

JULY 2020

NEWSLETTER

NUMBER 140



Message from the Chief Executive—July 2020

July 31, 2020



I hope this July newsletter finds you all safe and well.

The expertise of Academy Fellows continues to inform decision making in response to the COVID-19 pandemic. The Rapid Research Information Forum (RRIF) which was

established in April is playing an important role in providing independent, timely and accurate scientific advice to government. The RRIF is convened by Australia's Chief Scientist, and its operations are led by the Academy of Science. You can **access RRIF reports**¹ here and learn about the other resources the Academy has created to assist the community, teachers, researchers and decision makers more broadly.

Whilst the pandemic is challenging and has had many negative impacts on our society, the Academy recognises and applauds the Australian Government for consulting Australia's most distinguished scientists to help navigate these very complex and challenging times.

This informed and inclusive approach improves deliberations and strengthens all of us.

The Academy remains deeply concerned about the impact of COVID-19 on researchers, particularly early- and mid-career researchers who have limited job security yet are key contributors to the research undertaken across the country in an array of fields.

The July newsletter also offers some exciting developments about the **digitisation of the Academy's historic scientific archive**². Following our digitisation fundraising appeal, the generosity of donors has allowed us to purchase vital scanners and start the digitisation of some of our collections, making them accessible to all. Thank you to our supporters and friends for your contributions.

Finally, we look forward to our online National Science Week activities in August. It's clear that going online can make meetings and events more accessible and in the process open up science to a much wider audience.

I hope you enjoy the July newsletter.

Keep safe and well.

Anna-Maria

1 science.org.au/covid19/news-and-resources

2 science.org.au/academy-newsletter/july-2020-140/philanthropy-and-partnerships-update

Review finds investment in Australian astronomy is paying dividends

July 08, 2020



The Anglo Australian Telescope at Siding Springs Observatory. Photo: Ángel R. López-Sánchez

Australia's investment in astronomy and our hosting of two of the world's most powerful telescopes means we are well placed to contribute to more big international breakthroughs in our understanding of the universe, according to a **new review**³.

The mid-term review of Australia's 10-year plan for astronomy, overseen by the Australian Academy of Science's **National Committee for Astronomy**⁴, has also found Australian physicists and astronomers played a key part in some of the decade's biggest scientific discoveries.

The plan makes nine major recommendations for the next five years and details the ongoing investment into major facilities and infrastructure required for Australian astronomers to continue to play a world-leading role in answering key questions about our universe.



Watch 'Finally found! Universe's missing matter' on Vimeo: player.vimeo.com/video/42182236

The 2020 identification of the 'missing matter' of the universe used data on fast radio bursts collected by the Australian Square Kilometre Array Pathfinder (ASKAP) in Western Australia.

Australia is also home to the Murchison Widefield Array (MWA), which alongside ASKAP is located at the site of the future low-frequency telescope of the Square Kilometre Array (SKA), an international project headquartered in the United Kingdom and involving 13 other countries.



Professor Tamara Davis from the University of Queensland. Photo: supplied.

"The SKA is ground-breaking technology and right now we've got the MWA and ASKAP in operation—these are two technical demonstrations for the SKA but in their own right are the most powerful telescopes of their type in the world," said astrophysicist and mid-term review committee member Professor Tamara Davis from the University of Queensland.

"Australia is the envy of many international astronomers, partly because of our radio-quiet skies and important southern hemisphere location. We have a natural advantage in this regard and so many countries want to be involved in telescopes in Australia," Professor Davis said.

The review recommends Australia pursue realisation of the full Square Kilometre Array Observatory, while continuing to exploit its ASKAP and MWA pathfinders.



The Murchison Widefield Array (MWA) at night. Photo: John Goldsmith, Celestial Visions

³ science.org.au/astronomy-midterm

⁴ science.org.au/national-committee-astronomy

It also calls on Australia to pursue full membership of the European Southern Observatory (ESO), a 16-nation intergovernmental research organisation for ground-based astronomy.

Currently, the Australian Government has a strategic partnership with ESO until 2027, but full membership would provide ongoing access to enormous international telescopes like the Atacama Large Millimeter/submillimeter Array (ALMA) and the future Extremely Large Telescope in northern Chile.

Professor Lister Staveley-Smith from the University of Western Australia. Photo: supplied



“The Australian Government’s investment in a strategic partnership with the ESO has put the nation on the path to full ESO membership,” said the chair of the review committee, Professor Lister Staveley-Smith from the University of Western Australia.

“This partnership is unleashing major Australian-led science programs on the world’s most capable optical observatory and there’d be great benefit to see the agreement extend beyond 10 years,” said Professor Staveley-Smith.

The review makes seven other major recommendations including that Australia continue to build stronger ties between the Australian astronomy community, the wider Australian space science community, and the Australian Space Agency.



Dr Samuel Hinton, University of Queensland. Photo: supplied.

The review also highlights the contributions of the Australian astronomy community to mitigating the COVID-19 emergency. One astronomer, University of Queensland’s Dr Samuel Hinton, has been the lead data analyst for the COVID-19 Critical Care Consortium, with representatives from over 40 countries.

