



INFLUENTIAL VOICE

Sustainability the focus of Future Earth Australia



Future Earth will take a uniquely holistic approach to address some of humanity's most complex problems. Photo: Jeremy Bishop, Unsplash

The Future Earth program, which brings together thousands of researchers and billions of dollars of sustainability research from across the world, was launched in Australia in November.

The Academy is establishing an Australasian node of the global program to ensure that Australia and its neighbours can realise the full benefits of the sustainability work that's being undertaken across the globe.

The Academy has appointed Dr Imran Ahmad to lead the program following support from CSIRO, the University of Queensland, Macquarie University and the University of Sydney.

Future Earth will take a uniquely holistic approach to address some of humanity's most complex problems, such as climate change, food security and water supply, by integrating physical sciences with the social sciences and humanities.

An example of how this would work would be Future Earth Australia tackling the challenge of sustainable urban and agricultural development in areas with reduced rainfall by bringing together experts from diverse fields such as agricultural science, urban planning, behavioural economics and history.

The launch of Future Earth Australia follows an initial 18-month consultation and planning process involving each of Australia's learned academies that was funded by the Australian Council of Learned Academies (ACOLA).

More information on Future Earth Australia: <http://www.futureearth.org.au/>

Academy welcomes new ARC centres of excellence



Professor Andrew Pitman, Professor Lisa Kewley, Professor Andrew White, Professor Michelle Simmons and Professor Paul Mulvaney

The Academy welcomes the announcement by the Australian Research Council (ARC) of nine new centres of excellence .

More than \$280 million in funding has been awarded to nine centres around the country, to develop Australia's research excellence through highly innovative and collaborative research. ARC centres of excellence are typically funded for up to seven years.

The scheme is also designed to build Australia's human capacity in a range of research areas, including the humanities and social sciences.

The Academy congratulates the following Fellows and National Committee (NC) Members who will be involved in leading the Centres around Australia:

- Professor Lisa Kewley FAA, Chair of NC Astronomy, will head up the ARC Centre of Excellence for All Sky Astrophysics in 3 Dimensions.
- Professor Andrew Pitman, member of the NC Data in Science and NC Earth Systems Science, will lead the ARC Centre of Excellence for Climate Extremes.
- Professor Andrew White FAA, will lead the ARC Centre of Excellence for Engineered Quantum Systems.
- Professor Paul Mulvaney FAA, Chair of NC Chemistry, will lead the ARC Centre of Excellence in Exciton Science.
- Professor Michelle Simmons FAA, a former Chair of NC Physics, will head up the ARC Centre of Excellence for Quantum Computation and Communication Technology.

The other new centres will cover biodiversity and heritage, low-energy electronics technologies, gravitational wave discovery, and ageing research.

Read the ARC centres of excellence media release (<http://www.arc.gov.au/news-media/media-releases/2835-million-awarded-nine-arc-centres-excellence>) and fact sheet (<http://www.arc.gov.au/fact-sheet-centres-excellence>).

Government commits to act on research training review

The Australian Government has accepted all six of the recommendations put forward by the Australian Council of Learned Academies (ACOLA) in its review on Australia's research training system (<http://acola.org.au/index.php/projects/securing-australia-s-future/saf13-rts-review>).

Implementation of the recommendations will put Australia's research training system in a strong position to meet the country's research needs in the 21st century.



Australia's research training system will be in a strong position to meet the country's research needs. Photo: Francisco Osorio/Flickr

Among other recommendations, the review's final report called for the establishment of a working group to oversee a process of reform that would ensure Australian PhD and masters by research graduates have consistent, world-class training that prepares them for careers in academia and in other sectors of the economy.

The review was undertaken by ACOLA with significant input from the Academy. The project was jointly managed by the Academy and the Australian Academy of Technology and Engineering (ATSE). The Academy acknowledges the work of those involved in the review, including Expert Working Group Chair John McGagh FTSE, Deputy Chair Professor Helene

Marsh FAA FTSE, and members Professor Michael Barber FAA FTSE and Professor Jim McCluskey FAA.

More about the Government's response to the ACOLA review: <http://education.gov.au/review-australia-s-research-training-system>

EXCELLENCE IN SCIENCE

Professor Ian Chubb awarded Academy Medal



Professor Ian Chubb surrounded by distinguished guests at the awarding of the Academy Medal.

The prestigious Academy Medal—recognising outstanding contributions to science by means other than through scientific research—was awarded to Australia's former Chief Scientist, Professor Ian Chubb AC, in November.

The event at the Academy's Ian Potter House was attended by leading members of the science community to celebrate Professor Chubb's outstanding contributions to science.

This year Academy Fellows elected Professor Chubb to join a distinguished list of past awardees including famous broadcasters, philanthropists and science communicators.

Professor Chubb's illustrious career championing science—notably as Australia's Chief Scientist, Vice Chancellor of the Australian National University, and president of the International Alliance of Research Universities—has provided opportunities for Australian scientists and researchers to flourish.

More about the award to Professor Chubb: <https://www.science.org.au/academy-medal-announced>

More about the Academy Medal: <https://www.science.org.au/academy-medal>

2017 Academy awards recognise leading scientists

The Academy has announced the recipients of its 2017 awards, including 17 honorific awards (<https://www.science.org.au/opportunities-scientists/recognition/honorific-awards/honorific-awardees/2017-awardees>) across microbiology, applied mathematics, earth science, materials engineering, astronomy, chemistry, evolutionary biology, fluid dynamics and more.

Professor Barry Ninham AO FAA of the Australian National University has been awarded the Academy's most prestigious award for physical sciences, the Matthew Flinders Medal. He is recognised for his work in the self-assembly of biological molecules and in the theory of molecular forces—which most recently led to a cheaper and more efficient method of water purification that has the potential to increase living standards for millions of people and save thousands of lives.

Others recognised also include Professor Joss Bland-Hawthorn FAA, awarded the Thomas Ranken Lyle Medal for his work including the establishment of the fields of galactic archaeology and astrophotonics; Dr Joanne Whittaker, recipient of the Dorothy Hill Award for her work in understanding how the seafloor and ocean basins are formed and evolve through the movements of tectonic plates and the earth's mantle; and Associate Professor Kathryn Holt, named the Gottschalk Medallist for her work on the evolution of pathogens which has led to better understanding of disease transmission, control, and responses to antibiotics and vaccine-induced immunity.

Many of the awards will be formally presented in May at the Academy's annual event, Science at the Shine Dome (<https://www.science.org.au/news-and-events/events/science-shine-dome>).

In addition to its honorific awards, the Academy has also announced a number of research (<https://www.science.org.au/opportunities/research-funding>), travel (<https://www.science.org.au/opportunities/travel>) and conference (<https://www.science.org.au/opportunities/conference-lecture-funding>) awards, generously funded with the support of donors. In 2017 these will, among other things, enable scientists to carry out new research to help the survival of some of Australia's endangered species, give public lectures on subjects such as using ultrafast laser-based terahertz spectroscopy to detect defects in space shuttle insulating foam, and organise cutting edge research run conferences on subjects such as on the sensitivity of the Antarctic ice sheet to marine climate change.



Professor Joss Bland-Hawthorn (top) and Associate Professor Kathryn Holt, two of the recipients of the 2017 Academy honorific awards.

XFELS focus of Lloyd Rees Lecture

The 2016 Lloyd Rees Lecture, 'X-ray lasers: the new wave in diffraction', was delivered by Professor Keith Nugent FAA in Melbourne in October.

Professor Nugent began his lecture with an overview of the physics underpinning X-ray Free-Electron Lasers (XFELS) and of the various XFELS now operating or under construction in a number of countries around the world. XFELS are based on linear accelerator technology and are able to produce femtosecond pulses of X-rays that can be up to ten orders of magnitude brighter than the pulses from facilities such as the Australian Synchrotron. Professor Nugent reported the results of some of the first experiments which use XFELS for X-ray coherent diffraction imaging and progress towards the important goal of imaging single biomolecules.



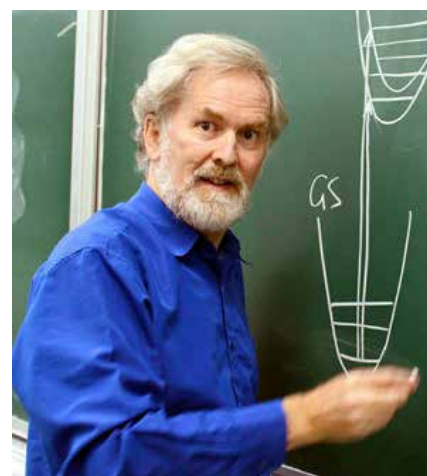
At the lecture were, from left, Professor Tony Klein AM FAA (Victorian Branch Convenor), Mrs Aroia Barone-Nugent (speaker's wife), Professor Keith Nugent FAA (speaker), and Professor Peter Hannaford FAA.

