futures learning.

The Academy's education team facilitated workshops on Primary Connections and reSolve, two of the Academy's flagship education programs. They also managed an exhibition stand about the Academy's work in STEM education.

Academy Fellow and Chair of the Education Committee to Council, Emeritus Professor Ian Chubb,

presented the opening conference keynote, sharing his perspectives based on a lifetime involved in science and education, including as Australia's Chief Scientist 2011–16.

In his address, Professor Chubb noted our collective future will be heavily dependent on STEM. He identified two critical roles for education: to support students to build capacity to pursue their scientific dreams, and to ensure that all students know enough about STEM to make good judgements and decisions in our increasingly unpredictable future.

The Academy currently operates three education programs spanning primary and secondary science and mathematics.

More information on the Academy's education programs³²



Claudette Bateup (left) and Nicola Dziadkiewicz, Australian Academy of Science Education team members.

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

32 <https://www.science.org.au/education/academy-education>



From the archives: the Academy's coat of arms

April 30, 2019

A coat of arms is a visual representation of identity that has existed since Medieval times. So, what does the Academy's coat of arms represent?

The seven-pointed silver star represents the Commonwealth of Australia.

The Shine Dome is a throwback to the ancient practice of including a picture of your own castle on your coat of arms or herald.

The royal crown is included by special permission of The Queen, who presented the Academy with its Royal Charter in 1954.

The biological sciences are represented by the black swan, which is a unique Australian animal with a long history as a distinctive motif of the great southern land, in contrast to the white swans of the northern hemisphere. (In fact, Europeans once considered black swans more unlikely to exist than unicorns and dragons.)

The physical sciences are represented by the classic motif of an atom's nucleus orbited by three particles, located on the swan's wing.

On the left side, the kangaroo is taken from the Australian coat of arms.

The dog depicted on the right side is a type of hunting dog called a Talbot. This comes from the coat of arms of the Royal Society of London. It was used with special permission of the Council of the Society to signify the two organisations' close relations, as well as the fact that the founding Academy Fellows were Fellows of the Royal Society resident in Australia.



The patent, presented in 1965, officially grants and assigns the coat of arms to the Academy.

Opportunities for scientists—April 2019

April 30, 2019

Academy opportunities

Honorific awards

Nominations are now open for the 2020 honorific awards, including career, mid-career and early-career awards.

Nominations close 1 May 2019.

See all honorific awards³³

Research awards

The Academy supports awards for research. Close to \$270 000 will be offered by the Academy in 2019 to support research in:

- natural science
- medical science
- endangered Australian native vertebrate animals
- environmental science
- history of science
- marine, soil and plant biology.

Applications open now and will close 1 June 2019.

See all research awards³⁴

Research conferences

The Academy supports research through the sponsorship of conferences that focus on rapidly developing fields of research. Applications close 1 June 2019.

Research conference support includes:

- the Boden Research Conference in the biological sciences
- the Elizabeth and Frederick White Research Conference in the physical sciences
- the Fenner Conference on the Environment.

See all research conferences³⁵

Download the 2020 Academy Awards fact sheet³⁶

33 <https://www.science.org.au/opportunities-scientists/recognition/honorific-awards>

34 <https://www.science.org.au/opportunities/research-funding>

35 <https://www.science.org.au/opportunities/conference-and-lecture-funding>

36 <https://www.science.org.au/files/userfiles/opportunities/documents/2020-academy-awards-flyer.pdf>

External opportunities

Florey Medal 2019

The 2019 CSL Florey Medal will be awarded to an Australian biomedical researcher for lifetime career achievements in biomedical science and/or human health advancement for research conducted primarily in Australia—\$50,000

Nominations close 28 June 2019

More information on the CSL Florey Medal 2019³⁷

2020 Australian of the Year Awards

Celebrates the contributions of 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 Awards³⁸

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 Prize³⁹

See more external awards and prizes⁴⁰

Fellows update— April 2019

April 30, 2019

Honours and awards to Fellows

Professor Akshay Venkatesh

FAA FRS—elected a Fellow of the Royal Society

Obituary

Professor Scott Sloan AO FAA

FREng FRS FTSE

2 July 1954 to 23 April 2019

Professor Scott Sloan was elected to the Academy in 2007 for his fundamental contributions to computational geomechanics. He was the key architect of new numerical methods which enable engineers to predict the maximum load capacity of general types of geostructures (such as tunnels, dams, highways and foundations). His models and charts have been used in designs for the London Underground, Italian railways and million-dollar offshore oil and gas platforms. Professor Sloan also derived important new algorithms for implementing complex soil models, solving nonlinear finite element equations, generating finite element grids and solving large systems of sparse equations.

Professor Sloan was Laureate Professor of Civil Engineering at the University of Newcastle and Founding Director of the ARC Centre of Excellence for Geotechnical Science and Engineering. He was also a Visiting

Professor at several national and international universities.

Since his election, Professor Sloan generously gave his time to the Academy. He served as a Member of sectional committees, the National Committee for Mechanical and Engineering Sciences and the Academy's Europe Exchange Committee. In 2016 Professor Sloan was elected to the Academy's Council and was due to finish his three-year term at the end of May this year.

In 2015, Professor Sloan was elected to the Royal Society, elected as an International Fellow of the Royal Academy of Engineering (UK) and was the NSW Scientist of the Year. In 2018 Professor Sloan was made an Officer in the Order of Australia (AO) 'for his distinguished service to education, particularly in the field of geotechnical engineering, as an academic and researcher, to professional organisations and as a mentor to young scientists'.



Professor Scott Sloan.

37 <http://www.aips.net.au/media-releases/2019-csl-florey-medal-nomination/>

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

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

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