He constructed and maintained a data science pipeline which was responsible for ingesting raw

clinical data from hospitals around the world, then cleaning, standardising and processing the data into useful products for machine learning and statistical analysis. He talks about his contribution to fighting COVID-19 in the Academy’s **Latest from Science web show**⁵.

Read more about how astronomers have been able to contribute in a significant manner to mitigating the COVID-19 emergency on page four of the **mid-term review**⁶.



Watch ‘COVID-19 - The latest from science Episode 24’ on Vimeo: vimeo.com/435994771

Academy strengthens partnership with CSIRO to champion research

July 06, 2020



Scientists are encouraged to submit articles for publication in the CSIRO journals, supporting Australian science content and publishing. Photo: CSIRO

The Academy and CSIRO have signed a new five-year partnership agreement, strengthening their long-term commitment to Australian science as part of the global research enterprise.

The two organisations have long cooperated to publish the CSIRO-owned journals of scientific research which are published by CSIRO Publishing, an editorially independent not-for-profit business unit of CSIRO.

“This latest agreement recognises the joint commitment of the Academy and CSIRO in

5 youtube.com/playlist?list=PL9DfJTxCpPaXKZiJ1cZiolhxmJZmwfru_o
6 science.org.au/astronomy-midterm

advocating for and advancing open science, and the importance of diversity and inclusion in science,” said Academy Chief Executive, Anna-Maria Arabia.

“The ongoing partnership we have with CSIRO enables the Academy to contribute to CSIRO’s journals of scientific research, and to discussions about scientific and academic publishing.”

Editorial policy for the journals is developed by a Board of Standards, which is jointly chaired by CSIRO and the Academy.

“The current chairs are CSIRO’s Professor Lynne Cobiac and Academy Fellow Professor Max Coltheart, both of whom bring enormous experience and vision to the roles,” Ms Arabia said.

Academy Fellows and other scientists are encouraged to submit articles for publication in the CSIRO journals, supporting Australian science content and publishing.

The scientific journals covered by the agreement are:

- Animal Production Science
- Australian Journal of Botany
- Australian Journal of Chemistry
- Australian Journal of Zoology
- Australian Systematic Botany
- Crop and Pasture Science
- Environmental Chemistry
- Functional Plant Biology
- Invertebrate Systematics
- Marine and Freshwater Research
- Pacific Conservation Biology
- Reproduction, Fertility and Development
- Soil Research
- Wildlife Research

Find out more about CSIRO’s journals of scientific research⁷. CSIRO Publishing supports both ‘Green’ and ‘Gold’ Open Access to help authors reach the broadest audience and to

enable unrestricted access to scholarly research. All Open Access articles undergo the same rigorous peer review as those published under a subscription model.

More work crucial to help our soil recover from bushfires

July 22, 2020



Charcoal, ash, and red soil left after a bushfire. Photo: Professor Rob Fitzpatrick

With much of the nation focused on the loss of lives and the destruction of property and wildlife from last summer’s bushfires, the significant damage to Australian soil may have gone unnoticed by many.

With our agricultural productivity and the recovery of native vegetation now at stake, soil experts say that more work is crucial to helping this essential resource recover. They are also calling for a nationally consistent approach to the way soil data is collected, stored and accessed.

The recommendations are part of a bushfire expert brief, **Soil Conditions After Bushfires**⁸, published today by the Australian Academy of Science.



Professor Alexander McBratney. Photo: supplied

Academy Fellow Professor Alexander McBratney, was one of the experts who contributed to the document.

⁷ publish.csiro.au/journals

⁸ science.org.au/supporting-science/science-policy-and-analysis/evidence-briefs/soil-condition-after-bushfires

“The bushfires severely damaged millions of hectares of land, not just above ground but the soil beneath us. This has clear implications for soil fertility, Australia’s agricultural productivity and the recovery of native vegetation,” said Professor McBratney, who is based at the University of Sydney.

“As a nation we can do more to monitor our soils. Post-bushfires there are opportunities to improve and implement initiatives to better manage Australian soils as we develop a soils recovery plan.

“A nationally consistent framework for soil data collection, storage and accessibility is important to provide the scientific evidence that underpins policy development,” Professor McBratney said.

The expert brief discusses the effects of bushfires on soil condition. It also highlights research that has found significantly lower nutrient levels, such as phosphate and nitrate, in the soil for up to 80 years following a fire event. Changes to nutrient levels can result in severe deterioration to soil condition with major ecological and functional implications.

At a bush summit last year, **Australia’s Prime Minister Scott Morrison acknowledged⁹** that Australia’s soils are under strain and highlighted the benefits and importance of good soil management.

Professor Rob Fitzpatrick.
Photo: supplied



Fellow of the Australian Academy of Technology and Engineering, Professor Rob Fitzpatrick from the University of Adelaide, also contributed to the expert brief.

“We need to accurately monitor our soils and ecosystems before fires, and start documenting fire intensity and severity and ensure soil assessment and management are integrated fully into bushfire recovery programs,” Professor Fitzpatrick said.

“The successful recovery of Australia’s soil condition also extends further than the immediate soil ecosystem,” he said.

“Interlinked systems such as biodiversity and conservation programs, agricultural and horticultural industries, and broader ecosystem services will also benefit from better monitoring and management of soil condition.

“We look forward to working with the National Advocate for Soil Health, Major General Michael Jeffery, state governments and other stakeholders, on initiatives to better manage Australian soils.”