Photo: courtesy of Peter Hannaford

This lecture was the 13th in the series of biennial lectures to commemorate the life and work of Dr Lloyd Rees FAA, foundation Chief of the CSIRO Section (later Division) of Chemical Physics from 1947 to 1978. The Rees Lectures are presented by scientists who have made distinguished contributions to chemical physics in Australia.

Professor Reimers delivers David Craig lectures across Australia

The 2016 recipient of the David Craig Medal and Lecture, Professor Jeffrey Reimers FAA, presented the first of his series of lectures in May. The subject of his series is 'Basic chemical theory is critical to understanding nanoparticle synthesis, 2D nanostructures, and photosynthetic function'. Professor Reimers has so far presented at 23 Australian universities with a further three to come. In addition, an article describing the material presented in the lectures will be published in 'The Australian Journal of Chemistry'. The article reviews some of the key scientific achievements of Professor Craig and expresses them in the context of Professor Reimers research career.



Professor Jeffrey Reimers

Professor Craig performed the first calculations of electronic molecular spectroscopy, explaining the spectra of many simple molecules including benzene. Professor Reimers describes the application of these techniques to the spectra of chlorophyll, ending a 50 year quest. Professor Reimers also explains how the work of Professor Craig is related to that of Professor Noel Hush AO FAA FRS, and how these ideas can be used to understand the nanotechnology molecules synthesised by Professor Maxwell Crossley FAA. The lectures finish with novel understanding of gold nanoparticle synthesis.

The David Craig Medal and Lecture (<https://www.science.org.au/opportunities-scientists/recognition/honoric-awards/career-awards/david-craig-medal-and-lecture>) is made in honour of the outstanding contribution to chemical research of the late Emeritus Professor David Craig AO FAA FRS. It recognises contributions of a high order to any branch of chemistry by active researchers.

The 2017 David Craig Medal recipient is Professor David St Clair Black AO FAA (<https://www.science.org.au/opportunities-scientists/recognition/honoric-awards/honoric-awardees/2017-awardees#craig>). Nominations for the next round will open in early 2017.

Boden research conference builds cross-disciplinary understanding



Scientists at this year's Boden research conference were encouraged to think more fundamentally about their connections to the broader community of scientists. Photo supplied courtesy of Benjamin Winter

The 2016 Boden research conference, Animal Vegetal Mineral (<https://www.science.org.au/news-and-events/events/animal-vegetal-mineral-boden>), was held in Yallingup in Western Australia in September. The conference's main aim was to encourage open and broad discussions between biologists, physicists, mathematicians, chemists and materials scientists. The idea was to explore the links between the biological and the natural sciences, and draw out both the common features of living and dead systems and their essential differences. Key researchers

came from areas including plant photosynthesis, animal coloration and vision studies, active granular matter, geometry and visualisation, liquid crystals, biomineralisation, intermolecular forces, peptide materials and proteomics, and origami and kirigami (shapes and structures).

The aim among the approximately 80 scientists who attended was to explore what delegates did not know, rather than what they did know.

The conference was considered a bold and successful attempt to encourage scientists from Australia, Europe, Asia and the Americas to think more fundamentally about their connections to the broader community of scientists; to look 'over the fence' at the details that divide life from natural scientists, and mathematicians from lab- and field-based researchers.

More information on the Boden research conferences: <https://www.science.org.au/opportunities/conference-lecture-funding/boden-research-conferences>

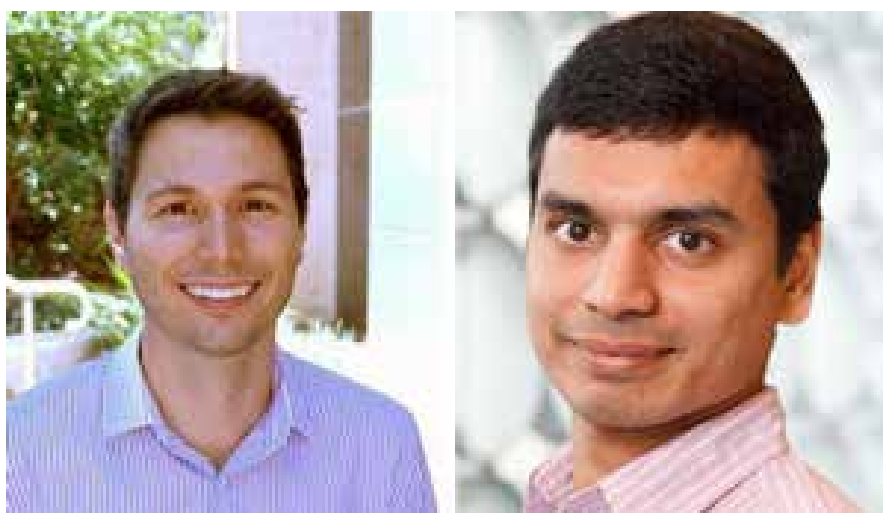
Leadership skills under the spotlight at Science Pathways

The EMCR Forum—the national voice of Australia's early- and mid-career researchers—held its national meeting, Science Pathways 2016: Future leaders, in Sydney in September.

The event brought together EMCRs and scientific leaders from academia, industry and government to explore what leadership in science means, and how to develop skills to become an effective leader.

The event was a great success, receiving positive feedback from participants and speakers. The event also increased awareness of the EMCR Forum with 83% of participants now intending to join the Forum. The full report on the event will be available soon on the Academy's website.

Supporters of Science Pathways 2016: <https://www.science.org.au/academy-newsletter/dec-2016-106/philanthropy#pathways>



Dr Michael Crichton and Associate Professor Sharath Sriram, Co-Convenors of Future Leaders

“*The discussion and enthusiasm for driving change, and having a group voice. It is exciting to think how this group may be able to drive change within the scientific community. Meeting so many people in the same career stage as me, facing the same challenges, makes you feel less alone. And just the real sense of excitement and energy about the whole thing.*” –
Science Pathways 2016 delegate

EMCRs explore the frontiers of microbiome research

The 2016 Theo Murphy Australian Frontiers of Science symposium brought 70 outstanding EMCRs from around the country to Adelaide to discuss the impact of microbes on us and the world around us. The Microbiome: Exploring the role of microorganisms in health and ecosystem processes (<https://www.science.org.au/news-and-events/events/microbiome-exploring-role-microorganisms-ecosystem-processes-and-health>), was an interdisciplinary conference which provided delegates with the opportunity to meet and form collaborations with colleagues who they may not normally encounter.



70 EMCRs converged on Adelaide to explore the role of microorganisms in health and ecosystem processes



Dr Kristin Alford, Director of Science Creativity Education Studio, presenting the dinner address at the symposium.

The delegates were taken on a journey from Antarctica to coral reefs and back again, from the intestine to the skin in humans and animals, and back in time to look at the diet of the Neanderthals. They shared insights on the tools they have in common, exchanged tips for career success, discussed gender equity and explored how EMCRs can support each other in this part of their research journey.

There was great enthusiasm from all delegates to stay connected and continue to find ways to work together. The symposium was funded by the Theo Murphy (Australia) Fund through the Royal Society of London.

EMCR Forum news

Starting the conversation between academia and industry

The EMCR Forum has published a discussion paper that aims to stimulate conversations between people in academia, industry and other sectors carrying out research. Starting the conversation between academia and industry will not only allow for greater engagement, but will ultimately lead to more fluid career paths for researchers across these sectors.

The discussion paper has been constructed for further development as a best practice guide for researchers looking to engage across sectors. If you would like to get involved or contribute please email the EMCR Forum: emcr@science.org.au

Membership drive and new web pages

We would like to invite you to encourage EMCRs to join the EMCR Forum. The EMCR Forum's web pages (<https://www.science.org.au/supporting-science/early-and-mid-career-researchers-0>) have recently been updated to allow easier access to events, opportunities and resources. If you or any of your colleagues are interested in joining, now is a great time to become a member—see all the benefits. Joining is free and open to all researchers within 15 years of receiving their PhD excluding career breaks.

Already a member? Feel free to fill in our new membership form to update your details. The new form will help us better understand the composition of the Australian EMCR community and allow the EMCR Forum to target advocacy and events more effectively.

2017 Theo Murphy Think Tank and Frontiers of Science events

We have two exciting and highly relevant events—as always—planned for next year. The Theo Murphy High Flyers Think Tank will focus on nutrition and be held in Perth on 26-28 July. The Theo Murphy Australian Frontiers of Science will be on Antarctic science and will be held on 13-15 September in Hobart.

These highly-regarded annual events bring together early- and mid- career researchers and experts in their fields to identify potential opportunities for future research collaborations and to propose innovative solutions for nationally significant sciences.

Calls for applications will be made early next year for both events.



Next year's Theo Murphy High Flyers Think Tank will focus on nutrition. Photo: Ali Inay, Unsplash

Accolades for EMCR Forum executive members

Several members of the EMCR Forum executive committee have recently been recognised for their achievements in research.