The Soil Conditions After Bushfires brief is the first in a series that will be published by the Australian Academy of Science in the coming weeks. Future briefs will cover topics including wildlife monitoring, ecosystem services, human health, and remote sensing and data availability.

Leading scientists to give evidence to Senate inquiry into Australia’s unprecedented bushfires

July 29, 2020



Watch ‘Summer bushfires: the toll on nature’ on Vimeo: player.vimeo.com/video/441915529

A Senate committee examining Australia’s bushfires will today hear how Australia must deal with extreme weather events more effectively than is currently the case.

“Scientific evidence shows that as the world warms due to human-induced climate change, we experience an increase in the frequency and severity of extreme weather events,” reports **the submission by the Australian Academy of Science¹⁰**.

⁹ [youtube.com/watch?v=V2z7sg2uzL8](https://www.youtube.com/watch?v=V2z7sg2uzL8)

¹⁰ [science.org.au/supporting-science/science-policy-and-analysis/submissions-government/lessons-learned-bushfire-season](https://www.science.org.au/supporting-science/science-policy-and-analysis/submissions-government/lessons-learned-bushfire-season)

“As such [extreme weather] events become more frequent and severe, we must adapt Australia and Australians accordingly, and strengthen our mitigation efforts.

“Bushfires, along with other weather and climate challenges, pose complex and wide-ranging problems. Climate change, temperature extremes, droughts, storms, wind, and floods are intersecting and entangled. These must be addressed together.”

Academy Fellows Professor David Lindenmayer and Professor Chris Dickman will appear today before the **Senate Standing Committee on Finance and Public Administration**¹¹ inquiry on behalf of the Academy.

They will tell the committee that the monitoring of Australian landscapes must be given the highest priority to give affected species and ecosystems the best chance of recovering from this summer’s bushfires.

Professor Dickman said Australia does not have really effective monitoring in much of the forest and woodland estate.

“The consequence is that it is very difficult now to get a handle on exactly what the fires have done,” said Professor Dickman, who is based at the University of Sydney.

“My worst fear is that some species whose ranges were largely in the path of the fires and were already in poor shape to begin with will actually have disappeared—there’ll be extinction at the species level.”

Professor Lindenmayer said important monitoring work initiated by the Department of Agriculture, Water and the Environment in conjunction with other organisations and researchers—but restricted by safety concerns and interrupted by the COVID-19 outbreak—must be continued and backed up by meaningful management actions.

“The Academy is resolute that the response to the bushfires must extend beyond the immediate and essential need to rebuild and recover,” said Professor Lindenmayer, who is based at the Australian National University.

“While immediate responses are important, broader issues including habitat restoration; biodiversity and species preservation; land, water and wildlife management; agricultural practices and more will need careful and measured consideration.”

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

The Academy’s submission also highlights the importance for the Senate—and all Australians—to have trustworthy information and answers about impacts of the 2019–20 megafires.

It says “with much misinformation in the public domain about the cause and impacts of the bushfires, we urge Australians to continue to consult reputable sources of evidence-based information such as the Australian Academy of Science, CSIRO and the Bureau of Meteorology.”

The Academy has also today published the **second in a series of expert briefs**¹² on bushfire recovery. The new brief covers the impacts of bushfire on Australian wildlife, and the role of immediate and long-term monitoring to inform protection and maintenance actions to preserve our unique ecosystems. The first brief focused on the **condition of soil after bushfires**¹³.

The Academy is also currently considering the recommendations of the interim report into the review of the Environment Protection and Biodiversity Conservation Act published last week. **Read the Academy’s initial submission to the review**¹⁴.



Effective wildlife monitoring, such as this Queensland BushBlitz expedition, is lacking in much of Australia’s forests. Photo: Gary Cranitch/Queensland Museum

11 aph.gov.au/Parliamentary_Business/Committees/Senate/Finance_and_Public_Administration/Bushfirerecovery

12 science.org.au/supporting-science/science-policy-and-analysis/evidence-briefs/monitoring-wildlife-recovery

13 science.org.au/supporting-science/science-policy-and-analysis/evidence-briefs/soil-condition-after-bushfires

14 science.org.au/supporting-science/science-policy-and-analysis/submissions-government/independent-review-epbc-act

Local community needs must not be overlooked as we adapt to climate change

July 27, 2020



Retrofitting existing housing and preparing for coastal inundation and storms are just a few of the issues that need to be considered in community-led approaches to climate change adaptation in Australia. Photo: Pixabay

The needs of local communities are at risk of being overlooked as Australia grapples with how to adapt to climate change, **according to leading climate change adaptation experts**¹⁵.

The finding follows a series of recent meetings of national leaders hosted by Future Earth Australia, a program of the Australian Academy of Science.

Leaders from across the private and finance sectors, all levels of government, Indigenous communities, land management, social services and universities in all states and territories gathered from 13 to 16 July 2020 for **'Securing Australia's Future: Reimagining Climate Adaptation'**¹⁶.

The meetings, which come ahead of a planned National Adaptation Summit in 2021, took stock of Australia's successes, failures, opportunities and pathways for adapting to a changing climate, with a focus on the role of community-led approaches to adaptation.