Sharath Sriram: 3M Eureka Prize

Associate Professor Sharath Sriram was awarded the 2016 3M Eureka Prize for Emerging Leader in Science for the creation of an electronic multi-state memory cell which can mimic the way the human brain processes information.

Dr Elizabeth New: NSW Premier's Prize

Dr Elizabeth New was awarded the NSW Premier's Early Career Researcher of the Year award for her research on diseases of ageing. Her team has developed medical sensors which indicate the location of oxidative stress experienced by the body from diseases such as Alzheimer's. The sensors have been found to be applicable across many other fields of medical research and two sensors have been commercialised so far.

Dr Drew Evans: Future Fellowship

Dr Drew Evans was recently awarded \$375,000 from the Australian Research Council Future Fellowships scheme for his research into microdiffraction capabilities for mineral and corrosion analysis, and for his team to continue research into materials, polymers and thin films.

2017 EMCR Forum executive announced

The Academy's Early- and Mid-Career Researcher (EMCR) Forum has announced changes to its executive team for 2017. The new team includes Dr Carly Rosewarne as committee chair, with Dr Nikola Bowden, this year's chair, stepping into a supporting role as deputy chair and Dr Adrian Carter remaining as the second deputy chair. Three new members, selected from 35 applicants, will join the executive.

Executive leadership

Dr Carly Rosewarne joined the EMCR Forum Executive this year. She is a Research Scientist at CSIRO Food and Nutrition in Adelaide, researching the characterising role of microbes in promoting human gut health. Carly is a passionate advocate for gender diversity in science and is seeking to encourage more female EMCRs to act as mentors, with the aim of enabling younger women coming through the system to reach their full potential.

Dr Nikola Bowden has been a member of the EMCR Forum Executive since 2014 and served as the Chair in 2016. Nikola leads a team of researchers investigating DNA repair triggered by sunlight and chemotherapy in melanoma at the Hunter Medical Research Institute in Newcastle.

Dr Adrian Carter joined the EMCR Forum Executive in 2015 and was deputy chair this year. His research examines the impact that neuroscience has on understanding and treating addiction and other compulsive behaviours. He is based at Monash University.

New members joining in 2017

Dr Amber Beavis was an inaugural winner of ABC Radio National-UNSW's 'Top 5 under 40' Scientists in residence program which she used to showcase the research field of taxonomy, her specialty being arachnids. She currently works as a senior research officer for the Office of Australia's Chief Scientist and is also a visiting Fellow at the Centre for the Public Awareness of Science at the Australian National University.

Dr Róisín McMahon, is passionate about characterising and targeting the virulence proteins that bacteria use to cause disease, in order to develop new antimicrobial drugs for life-threatening infections. She has been coordinator of the Brisbane node of the HealthHack, a weekend hackathon designed to provide solutions to patients, clinicians, and biomedical researchers. She currently works at the Institute for Molecular Bioscience at the University of Queensland.

Dr Jackson Thomas' research is unravelling novel treatment options in the field of skin disease. He was an ACT Young Tall Poppy in 2015 and is an active contributor to the Australian Society for Medical Research. He is based at the Health Research Institute at the University of Canberra

Update from the National Committees for Science

Major international Antarctic conference to be held in Tasmania in 2020

The National Committee for Antarctic Research led the successful bid for the 2020 Scientific Committee for Antarctic Research (SCAR) (<https://www.science.org.au/news-and-events/news-and-media-releases/tasmania-host-key-antarctic-meetings-2020>), in partnership with the Tasmanian Government and the Australian Antarctic Division. More than 700 Antarctic scientists and academics from over 40 countries are expected to attend the SCAR events, providing a significant boost to the Tasmanian economy and showcasing the state as a key Antarctic hub. As a result of the successful bid, Council Managers of National Antarctic Programs (COMNAP) will also host its annual general meeting in Hobart, with more than 100 Antarctic program managers and operational experts to attend.



*Tasmania is to host an international conference on the Antarctic in 2020.
Photo: MemoryCatcher/Pixabay*

Australian elected President of SCAR

In addition to the successful bid for the 2020 SCAR conference, the Chair of the National Committee for Antarctic Research, Professor Steven Chown of Monash University, has been elected President of SCAR. Professor Chown is the first Australian President of SCAR, and his tenure will conclude with the 2020 meeting.

National Committee to raise profile of history and philosophy of science

The National Committee for History and Philosophy of Science (<https://www.science.org.au/supporting-science/national-committees-science/national-committee-history-and-philosophy-science>) is the Academy's link to the International Union of History and Philosophy of Science and Technology (<http://iuhps.net/>). The committee is chaired by Professor Joan Leach.

The committee seeks to shape the future directions for science and innovation in Australia by learning from history and philosophy. It is actively involved with the Academy's journal, *Historical Records of Australian Science* (<http://www.publish.csiro.au/hr>), and assists with the Mike Smith Student Essay Prize (<https://www.science.org.au/opportunities/research-funding/mike-smith-student-prize-history-australian-science-or-australian>) of \$3000, which this year received a record number of applications.

The committee is also planning several public events for next year. 'Emerging issues in science and society' will pair early-career history and philosophy of science researchers with scientists for a series of public presentations or debates.

Committee driving strategy for information and communication sciences, engineering and technology

The National Committee for Information and Communication Sciences (<https://www.science.org.au/supporting-science/national-committees-science/national-committee-information-and-communication>) is chaired by Professor Rod Tucker FAA. The committee is currently working towards creating a National Strategy for Information and Communication Sciences, Engineering and Technology (<https://www.science.org.au/support/analysis/decadal-plans/ics>). This planning process has been initiated by the Academy along with the Australian Academy of Technology and Engineering (ATSE) to address an urgent need for a high-level national strategy to guide the development of information and communication sciences, engineering and technology capabilities into the future.



The Academy is supporting the development of a National Strategy for Information and Communication Sciences, Engineering and Technology. Photo: FirmBee/Pixabay

The committee held a roundtable discussion in October, bringing together stakeholders from relevant fields including education and technology. The two academies will now work with selected partners to consult broadly with industry, community and academic stakeholders in the development of this strategy, then with government and relevant sector stakeholders to ensure a process for implementation and periodic review of progress into the early 2020s.

Honours and awards to Fellows



Professor Rick Shine, Professor Min Gu, Professor David James, Professor Jamie Rossjohn and Professor Toby Walsh

The Academy congratulates the following Fellows for their achievements.

Professor Rick Shine AM FAA—2016 Prime Minister's Prize for Science and the 2016 NSW Scientist of the Year.

Professor Joss Bland-Hawthorn FAA—2016 NSW Premier's Prize for Excellence in Mathematics, Earth Sciences, Chemistry and Physics

Professor Mike Archer AM FAA—2016 NSW Premier's Prize for Excellence in Biological Sciences (Ecology, environmental, agricultural, organismal)

Professor David James FAA—2016 NSW Premier's Prize for Excellence in Medical Biological Sciences (Cell and molecular, medical, veterinary and genetics)

Professor Toby Walsh FAA—2016 NSW Premier's Prize for Excellence in Engineering and Information and Communications Technologies

Professor Jim McCluskey FAA and Professor Jamie Rossjohn FAA—shared the 2016 Victoria Prize for Life Sciences

Professor Min Gu—2016 Victoria Prize for Physical Sciences

Professor Michelle Simmons FAA FTSE—L'oreal–UNESCO Asia–Pacific Woman in Science for 2017

Robyn Williams AM FAA—Australian Geographic Society's Lifetime of Conservation Award

Fellows in the news

Professor Rick Shine AM FAA was named the winner of the 2016 Prime Minister's Prize for Science for his renowned work on reptile evolution and conservation.

Professor Michelle Simmons FAA FTSE was named the Asia–Pacific's 2017 L'Oreal-UNESCO Laureate in the Physical Sciences for her work in quantum and atomic electronics, while Robyn Williams AM FAA was presented with the National Geographic Society's 2016 Lifetime of Conservation Award for his decades of promoting science as a broadcaster and science communicator.

Professor Michael Archer AM FAA and Professor Terry Hughes FAA were inducted as Bragg Members, the highest category of membership awarded by the Royal Institution of Australia.

Professor Peter Doherty AC FAA FRS Nobel Laureate celebrated the 20 year anniversary of his Nobel Prize, following a launch of a refreshed version of *The science of immunisation: questions and answers*, a publication addressing concerns held by some members of the public regarding the safety of immunisations.

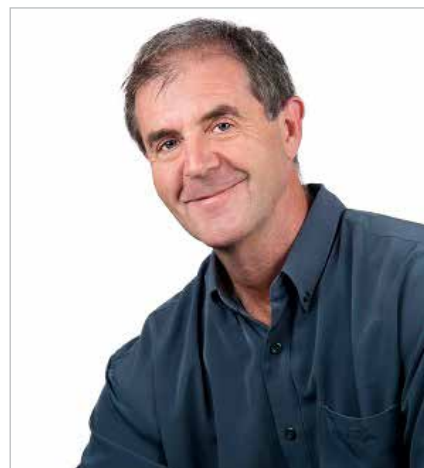
Congratulations also to Catherine Livingstone AO FAA, who was named the new Chair of the Commonwealth Bank and Professor Hugh Durrant-Whyte FAA FRS FTSE, who is the Director of the newly launched Centre for Translational Data Science at the University of Sydney.