Australian National University Emeritus Professor Stephen Dovers said there has long been a national focus on climate science, when what was

needed was a shift to also prioritise the social adaptation needs for local communities.

"One example is the need to retrofit housing for variable climates," said Emeritus Professor Dovers, who is past Chair of the Steering Committee of Future Earth Australia.

"Some local communities feel resilient and well-adapted to looming climate change shocks, but not others. We know that there is a desire among local communities to engage in the planning that is underway to adapt to a future that will see a drastically different climate and environment."

University of Sydney Professor David Schlosberg said meeting participants found that a forward-looking approach to adaptation requires engaging community values and vulnerabilities, in addition to climate risks, and to be working towards an actionable and tangible agenda that benefits local communities.

"Good adaptation policy requires recognition of both the variety of knowledge types necessary to build adaptation pathways, and the role of different sectors—economic, social, environmental and cultural—in developing and implementing policy and action," said Professor Schlosberg.

Meeting participants also found:

- there is a clear role for top down leadership from the Australian Government, in conjunction with well supported and financed local or regional 'bottom up' initiatives
- a strong policy framework is necessary from governments at all levels, to enable the necessary and broader social and community engagement.

Future Earth Australia Director, Dr Tayanah O'Donnell, said adaptation had come into sharp focus in the wake of the unprecedented bushfire season experienced in the summer of 2019–20, and now the COVID-19 pandemic, with both having ongoing, profound impacts on our wellbeing and economy.

"Effective adaptation in Australia acknowledges that increasing bushfire risk is only one dimension of climate change adaptation. Coastal inundation, storms, drought, heatwaves, business viability in a low carbon economy, biosecurity issues, and

¹⁵ futureearth.org.au/initiatives/securing-australias-future

¹⁶ futureearth.org.au/publications/securing-australias-future-roundtable-summary

increased threats to human health, also demand coordinated attention,” Dr O’Donnell said.

“The bushfires and COVID-19 are major disruptions which have presented an unusual opportunity to consider how Australian society can prepare and act to adapt to these complex challenges.

“These roundtables are the start of a longer conversation and national agenda setting strategy being led by Future Earth Australia at the Australian Academy of Science.”

The National Adaptation Summit in 2021 will be hosted by the University of Sydney, Western Sydney University and Future Earth Australia.

Future Earth Australia has today opened public submissions on this topic. The consultation, which is open until 30 October 2020, seeks contributions on the successes, failures, opportunities and pathways for adaptation, with a particular interest in learning about community-led approaches taking place.

More information on the initiative¹⁷

Academy supports IAP communiqué on global green recovery after COVID-19

July 23, 2020



Watch ‘COVID-19 recovery must be green, says world academies network’ on Youtube: youtu.be/8evIOwRn5Mg

The Australian Academy of Science supports the below statement published recently by the **InterAcademy Partnership**¹⁸ (IAP). The IAP is composed of more than 140 learned academies around the world, including the Australian Academy of Science. In this communiqué, the IAP calls on the global community to ‘build back better’ during and after the pandemic, focusing on a green recovery.

Its key message is that only a low-carbon recovery will simultaneously provide for social equity, the environment, and human health.

The Academy has previously joined with other Commonwealth academies **to call on governments for a sustainable recovery from COVID-19**¹⁹.

Read the full statement below.

Science can ensure social equity, health, and economic benefits

July 7, 2020

The COVID-19 pandemic is imposing devastating health and social costs worldwide. At the same time, the climate emergency demands urgent and resolute action. This is why today, under the umbrella of the InterAcademy Partnership (IAP), 140 medical, scientific and engineering academies from around the world **urge world leaders to focus on a green recovery when planning for economic activity after the pandemic**²⁰. Their **key message in their communiqué**²¹ is that only a low-carbon recovery can generate co-benefits for social equity, the environment, and human health.

“It is clear that health and sustainability should be central to the post-pandemic economic response. Now it is time to make a choice. Either, societies return to the old pathways embedded in high-carbon economies that pose major threats to health and sustainable development. Or seek low-carbon socioeconomic pathways to protect and promote human health and enhance the prospects for an equitable recovery compatible with the commitments in the Paris

¹⁷ futureearth.org.au/initiatives/securing-australias-future

¹⁸ interacademies.org/31840/About

¹⁹ science.org.au/news-and-events/news-and-media-releases/academy-supports-iap-communique-covid-19

²⁰ interacademies.org/greenrecovery

²¹ interacademies.org/greenrecovery

Climate Agreement,” says **Volker ter Meulen, IAP President**²².

IAP academy members constitute more than 30,000 leading scientists, engineers and health professionals in over 100 countries. IAP’s analysis **‘Global Green Recovery After COVID-19: Using scientific advice to ensure social equity, planetary human health, and economic benefits’**²³ draws on previous work by academies to identify challenges and science-based solutions across multiple sectors to effect fundamental recovery transitions worldwide that support the imperative for rapid decarbonization.

“We must rapidly reduce fossil fuel use and other sources of greenhouse gas emissions, and recognise the value of ecosystem services and of the potential for climate change mitigation policy to bring significant human health benefits,” says **Cherry Murray, co-chair, IAP Science**²⁴. “It has been said before, but it is worth repeating: We need to ‘build back better,’” adds Murray.

“International coordination is paramount, and we must focus our attention on the needs of the most vulnerable. Our recovery actions should take into account existing strategic initiatives, in particular the United Nations’ Sustainable Development Goals and other UN Agreements on biodiversity and climate change. But these urgent priorities necessitate strengthening the capacity to support science-informed decision-making at national, regional and global levels,” says **Masresha Fetene, co-chair, IAP Policy**²⁵.

Noting that the COVID-19 pandemic has accentuated health inequities, with a disproportionate impact on already vulnerable populations, **IAP recently joined other health organisations in an open letter to the UN**²⁶ calling for measures to reduce health inequity not only as this pandemic continues, but also in developing plans for preparedness and responsiveness to future threats.

As a follow-up to this letter, IAP President Volker ter Meulen recently spoke alongside the Director-General of the World Health Organization (WHO) Tedros Adhanom Ghebreyesus and others at the

launch of the Global Sustainable Health Equity Movement²⁷, and IAP’s new analysis points out that also the green recovery must be rooted on fair and equitable strategies, leaving no one behind.

The new communiqué, available online at www.interacademies.org/greenrecovery, was signed by the Steering Committee members of the InterAcademy Partnership:

- Volker ter Meulen, IAP President
- Depei Liu, IAP President and Co-chair, IAP Health
- Margaret Hamburg, Co-chair, IAP Health
- Krishan Lal, Co-chair, IAP Science
- Cherry Murray, Co-chair, IAP Science
- Masresha Fetene, Co-chair, IAP Policy
- Richard Catlow, Co-chair, IAP Policy.

Australian fellowship recipients participate in Lindau Online Science Days

July 13, 2020

Nobel Laureate and Academy Fellow, Professor Elizabeth Blackburn, shares advice during the Online Science Days. Credit: Wenye Zou.



The COVID-19 pandemic has not stopped Australian delegates to the 70th Lindau Nobel Laureates Meeting participating in four days of online discussion and debates with Nobel laureates and other young researchers from around the world at the Lindau Online Science Days. The delegates are recipients of the SIEF–AAS Fellowship to the Lindau Nobel Laureates

22 interacademies.org/person/volker-ter-meulen

23 interacademies.org/greenrecovery

24 interacademies.org/person/cherry-murray

25 interacademies.org/person/masresha-fetene

26 interacademies.org/news/open-letter-un-health-inequity-during-pandemic-cry-ethical-global-leadership

27 interacademies.org/news/iap-joins-launch-global-sustainable-health-equity-movement

Meeting, an annual gathering of bright young researchers from around the world and dozens of Nobel prize winners in Lindau, Germany

The 2020 interdisciplinary-themed 70th meeting has been postponed until 2021 due to the pandemic but the 11 Australian participants took part in the **Online Science Days**²⁸ from 28 June to 1 July. Five delegates additionally participated in the **Sciathon**²⁹, a 48 hour science marathon to tackle topics under three major themes: implementing the Lindau guidelines, capitalism after coronavirus, and communicating climate change.



Australian delegate Dr Eugene Sachkou after the announcement of the Sciathon results in the Communicating Climate Change. Photo: Eugene Sachkou.

Australian delegate Dr Eugene Sachkou from the University of Queensland was in the winning group of the communicating climate change section of the Sciathon. **Their project**³⁰ suggests using a ‘big data approach’ to identify influencers on social media who would have the most effective reach for climate change communication.

Coastal climate researcher Ms Nicole Foster from the University of Adelaide, who **posted about her experience on her blog**³¹, said “My favourite aspect of the entire experience was that I was able to make connections with scientists around the world regardless of time zones and technology. This has made me so excited for to see what can happen when we meet in person next year.”

And materials chemist Dr Wenyue Zhou from RMIT, describing the experience of meeting Nobel laureates online, said “The Online Science Days really helped me prepare myself for next year’s meeting. Before this, I was excited but very nervous about meeting the Nobel laureates... Attending the Online Science Days made them

very familiar to me. Now I see they are human beings, extremely kind, intelligent, humorous human beings.”

The Academy was also featured in the Academic Partners Expo Booth, where we highlighted the experiences of past attendees and Nobel Laureate and Academy Fellow Professor Brian Schmidt in a short video, and gave a presentation followed by a Q&A session with Academy Fellow Professor Jim Williams.

The SIEF–AAS Fellowships are supported by the Science and Industry Endowment Fund. **Find out more about the Lindau Aussies**³².

Academy Fellows awarded with Australian Laureate Fellowships

July 07, 2020



(L to R) Professor David James, Professor Harvey Millar, Professor Martina Stenzel and Professor Toby Walsh.

Four Fellows of the Australian Academy of Science are among the 2020 Australian Research Council (ARC) Australian Laureate Fellows, announced on 6 July by the Hon. Dan Tehan MP, Minister for Education.

The ARC Fellowship scheme provides funding for academics to lead research projects in priority areas of national interest. The scheme funds world-class endeavours in both basic and applied research and supports the appointment of early-career researchers.