In research news, Professor David Craik FAA, head of the Clive and Vera Ramaciotti Facility at the University of Queensland, spoke about his team's work on plants that will serve as 'biofactories' that produce next generation pharmaceuticals. On the other side of the country, Professor Hans Lambers FAA is working to protect a wetlands site near Perth, which is home to a rare carnivorous plant that is being threatened by a proposed development.

Gaining international attention for their research, Professor Scott O'Neill FAA and his team are preparing for an expansion of their work infecting mosquitoes with *Wolbachia* bacterium. The infection stops the insects passing on viruses such as dengue and zika, and trials will begin in South America following 'spectacular' results with mosquito populations in Townsville.

Professor Frank Caruso FAA at the University of Melbourne has developed nanoengineered 'lego-like' building blocks, which could have applications in drug delivery, chemical sensing and energy storage.

Finally, Professor Terry Hughes made science journal *Nature's* ten people who mattered in 2016.



Professor David Craik, one of the many Fellows in the news recently.

Obituaries

Professor John Newton FAA

1924–2016

Professor John Newton was born in 1924 in Birmingham, England. He won a scholarship to St Catharine's College, Cambridge, where he completed the first two years of his bachelor degree (BA, 1944) before joining the war effort in 1943. During WWII Newton worked as a junior scientific officer at the radar facility in Malvern. In 1946, he was able to return to the Cavendish laboratory at Cambridge to finish his MA (1948) and later his PhD (1953).

Newton joined the Atomic Energy Research Establishment (AERE) in Harwell in 1951. He began as a fellow before promotion to principal scientific officer in 1954. Newton then accepted an appointment as senior lecturer (1959–67) and later, reader in physics (1967–70) at the University of Manchester. The first of Newton's visits to the Lawrence Radiation Laboratory (LBL) in Berkeley, USA took place in 1956–58. He made subsequent visits in 1965–67, 1975 and 1980–81.

In 1970, Newton left England and became professor of nuclear physics and head of department at the Australian National University (ANU), Canberra. Newton was instrumental in the installation of a new accelerator at the ANU and introduced a new collaborative research ethos to the department. He was made emeritus professor in 1990 and continued as a visiting fellow in the Department of Nuclear Physics until 2008.

Newton was made a Fellow of the Academy in 1975. In 2010 he was interviewed for the Academy (<https://www.science.org.au/learning/general-audience/history/interviews-australian-scientists/professor-john-newton-nuclear>) by Professor George Dracoulis.



Professor John Newton

Professor Robin Stokes FAA

1918–2016

Robert (Robin) Stokes was born in England in 1918 and moved to New Zealand at age five. Stokes earned a BSc (1938), MSc (1940) and DSc (1949) from the Auckland University College and a PhD (1950) from the University of Cambridge. During the war (1941–45) Stokes worked as a chemist and chief chemist at the Colonial Ammunition Company, New Zealand. He then moved to Australia to take up a position as lecturer in Chemistry at the University of Western Australia. In 1948 Stokes went to the University of Cambridge as an Imperial Chemical Industries fellow. From 1950 to 1955, he was senior lecturer and reader in chemistry at the University of Western Australia. In 1955 Stokes's definitive book 'Electrolyte Solutions', which he co-authored with Professor Robert Robinson, was first published. Also in 1955, he moved to the University of New England in New South Wales as the foundation professor of chemistry, a position which he held until his retirement in 1979. Stokes was made emeritus professor from 1980.



Professor Robin Stokes

Stokes was elected to the Academy in 1957. In 2009 he was interviewed for the Academy (<https://www.science.org.au/learning/general-audience/history/interviews-australian-scientists/professor-robin-stokes-chemist>) by Professor Ken Marsh.

90th birthdays

The Academy congratulates the following Fellows on their 90th birthdays.

Professor David Letham FAA on 8 September

Professor Jim Lance AO CBE FAA on 29 October



*Professor David Letham (left) and
Professor Jim Lance*

INTERNATIONAL ENGAGEMENT

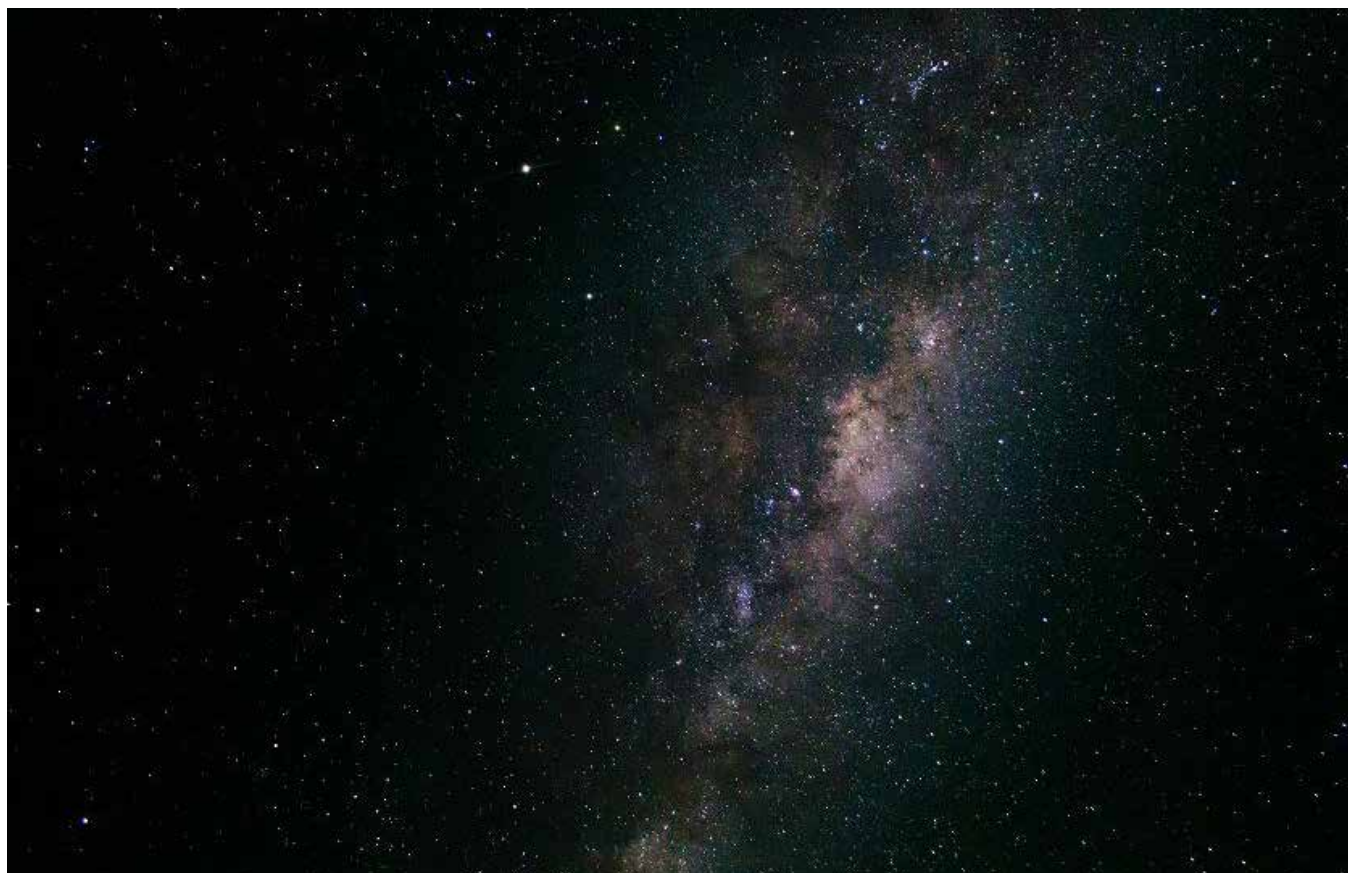
Major space research conference to be held in Sydney in 2020

A major international conference on space research will be held in Sydney in 2020 following a successful bid by a team led by UNSW Canberra and the Academy.

The 43rd Scientific Assembly of the Committee on Space Research (COSPAR) is held every two years, with the 2020 event expected to bring around 3,000 international space experts from more than 50 countries to Australia.

Representatives from major research and educational institutions including CSIRO, Geoscience Australia, the Bureau of Meteorology and the Square Kilometre Array, as well as international agencies, universities and industry, will be in attendance, networking with leaders from around the globe.