The four Academy Fellows among the 14 recipients of the ARC funding scheme include Professor Martina Stenzel, Professor Toby Walsh, Professor David James and Professor Harvey

28 mediatheque.lindau-nobel.org/meetings/2020

29 sciathon.org

30 sciathon.org/results

31 into-the-ocean.com/2020/07/03/what-did-i-learn-from-4-days-listening-to-nobel-laureates

32 science.org.au/lindau-aussies

Millar. Their research projects span diverse research areas of critical importance, including nanotechnology, artificial intelligence, the genetics of ageing and plant science.

The Fellowships have been awarded to the research leaders for the following projects:

- **Professor Martina Stenzel FAA**, Scientia Professor in polymer chemistry at the University of New South Wales and Chair of the National Committee for Chemistry, will develop a toolset that allows the design of very small nanoparticles that display enhanced biological activity for applications in nanomedicine, catalysis and sensors.
- Leading artificial intelligence (AI) researcher **Professor Toby Walsh FAA** of the University of New South Wales will work on building fairer, more efficient and trustworthy AI systems to improve the competitiveness of Australian businesses and the delivery of health services.
- At the University of Sydney, pioneering metabolic systems and cellular biology researcher **Professor David James FAA** will dissect how genes interact with the environment to better understand the ageing process and lay the foundation for personalised health strategies.
- Plant protein biochemist and newly elected Academy Fellow **Professor Harvey Millar FAA** of the University of Western Australia will study processes and genes that regulate degradation of proteins in wheat and barley plants to benefit Australia's grain industries.

More information about the ARC's Australian Laureate Fellowships scheme³³.

Fellow's donation set to change the lives of upcoming scientists

July 06, 2020

A generous donation by Academy Fellow Professor Michael Barber is set to make an enormous difference to the career trajectory of young or emerging scientists by enabling the Academy to engage two science policy interns

in the coming months, ensuring gender diversity amongst them. He has also pledged a further donation the following financial year.



Professor Horace Barber FAA FRS and Professor Michael Barber AO FAA FTSE.

Professor Barber, whose donation of \$25,000 will be applied in the 2020–21 financial year, hopes that the internship will provide policy, political and social insight and networking opportunities for talented scientists who are keen to understand the broader context in which science operates. He also hopes that his donation will inspire others to support the valuable work of the Academy.

Elected to the Academy in 1992, Professor Barber has served on committees and supported international relations. He has been elected to Council several times, including advising on science policy, and is currently the Academy's Treasurer. He is also a member of the Development Advisory Committee which supports the Academy's partnerships and fundraising activities.

This story, however, goes back even further for Professor Barber. He proudly speaks of his father Professor Horace Barber, also a Fellow of the Academy who was elected in 1958 in the founding years of the organisation. This rare father–son duo is a remarkable example of intergenerational dedication to research and service to science.

Professor Michael Barber is internationally known for his substantial contributions to the mathematical development of statistical mechanics. His father, Professor Horace Barber,

³³ arc.gov.au/grants/discovery-program/australian-laureate-fellowships

was distinguished for his contribution to plant cytogenetics.

“The donation from Professor Barber comes at a time when defining decisions are being made by the government about Australia’s future. Decisions that will shape our lives well beyond COVID-19,” Academy Chief Executive, Anna-Maria Arabia said.

“Fellows and other leading experts have worked with the Academy to find ways to serve the country by providing the best scientific information available to support decision-makers at this critical time. They inspire me every day.

“The Academy thanks Professor Barber for being among the visionary Australians who recognise and support our work. With his help the Academy is providing evidence to inform decision making at the highest levels to improve our national wellbeing and provide strong national leadership to build a society that is guided by and enjoys the benefits of science.”

The science policy internship will be announced on our website, once open for applications.

Academy hosts conversation with Israeli Nobel Laureate

July 21, 2020



Watch ‘Q&A with Nobel Laureate, Professor Aaron Ciechanover’ on Youtube: youtu.be/_HTRyQo6pNo

There’s no way to rush a COVID-19 vaccine, according to Nobel Laureate Professor Aaron Ciechanover. “In the end we shall develop [a

vaccine]. There is no doubt about it, but the way, it’s very long and we have to test every step and make sure before we move to the next one, because lives of people are at stake.”



Nobel Laureate Professor Aaron Ciechanover. Image supplied by Technion Australia

Professor Ciechanover made the comments in a recent Academy webinar, held in partnership with **Technion**

Australia³⁴ and the **Embassy of Israel Canberra**³⁵.

The webinar was held to celebrate Australia and Israel’s bilateral science, research and innovation relationship, which is underpinned by the Australia–Israel Agreement on Bilateral Cooperation in Technological Innovation and Research and Development that was **announced in 2017**³⁶ and came into force in 2018.

In conversation with Academy Chief Executive Anna-Maria Arabia, Professor Ciechanover discussed the future of medicine and cancer research, Israel’s unique entrepreneurial ecosystem, and his own personal journey to winning a Nobel Prize.

In 2004, Professor Ciechanover, together with Professor Avram Hershko and Professor Irwin Rose, received the **Nobel Prize in Chemistry**³⁷ for their discovery of the ubiquitin protein. The treatment of cancers and degenerative diseases was transformed by the discovery of how ubiquitin removes unwanted proteins.

“It started with a laboratory in Israel, in some vague idea. It now has become a huge stream of knowledge, pharmaceutical company scientists work on it all over the world. [Did] we know it? No, of course not at the beginning, you’re busy with your problem. We knew that what we are finding is novel, but we didn’t know that it’s important.”

Asked what he thought posed the greatest danger to the future of medicine, he replied:

“Climate change. Forget about medicine, [climate change] hasn’t taken a sabbatical during the pandemic. And if we are not going to think about

34 austechnion.com

35 embassies.gov.il/canberra/Pages/default.aspx

36 minister.industry.gov.au/ministers/sinodinos/media-releases/strengthening-economic-and-technological-ties-israel

37 nobelprize.org/prizes/chemistry/2004/ciechanover/facts

it seriously and globally, we are going to destroy this planet in no time. We don't notice it because we say, 'It's not my business. My children will take care of it', but it's coming and it's accelerating. We should take it extremely, extremely seriously in medicine."

He also spoke about personalised medicine and how it will change disease treatment.

"Medicine of today, with all its advantages, what I call 'one size fits all'. It's a pyjama way of treatment ... something that we buy in order to warm ourselves up. When we buy, we don't care much about the size. When the patient comes with a cancer, either we can operate on it, or we bombard the patient with chemotherapy and radiotherapy. That goes well beyond the tissue itself [with] side effects: balding, vomiting, the bone marrow suppression. You're shooting a fly with a cannon ... And what's happened is that we've now started to identify the needle that we can use to punch this fly, and the needle is called our DNA."

The webinar was opened by Ambassador Mark Sofer of the **Embassy of Israel Canberra**³⁸, and Ori Danieli of **Technion Australia**³⁹.

Expert working group appointed for Future Earth Australia's strategy on sustainable oceans and coasts

July 06, 2020



Future Earth Australia's Sustainable Oceans and Coasts initiative is set to develop a ten-year national strategy to ensure that our oceans and coasts remain healthy and resilient. Image: Unsplash; CCO

For many Australians, the nation's coasts and oceans are central to our self-image. These areas are some of our busiest locations and are among the fastest growing economic sectors. However, the fragmented way we currently manage and govern the ecological and social processes that connect ocean and coastal waterways puts them under threat.

Future Earth Australia's **Sustainable Oceans and Coasts initiative**⁴⁰ is set to develop a ten-year national strategy to ensure that these areas remain healthy and resilient. This strategy will outline the steps needed to transform how we think about, govern, and protect oceans and coasts across Australia, and serve as a blueprint for the national transformational change that Australia's oceans and coasts need.

This week, Future Earth Australia is pleased to announce the formation of an **Expert Working Group**⁴¹ that will provide strategic direction and development of the strategy. This initiative, generously supported by the **Lord Mayor's Charitable Foundation**⁴², will represent a unique, cross-sectoral, transdisciplinary effort to improve Australia's ocean and coastal future.

The Expert Working Group, co-chaired by Dr Beth Fulton of CSIRO and Emeritus Professor Nick Harvey of the University of Adelaide, comprises a group of leading experts across ocean and coastal research, practice and policy from around Australia. This group will oversee the development of the strategy, providing their deep working knowledge of Australian oceans and coasts and contributing to the writing of the strategy.

The strategy is poised to make waves globally as well as locally, as worldwide initiatives for the decade are focused on oceans and coasts. The United Nations Decade of Ocean Science for Sustainable Development will run 2021–2030, with a strong focus on ocean health and sustainable development of the ocean. The UN Decade on Ecosystem Restoration, which will also run 2021–2030, is set to look to the oceans and coastal waters in helping to combat climate

38 embassies.gov.il/canberra/Pages/default.aspx

39 austechnion.com

40 futureearth.org.au/initiatives/ocean-and-coastal-sustainability

41 futureearth.org.au/initiatives/ocean-and-coastal-sustainability/oceans-and-coasts-expert-working-group

42 lmc.org.au/about

change, ensure food security and conserve biodiversity.

“To achieve a sustainable future, by meeting the Sustainable Development Goals by 2030 and focusing on ocean science for sustainable development and ecosystem restoration, we need integration across sectors and expertise,” said Director of Future Earth Australia, Dr Tayanah O’Donnell.

“Our coasts and oceans are fundamental to securing futures for all Australians”.

The first meeting of the Expert Working Group will take place in the context of the COVID-19 epidemic. Professor Harvey noted that this crisis has demonstrated the importance of a coordinated and integrated approach across boundaries. “Our strategy should recognise that our oceans and coasts do not respect state or other jurisdictional boundaries. We need a coordinated and sustainable approach”.

The different sectors of the ‘blue economy’, the industries that operate in the ocean and along its coastal margin, are seen as an important part of future sustainable development. It is important however, that the sustainability ethic is not lost.

“If anything good can come from COVID-19, it is using the disruption as a pivot point to embed sustainability at the core of what we do going forward, to put us in a better place to deliver,” said Dr Fulton.

The Sustainable Oceans and Coasts strategy will be the second targeted strategy created by FEA, following the successful development of an **urban sustainability plan**⁴³ that was launched in December 2019 at the State of Australian Cities Conference. This plan was developed through extensive consultation with key stakeholders across sectors and Australian cities and written by an expert reference group representing urban research, practice and policy and the FEA Secretariat.

The next steps of the Sustainable Oceans and Coasts initiative will include a series of virtual

consultation workshops and interviews with key stakeholders, as well as opportunities for written submissions.