The bid leader was Professor Russell Boyce, Director of UNSW Canberra's space program and Chair of the Academy's National Committee for Space and Radio Science (<https://www.science.org.au/supporting-science/national-committees-science/national-committee-space-and-radio-science>). Australia's Chief Scientist Dr Alan Finkel AO FAA FTSE and the Academy's Secretary for the Physical Sciences, Professor Jim Williams AM FAA FTSE, were also involved.



Streaky Bay, South Australia. Photo: Thom Schneider, Unsplash

Academy to manage new Regional Collaborations Programme

New funding to help Australian researchers and businesses collaborate with their counterparts in the Asia–Pacific region (<https://www.science.org.au/news-and-events/news-and-media-releases/australian-and-asia-pacific-researchers-benefit-32-million>) has been announced by the Hon Greg Hunt MP, Minister for Industry, Innovation and Science.

The \$3.2 million Regional Collaborations Programme is administered by the Academy and is funded under the Australian

Government’s National Innovation and Science Agenda’s Global Innovation Strategy. The programme will fund Australian participants from eligible organisations to collaborate with regional and international science, research and innovation partners on solutions to shared regional challenges within the Asia–Pacific.

The Academy encourages Australian research organisations and businesses to apply for funding under the programme (<https://www.science.org.au/opportunities/travel/grants-and-exchange/regional-collaborations-programme>). Applications close 16 January 2017.



*The new programme will help find solutions to regional challenges within the Asia–Pacific.
Photo: Kevin Gill, Flickr*

Winners of Entrepreneurship Challenge travel to Paris



In Paris were (from left) John Rivers; Clarisse Angelier, Head of CIFRE Department, ANRT (National Association for Research and Technology), France; Spencer Richardson; Linda Khong; Stephen Brady AO CVO, Australia’s Ambassador to France; Amanda Vrselja; and Guilhem Frescaline, Chargé de développement au service CIRFE – ANRT, France. Photo courtesy Linda Khong

Four members of the winning team from the inaugural Australian–French Entrepreneurship Challenge, held in June, travelled to Paris in September for a 10-day study tour. They were Linda Khong, Spencer Richardson, John Rivers and Amanda Vrselja.

The tour included visits to The Brain and Spine Institute, the AIRBUS Safran Launchers, the Paris Sciences Lettres University, AGORANOV Incubator, Paris Saclay University, GlobalCare Initiative and attending a dinner and award ceremony for the French Entrepreneurship Challenge. Particular highlights of the trip included a private visit to the Château de Versailles and a meeting with Australia’s Ambassador to France.

Lara Bereza-Malcolm will be travelling to Paris in late January to participate in the Week of International Scientific Young Talents. The sixth team member, Ariel Zeleznikow-Johnston, is currently organising his visit.

Early-career researcher to travel to the US

An early-career researcher from the Faculty of Health at the University of Canberra has been awarded a scholarship to visit the National Institutes of Health in the United States in late 2017.

During her eight-week visit, Hayley Teasdale will work with Dr Mark Hallett at the National Institute of Neurological Disorders and Stroke to undertake training in non-invasive brain stimulation techniques and underlying neurophysiology.

Hayley's visit has been made possible by the Adam J Berry Memorial Fund, established in memory of a young Australian scientist. The fund pays travel expenses for one young Australian scientist each year to work at an NIH institute for up to 13 weeks. In return, they are expected to make a contribution to the research program of the institute they are visiting. The fund is co-managed by the Academy and the Foundation for the National Institutes of Health.

More about this funding opportunity: <https://www.science.org.au/opportunities/travel/grants-and-exchange/visit-national-institutes-health-usa-junior-scientist>



Hayley Teasdale will travel to the US in 2017

Australia represented at Falling Walls Lab in Berlin



Falling Walls Lab 2016: Kim van Netten—Breaking the Wall of Low Grade Metal Resources, from Falling Walls.

The Falling Walls Foundation is a non-profit organisation in Berlin, established in 2009, 20 years after the fall of the Berlin Wall. It asks 'Which are the next walls to fall?' as a result of scientific, technological, economic and sociological breakthroughs.

Each year, the foundation supports scientific organisations around the world to host a Falling Walls Lab to promote interdisciplinary connections between aspiring academics, innovators, entrepreneurs, investors and professionals.

Participants have three minutes to present their research work, business model or initiative to a broad audience from science and industry, including a jury who selects the most innovative and promising idea.

The winner of Australia's first Falling Walls Lab, Dr Kim van Netten (<https://www.science.org.au/news-and-events/news-and-media-releases/winner-first-falling-walls-lab-announced>), represented Australia at the international event in November. The Berlin event was attended by 100 finalists and winners from the 49 international Falling Walls Labs held during the year.

A second representative from Australia, Josh Chu-Tan from the Australian National University, received a wild card entry for the competition by winning the Asia–Pacific Three Minute Thesis competition.

The Australians received support and encouragement while in Berlin from Academy President Professor Andrew Holmes AM PresAA FTSE FRS and Emeritus Professor Hans Bachor AM FAA.

The winner of this year's international event was Dang Huyen Chau from the Technische Universität Dresden for her work on producing fuel logs from used coffee grounds.

The Falling Walls conference, held the day following the lab, involved world experts presenting on topics including slavery, cybersecurity, gravitational waves and sustainable farming.

Inaugural Australia–Indonesia Science Symposium a success



The symposium brought together members of the Australian and Indonesian scientific academies, early- and mid-career researchers, and representatives of government agencies and private sector partners.

An event that brought Australian and Indonesian scientists and other stakeholders together in late November has broadened the opportunities for continuing connections between the two countries.

The inaugural Australia–Indonesia Science Symposium at the Shine Dome in Canberra promoted scientific collaboration between Australia and Indonesia by enhancing scientific cooperation and exchange, and strengthening people-to-people links between the two countries.

The event was organised following a visit in June of a high-level Indonesian delegation led by the President of the Indonesian Academy of Sciences, Professor Sangkot Marzuki.

The symposium themes were health, marine science and climate change, and agriculture. An overarching theme was the uses and transformative potential of big data and other emerging technologies.

The themes were further explored in workshops co-convened by Academy Fellows Dr Jim Peacock AC FAA FTSE FRS, Dr TJ Higgins AO FAA FTSE, Professor Ove Hoegh-Guldberg FAA and Professor David Cooper AO FAA. Together with their Indonesian counterparts, the convenors put together a program which allowed for in-depth exchanges between Australian and Indonesian scientists working on questions of common concern.

As well as members of the Australian and Indonesian scientific academies, the symposium brought together early- and mid-career researchers and representatives of government agencies and private sector partners. In addition to the workshop topics, participants also explored opportunities for government and private sector funding, discussed career pathways in science, and examined the challenges in linking science to policy in both countries.

The symposium was jointly organised by the Academy, the Indonesian Academy of Sciences, the Australian Early- and Mid-Career Researcher Forum, and the Indonesian Young Academy of Science with the support of the Australian Department of Foreign Affairs and Trade and the Knowledge Sector Initiative.

Annual Australia–China Symposium supports collaborations

The 12th Australia–China Symposium between the Academy, the Australian Academy of Technology and Engineering (ATSE), and the Chinese Academy of Sciences (CAS) was focused on advanced materials, with experts from both countries exploring the fundamentals of advanced materials, advanced materials research, and the industrial applications of advanced materials.

The Academy managed the symposium, which was held in China in September.

CAS Vice-President Professor Tieniu Tan welcomed the researchers to the symposium, with Australian keynote presentations delivered by Academy President Professor Andrew Holmes AM PresAA FTSE FRS and the then ATSE President Professor Peter Gray FTSE.

A group of 16 early- and mid-career researchers also attended the event, observing proceedings and presenting posters on their own research.

The purpose of these symposia are to strengthen existing and develop new scientific collaborations between Australian and Chinese researchers, and they have led to the establishment of organisations such as the Australia–China Consortium for Astrophysical Research.

The Australia–China Symposium was supported by the Department of Education and Training and the Department of Industry, Innovation and Science.



This year's Australia–China Symposium focused on advanced materials. Image: Zachary Jean Paradis, Flickr

Argentinian minister visits Academy

The Minister for Science, Technology and Productive Innovation of Argentina, Dr Lino Barañao, led a group representing Argentina in a visit to the Academy in November.

The purpose of the Minister's visit to Australia was to learn more about Australia's research system, and to strengthen the bilateral relationship through exploration of opportunities for research collaboration. Dr Barañao was also interested to learn about the work of the Academy—in particular how it promotes Australia's scientific international engagement.

The group met with Professor John White AO FAA FRS at the Shine Dome.



Academy Fellow Professor John White (centre) presenting a gift to the Argentinian visitors, (from left) Under-Secretary for Policy (Ministry of Science, Technology and Innovation), Dr. Jorge Aguado; Deputy Head of Mission, Embassy of Argentina, Eduardo Acevedo-Diaz; Argentinian Minister for Science, Technology and Productive Innovation, Dr Lino Barañao; and Director for International Cooperation (Ministry of Science, Technology and Innovation), Mariano Jordán.

Academy contributes to new international partnership

The Academy is making significant contributions to a newly established organisation that has brought major global science and health networks closer together.

This year, the world academies of science and medicine—IAP, the global network of science academies; the InterAcademy Council (IAC); and the InterAcademy Medical Panel (IAMP)—established a single umbrella organisation called the InterAcademy Partnership. This will give them greater impact on global issues of common interest. The networks were renamed IAP for Science, IAP for Research and IAP for Health.

Active with the previous academies, the Academy is now a Board member of the IAP for Research and a member of the Executive Committee of the IAP for Science.

The Academy's Director of International Programs and Awards, Ms Nancy Pritchard, attended IAP network meetings in Beijing in September. The meetings discussed the transition of the IAP for Research secretariat from the Royal Netherlands Academy of Arts and Sciences to the US National Academy of Sciences in 2017; fundraising and development matters; and current projects on improving scientific input into policy for the sustainable development goals, and harnessing science, engineering and medicine for Africa. Professor Michael Barber FAA FTSE and Dr TJ Higgins AO FAA FTSE respectively serve on the committees overseeing the latter two projects.

An IAP for Health statement, A call for action to improve reproducibility of biomedical research, and possible topics of future statements were discussed. Four regional groupings of academies are also members of the IAP and each provided an update on their activities and projects in Asia, Africa, Europe and Latin America.



The IAP recently held network meetings in Beijing. Photo: Yolanda Sun, Unsplash

ICSU update

About the International Council for Science (ICSU)

- Latest ICSU Newsletter: <http://www.icsu.org/news-centre/insight/newsletters-2016>
- The Academy's formal links with ICSU: <https://www.science.org.au/supporting-science/international-representation/international-council-science>

Steven Chown elected SCAR President, Hobart to host key 2020 SCAR meetings

Professor Steven Chown (Monash University) was elected President of the Scientific Committee for Antarctic Research (SCAR) until 2020 at the 2016 SCAR Delegates Meeting.

At the same meeting, Hobart was selected to host the 2020 Delegates' Meeting and Open Science Conference (<https://www.science.org.au/news-and-events/news-and-media-releases/tasmania-host-key-antarctic-meetings-2020>). The bid for the meeting and conference was led by the Academy's National Committee for Antarctic Research (<https://www.science.org.au/supporting-science/national-committees-science/national-committee-antarctic-research>) in partnership with the Tasmanian Government and Australian Antarctic Division.



Newly-elected President of SCAR, Professor Steven Chown

Extraordinary General Assembly approves ICSU–ISSC merger in principle

A proposal to merge ICSU with the International Social Science Council (ISSC) was approved in principle at an extraordinary General Assembly in Oslo in October. The councils of the two bodies will establish a transition task force to develop detailed transition plans, which will be put to a vote during a joint meeting of ICSU and ISSC members in October 2017 during the 32nd ICSU General Assembly in Taipei. If endorsed, the transition will be implemented and overseen by the ISSC and ICSU executives, with a founding General Assembly of the new organisation tentatively planned for October 2018.

The executives of both organisations unanimously endorsed the merger following the recommendation of a joint working group on the relationship between the two Councils. A merged body will provide a unified, global voice for social and natural sciences.

More information on the ICSU–ISSC merger: <http://www.icsu.org/general-assembly/extraordinary-general-assembly-oslo-2016/background>

Academy review of ICSU union membership levels

As the Australian adhering body to ICSU, 20 ICSU unions and 11 ICSU interdisciplinary bodies, the Academy is undertaking its regular 10-yearly review of Australia's membership levels of these organisations. The review committee has recommended to the Academy's Executive Committee that all memberships are retained; however, due to increasing membership costs, the Academy will lower membership levels of the highest-cost dues to remain within its budget. These recommendations will come into effect from 2017.

The Academy regrets that Federal support to enable payment of the climate science subscriptions (Future Earth, the World Climate Research Programme and the Scientific Committee on Oceanic Research) was discontinued in 2015 and replacement funding has not been identified. The subscriptions for these bodies will remain in arrears until funding is secured. The review committee is continuing to work with the relevant National Committees for Science and the secretariat to identify possible sources of funding.

The National Committees for Science, which serve as the Academy's links to the international unions and the relevant Australian communities, were consulted throughout the review process. If you have any queries about the review please email the National Committees office: Meaghan.Dzundza@science.org.au.

Academy elected to Executive Board of regional network of science academies

Professor Cheryl Praeger AM FAA has been elected as Member-at-Large to the Executive Board of the Association of Academies and Societies of Sciences in Asia (AASSA) (<http://aassa.asia/>) for a two-year term.

AASSA is made up of 34 science and technological academies and societies throughout Asia and the Pacific region and is one of four regional affiliated networks of the InterAcademy Partnership (IAP) (<http://www.interacademies.org/>). One of the Academy's priorities is to contribute Australian expertise and leadership in regional and global science networks, with election to the Executive Board of AASSA is an important step in achieving this goal.

The Academy has previously been represented on the Executive Board of AASSA by Professor Kurt Lambeck AO FAA FRS and Professor Jenny Graves AO FAA.

SCIENTIFIC LITERACY

Revised immunisation booklet distributed across Australia

Minister for Health the Hon Sussan Ley MP joined the presidents of the Australian Medical Association and the Australian Academy of Science, Nobel Laureate Professor Peter Doherty AC FAA FRS and paediatrician Dr Michael Freeland MP in October to launch *The science of immunisation: Questions and answers* (<https://www.science.org.au/learning/general-audience/science-booklets/science-immunisation>).



Paediatrician and MP Dr Michael Freeland, Professor Peter Doherty, Minister for Health Sussan Ley and AMA President Dr Michael Gannon being interviewed by media at the launch of the immunisation booklet.

In response to renewed concerns around immunisation rates, around 72,000 printed copies of the newly revised and updated booklet that was first published five years ago have been distributed to doctors' offices, clinics and other locations where immunisations are carried out in Australia.

The booklet provides the most up-to-date information from some of Australia's leading researchers in immunology in a simple and impartial way.

Questions answered in booklet are:

1. What is immunisation?
2. What is in a vaccine?
3. Who benefits from vaccines?
4. Are vaccines safe?

5. How are vaccines shown to be safe?
6. What does the future hold for vaccination?

The reprinting and distribution of the booklet is supported by the Australian Government Department of Health.

December issue of Historical Records of Australian Science now online

The December issue of the Academy's journal, *Historical Records of Australian Science* (Volume 27 Number 2 2016) (<http://www.publish.csiro.au/hr>), is now online.

Papers in this issue include 'Glimpses of the Past from Portable Wooden Mineral Cases' and 'Elemental Micro-analysis of Organic Compounds: the Australian Experience'. Memoirs for Robert Bilger, Lloyd Evans, Charles Hurst, Donald Metcalf, Alan Reid and Robert Street are published, along with an interesting book review section and supplementary material.

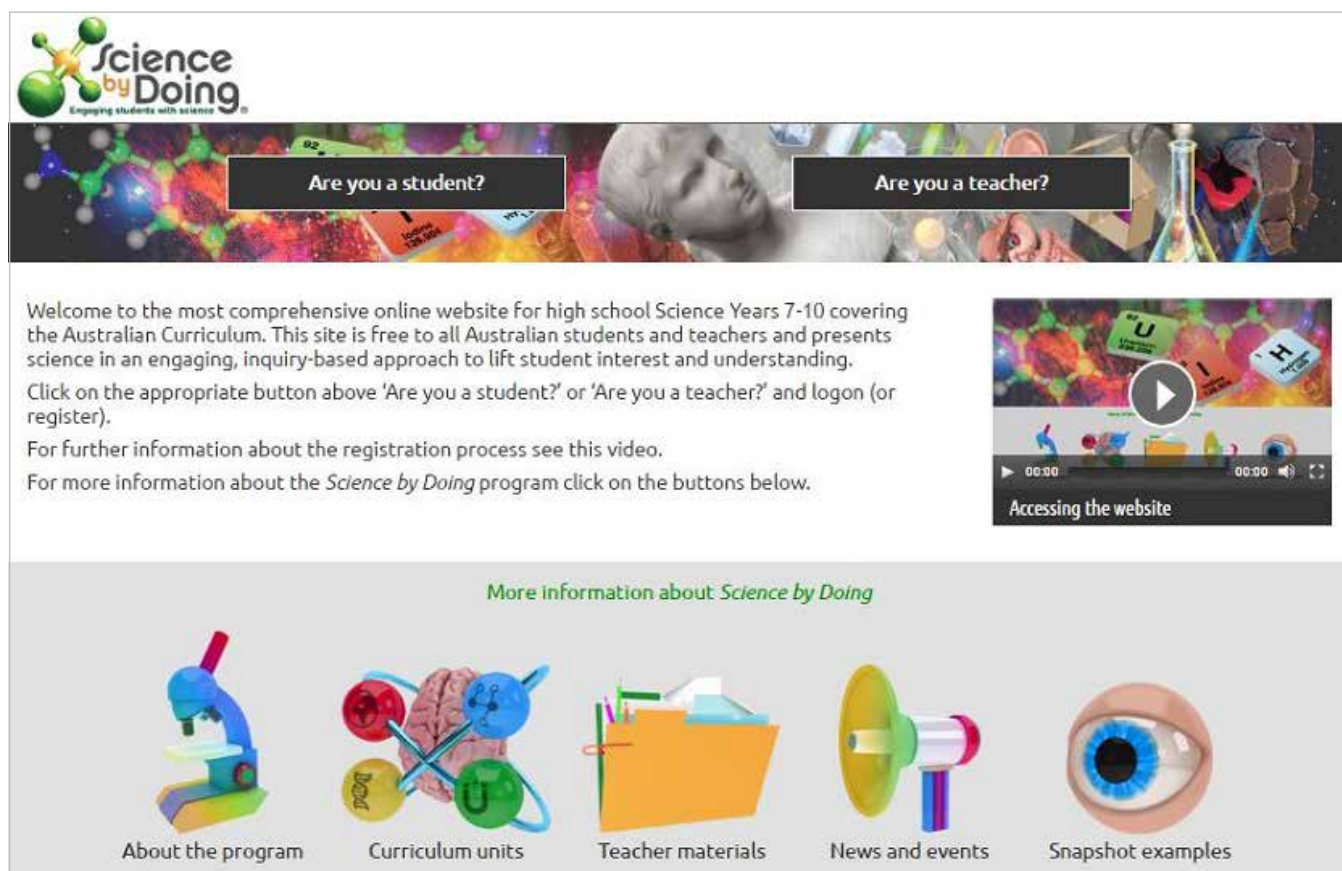
Fellows can access the online journal for free by logging in to the Fellows' section of the Academy website.

Public access to articles is available on a paid basis, and printed copies can be ordered through CSIRO Publishing.

Biographical memoirs (<https://www.science.org.au/fellowship/fellows/biographical-memoirs>) in the journal are published on the Academy's website in due course, where they are available to the public at no cost.

New look for Science by Doing

The Science by Doing website (<https://www.sciencebydoing.edu.au/>) has just had a facelift to capture the latest approaches in web technology.



Science by Doing
Engaging students with science

Are you a student? **Are you a teacher?**

Welcome to the most comprehensive online website for high school Science Years 7-10 covering the Australian Curriculum. This site is free to all Australian students and teachers and presents science in an engaging, inquiry-based approach to lift student interest and understanding. Click on the appropriate button above 'Are you a student?' or 'Are you a teacher?' and logon (or register). For further information about the registration process see this video. For more information about the *Science by Doing* program click on the buttons below.

Accessing the website

More information about Science by Doing

- About the program
- Curriculum units
- Teacher materials
- News and events
- Snapshot examples

Science by Doing has a new look

While many education websites are only available to teachers, Science by Doing is available to all Australian students and teachers simply by registering.

New website visitors can explore many aspects of the Science by Doing program before registering, including some of the program's videos.

Usage comparisons (<http://au.urlm.com/>) with other websites indicate that Science by Doing is the top site for Australian secondary school science teachers and students.

Pre-service primary teachers benefit from workshops



The workshops provide science education for pre-service teachers in a supportive environment.

More than 1,000 pre-service teachers participated in 'Primary Connections Ready' two-day primary science and literacy professional learning workshops this year. The workshops are supported by the Australian Government Department of Education and Training through the Mathematics and Science Participation Program.

One of the workshops, in September, was held for students at the University of Southern Queensland (USQ) in Toowoomba. Laureena Todd, who is currently completing her teaching degree at USQ, brought her four-month-old Aaden along—the youngest ever workshop attendee. Laureena said she would recommend the workshop to other pre-service teachers.

Dr Karen Spence, Senior Lecturer (Science Education) at USQ, said her favourite part of the workshop was seeing pre-service teachers genuinely involved in science education in a supportive and non-competitive environment. She appreciated the fact that Primary Connections was travelling to regional universities.

Primary Connections is planning to more than double the number of pre-service teachers trained in these two-day courses next year.

“ I believe the Primary Connections workshop is an extremely valuable professional learning opportunity. I gained so much information, which extended and transformed my thinking ... Even though Primary Connections focuses on science and connecting to literacy, many of the learning strategies and teaching methods could be applied to any subject across the curriculum. ” *Mary Oliver, USQ distance education student*

Academy events 2017

Life on the loose



Find out how Australia is dealing with introduced species at the Science at the Shine Dome symposium next May

Foxes and fire ants, cane toads and Paterson's curse: Australia is home to a huge range of introduced species. Whether brought in by accident or by design, many plants, animals and diseases are harmful to the environment, to agriculture and to health. How do we monitor them? What do we do to reduce their impact, and is eradication ever possible? And how do we prevent them from coming here in the first place?

At Science at the Shine Dome next May, join international experts to explore how we manage invasion risks; learn the latest science in detecting and controlling introduced species; and hear how the rest of the world is learning from Australia's giant natural experiment as the climate changes and people continent-hop and trade at an ever increasing rate.

The event will also present the work of Australia's leading scientists: new Fellows of the Academy and recipients of Academy awards.

When

23 May—New Fellows seminar

24 May—Academy AGM (Fellows only), awards, Matthew Flinders Medal and Lecture, early- and mid-career researcher workshops

25 May—Life on the loose: species invasion and control

Where

The Australian Academy of Science, the Shine Dome, Gordon St Acton ACT

Register

Register now for Science at the Shine Dome: <https://www.science.org.au/news-and-events/events/science-shine-dome>

Dawn of the new space age

In 2017, journey with the Academy into the depths of space—explore the big bang nearly 14 billion years ago; galaxies far, far away; habitable planets and the potential for alien life; and the strange new things which are challenging the laws of physics, simply by existing. Australian researchers are contributing to the global effort to understand space and the result is some amazing science.

This series of talks in Canberra will bring together a collection of the top minds in space research who want to share their discoveries on the exploration for extraterrestrial life, the hunt for habitable planets, what planets like Jupiter are really made of, how time works in space, how we are continuing to explore the outer reaches of our planet and how we can clean up space junk using lasers.

More about Dawn of the new space age: <https://www.science.org.au/news-and-events/events/public-speaker-series/dawn-new-space-age-0>



IMMORTALITY in Adelaide

In this fifth and final event in the Academy's Life + Death series, three amazing experts will describe how they're all trying to cheat death in their own way—through mapping the code of life to bring back extinct species in the future; by suspending life until technologies exist to cure diseases, bring us back to life and allow us to live as immortals; and much more.

Join the Academy on 16 February as we explore IMMORTALITY in Adelaide.

More about IMMORTALITY in Adelaide: <https://www.science.org.au/news-and-events/events/immortality-adelaide>

OPERATIONAL EXCELLENCE

Philanthropy

Annual Giving Program supports Academy's work

The Academy launched its Annual Giving Program last May. Such a program provides annual, renewable income for the running of the Academy and creates a baseline of philanthropic support on which new programs can be built.

As a direct result of the appeal, the Academy saw 42 new donors and many renewing donors contributing nearly \$22,000. This is important income for the Academy and we look forward to growing this appeal in 2017 as we continue to engage with our supporters across the Academy and the wider community.

Final pledges for the Enlightening Campaign contributed a further \$51,000 to Academy projects.

A gift from Professor David Solomon

Distinguished scientist Professor David Solomon AC FAA FTSE FRS made a generous commitment this year to support the Academy's 2017 national speaker series, 'Plastic Fantastic'.

The Academy's annual speaker series is part of our national engagement program designed to bring science to a broader audience with the aim of being entertaining and highly informative.

Plastic Fantastic will explore how polymers have shaped and continue to shape our lives. Talks will be held in Sydney, Melbourne, Adelaide, Wollongong and Brisbane. More information will be published soon on the Academy website.

The Academy thanks Professor David Solomon for supporting this valuable public outreach initiative.



Polymers continue to shape our lives. Photo: Simon D/Flickr

New partnership with University of Melbourne for women in science



Professor Andrew Holmes, Professor Suzanne Cory and Professor McCluskey at the Nancy Millis Medal for Women in Science partnership launch at Melbourne University

When microbiologist Professor Nancy Millis passed away in September 2012, some of her colleagues at the University of Melbourne came up with the idea that, by donating sufficient funds, they would enable a medal to be struck in her honour—and thus began the Nancy Millis Medal for Women in Science.

Major support from the University of Melbourne (<http://newsroom.melbourne.edu/news/new-funding-game-changer-recognition-leading-women-science>) to act as a partner in underpinning the award of the Nancy Millis Medal in perpetuity was announced earlier this year. The university's donation will allow the Academy and the university to work together in fully celebrating each recipient of the medal through joint recognition by both organisations.

The new Max Day Fellowship

A major donation from Dr Max Day AO FAA is being used to establish the annual Max Day Environmental Science Fellowship Award (<https://www.science.org.au/opportunities/research-funding/max-day-environmental-science-fellowship-award>) of up to \$20,000, which will help PhD students or early-career researchers meet costs associated with their research or to supplement PhD scholarships.

We sincerely thank Dr Day for his generosity.

Bequest update

A bequest is a special gift; a wonderful opportunity to ensure that the Academy remains a part of the lives of future generations.

Professor David Craig's bequest of \$50,000 which, at his request was directed to Primary Connections, will directly support the publication of four new Student Science Journals for year 5 students to be published in January 2017.

These journals support each curriculum unit and allow students to record all their work for a unit, lesson by lesson. The journals become a valuable record for both students and teachers and are a key component of the enquiry-based teaching and learning model which underpins Primary Connections.

Visit the Primary Connections website for more information: <https://primaryconnections.org.au/>

For a confidential discussion about naming the Academy in your will (<https://www.science.org.au/about-us/support-us/bequests>), please contact the Bequests Manager:

Isobel Griffin MFIA

Australian Academy of Science

GPO Box 783, Canberra ACT 2601

Telephone 02 6201 9400 or email Isobel.Griffin@science.org.au.



Professor David Craig's bequest supported Primary Connections

Supporting the work of National Committees

The Academy thanks the following organisations who support the valuable work of the Academy's National Committees.

Mike Smith Student Prize

The National Museum of Australia (NMA) (<http://www.nma.gov.au/>) and the National Committee for History and Philosophy of Science (<https://www.science.org.au/supporting-science/national-committees-science/national-committee-history-and-philosophy-science>) awards the biennial Mike Smith Student Prize for the History of Australian Science or Australian Environmental History. The NMA provides \$6,000 towards this activity: \$3,000 for first prize and the remaining towards a presentation ceremony and discretionary runner-up prizes.



The award is presented for an essay based on original research in the fields of environmental history or the history of science in Australia. The NMA and the Academy have awarded the prize since 2006, with the aim of nurturing young scholars and encouraging them to publish their research. In 2013 the prize was re-named after Australian archaeologist and NMA Senior Research Fellow Mike Smith in recognition of his contribution to mentoring young researchers.

Contributions from Australian societies and organisations to union subscriptions

For Australia to contribute internationally, it is essential that memberships to international unions of the International Council for Science (ICSU) are maintained.

Various Australian societies and organisations contribute towards Australia's annual subscriptions. In doing so, the Academy forms a partnership with the societies and other organisations via the relevant National Committee for Science.

The following bodies contribute 50% of related union dues:

- Australian Institute of Physics—towards the International Union for Pure and Applied Physics
- Royal Australian Chemical Institute—towards the International Union for Pure and Applied Chemistry
- Australian Mathematical Science Institute—towards the International Mathematical Union
- Geoscience Australia—towards the International Union for Geological Sciences
- Australian Antarctic Division—towards the Scientific Committee for Antarctic Research

Funding of decadal and strategic plans

Decadal plans are 10-year strategic plans for science disciplines. The purpose of a plan is to assess the current state of knowledge in a specific science discipline, identify and set priorities for the most important scientific questions for the next decade and outline strategies to achieve these priorities and goals. The diversity of each discipline makes the production of decadal plans exciting and unique projects. Decadal plans are produced by the research community, but the audiences for the documents are, to a large extent, policy makers and funding bodies.

The production of the plans is undertaken by the National Committees for Science with funding from government, industry and the research sector. Many professional bodies, universities and research organisations have financially contributed to the development of the plan, without which support the projects would be unfeasible. These organisations also contribute in-kind support and provide essential intellectual input.

The many organisations that support the production of these documents are listed on the plans' websites and within the individual publications.

More information on decadal and strategic plans: <https://www.science.org.au/support/analysis/decadal-plans-science>

Nova a favourite for curious minds

The Academy is very grateful for Telstra's generous donation for Nova: science for curious minds (<http://www.nova.org.au/>)—\$1 million over three years—which enabled the Academy to redesign and rebuild its science explainer website and employ a small but committed team to research and create topical and authoritative content.

Nova was shortlisted in the top five for an Australian Graphic Design Association award in November 2015.

Nova supports STEM literacy and attracts a broad audience through the website, social media and collaborations with other science communication providers. In recent times, the Australian Government and supporting science communication programs have reinforced the need for increased awareness and appreciation of science in Australia. Nova has an integral and growing part to play in building public knowledge and supporting scientific exploration and innovation.

The success of the first 18 months of the new Nova website is supported by the following data:

- 200,000 visitors to the site, more than 10% of who return to the site within a month
- 300,000 visits to the site
- nearly 2,000 email subscribers, 1,600 Facebook fans, and 700 Twitter followers
- 92 long-form topics reviewed by 165 experts
- Nearly 10 million total views on YouTube of 3 animated videos scripted and sponsored by Nova and created and published by German animators Kurzgesagt.

Nova's external collaborations so far include Kurzgesagt, Apple, CSIRO Double Helix magazine, the Qld Brain Institute, Swinburne University and the ANU's Centre for the Public Awareness of Science. Nova is also working to give the achievements of the Academy more broadly an accessible public focus.

Support for early- and mid-career researchers

EMCRs explore the frontiers of microbiome research

The 2016 Theo Murphy Australian Frontiers of Science symposium (<https://www.science.org.au/academy-newsletter/dec-2016-106/emcrs-explore-frontiers-microbiome-research>) brought 70 outstanding EMCRs from around the country to Adelaide to discuss the impact of microbes on us and the world around us. There was great enthusiasm from all delegates to stay connected and continue to find ways to work together. The symposium was generously funded by the Theo Murphy (Australia) Fund through the Royal Society of London. This funding facilitated the attendance of all delegates, effectively removing barriers to attendance such as cost, geography and caring responsibilities, and created an inclusive event.

Future leaders meet in Sydney

The Early- and Mid-Career Researcher (EMCR) Forum is the national voice of Australia's emerging scientists and is supported by the Australian Academy of Science. The EMCR Forum holds a national meeting, Science Pathways, every 18 months to engage EMCRs across all disciplines and from around Australia in active discussion. The event also offers professional development opportunities for EMCRs. In 2016 the topic was Future Leaders (<https://www.science.org.au/academy-newsletter/dec-2016-106/leadership-skills-under-spotlight-science-pathways>). Feedback from delegates demonstrated how much benefit young scientists received from attending the conference.

“It is exciting to think how this group may be able to drive change within the scientific community. ... just the real sense of excitement and energy about the whole thing.”
Science Pathways 2016 delegate

“Listening to the success stories of EMCRs to inspire me as well as getting tips on how to present oneself as a good leader”

“I better understand how to be a leader and manager and what to look for in other leaders and managers.”

“The inspiration I got from the sessions shared during the sessions and the networking—we can improve the system.”

The EMCR Forum thanks the sponsors who made the event possible.

The **University of Canberra** offered generous sponsorship for carer grants, which were offered for the first time this year. The grants enabled eight EMCRs with caring responsibilities to meet their responsibilities while at the conference. Some used the funds to pay for additional child care, while others brought children and carers along to the conference with them.

“I would like to express my sincere appreciation to the University of Canberra for their generous support to make my trip possible. Without their financial support, I couldn't attend such an informative conference which will play an important role in my career development.”

The **University of Newcastle** sponsored the networking event, giving delegates the chance to meet new people and form collaborations while bonding over the activity which asked them to demonstrate examples of poor leadership.

UNSW Australia generously provided the venue and catering.

The EMCR Forum also thanks the following sponsors for their generous support:

- Department of State Development, South Australia
- Office of the Chief Scientist and Engineer, NSW Department of Industry
- RMIT University
- Monash University
- Hunter Medical Research Institute

- ARC Centre of Excellence for Climate System Science
- QIMR Berghofer Medical Research Institute
- Jirra Wines
- CSL Ltd
- ARC Centre of Excellence for Electromaterials Science
- CSIRO
- University of Western Australian
- University of Queensland
- University of South Australia
- Telethon Kids Institute.

180 Seconds of Science

In 180 seconds, EMCRs were invited to showcase their innovative research to the public. The EMCR Forum and the Royal Society of New Zealand Early Career Forum worked together to run this video competition in Australia and New Zealand. The videos make scientific topics as diverse as volcanos, flexible solar cells and the behavioural effects of violent video games accessible to everyone.

The EMCR Forum thanks its award partners who enabled it to provide EMCRs with a platform to communicate their science and win great prizes:

- CSIRO SME Connect
- CSL Ltd
- New Zealand Ministry of Business, Innovation and Employment
- Garvan Institute of Medical Research
- John Morris Group.

Events

The Academy would like to thank the following sponsors for their valuable and generous support of its events.

Sponsors, Canberra public speaker series, Bots, Bacteria and Booze

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