To stay updated on the Sustainable Oceans and Coasts initiative, you can visit FEA’s dedicated **webpage**⁴⁴ for the strategy and follow FEA on **Twitter**⁴⁵.

Academy gears up for National Science Week

July 28, 2020



Find out how science can help us protect our oceans and manage the threat of bushfires during National Science Week.

How can science help us protect our oceans and manage the threat of bushfires?

This year for National Science Week in August, the Academy will be bringing the latest from science to you with two special online events addressing these important questions. Leading researchers will reveal how science can help us in times of national crisis, now and in the future. And you won’t even have to get out of your ‘working-from-home’ attire to attend!

- **Register for ‘Innovations to save our oceans’**⁴⁶
- ‘Fighting bushfires from space’ (information coming soon)

We’ll also be featuring engaging online content to keep your science brain ticking all week.

Make sure to keep an eye out on **Facebook**⁴⁷, **Instagram**⁴⁸ and **Twitter**⁴⁹.

43 futureearth.org.au/sites/default/files/2019-12/Final%20Cities%20Decadal%20Plan%202020-2030.pdf

44 futureearth.org.au/initiatives/ocean-and-coastal-sustainability

45 twitter.com/FutureEarthAus

46 science.org.au/news-and-events/events/innovations-save-our-oceans

47 facebook.com/AustralianAcademyofScience

48 instagram.com/ausacademyofscience

49 twitter.com/Science_Academy

Aiming to inspire interest and participation in science, National Science Week is Australia's annual celebration of science and technology. Running this year from 15 to 23 August, it features more than 1000 events with more than one million people participating across the nation. This year, with **online events**⁵⁰ and virtual tours from around the country and **DIY Science resources**⁵¹, there is plenty to get involved with.

The Academy also encourages Australian scientists to get involved wherever they are by sharing their own stories during National Science Week on social media. Join in the #STEMsavinglives and #SolveItWithSTEM campaign by grabbing a selfie or posting a 30 second video of you in the lab or workplace and tell us how you use STEM to solve problems or save lives.

Make sure to use the hashtags and to tag the Academy (@Science_Academy) and National Science Week (@Aus_ScienceWeek) to increase your chance of a retweet.

Planning for the Academy's online events is still underway, but all the details will soon be at science.org.au/events or via our social channels. **Subscribe to receive emails about all the Academy's events**⁵².

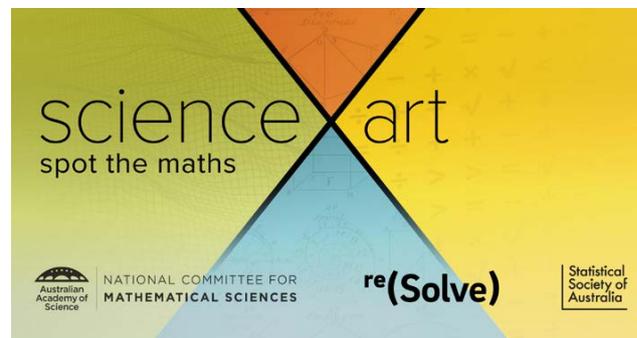
How will you science this **#scienceweek**?

Exciting prizes announced for scienceXart: spot the maths

July 29, 2020

Exciting educational and inspirational prizes for this year's **scienceXart: spot the maths** competition have been announced. 'scienceXart' is a competition that combines science and art, hosted by the Academy's National Committee for Mathematical Sciences.

Prizes will be awarded for the winning photographers and their classes, with a special prize for photos that feature statistics. The prizes have been curated by the Academy's maths education experts and are supported by the **Australian Mathematical Society**⁵³ and the **Statistical Society of Australia**⁵⁴.



Prizes include:

Foundation to Year 3—Cubetto⁵⁵

Cubetto are robots for early learning that encourage students to solve problems and engage with technology through code without the need for reading comprehension. The bright colours and storytelling potential make every play session with Cubetto a unique and memorable adventure.

Year 4 to Year 6—Micro:bits⁵⁶

Micro:bits are tiny computers that come packed with accessories. Through block coding or Python, students can program their Micro:Bit to do a variety of tasks including make a pet, or create a game or even a weather station. Micro:bits inspire young people to be creative and innovative as they code and design whatever they desire!

Year 7 to Year 9—CoDrone⁵⁷

The CoDrone with added Camera (FPV) Kit is a programmable drone that requires assembly. Students will gain skills in assembling, programming and flying a drone, providing opportunities to learn while doing and apply their knowledge of design, technology and geospatial coordination.

50 scienceweek.net.au/find-events

51 scienceweek.net.au/diy-science

52 science.org.au/subscribe-academy-newsletters

53 austms.org.au

54 statsoc.org.au

55 primotoys.com

56 microbit.org

57 roboink.com/codrone

Year 10 to Year 12—3D Printer⁵⁸

With a 3D-printer, students combine their knowledge of maths and art in an innovative and creative way through both physical and digital prototyping and fabrication. Students will gain skills in 3D modelling, design, user considerations and scaling while being able to create a physical prototype.

The second prize for all categories will be a \$100 prize pack of engaging and fun learning resources.

The winner of the entry featuring statistics will receive a prize pack for their class curated by the Statistical Society of Australia. This pack will include engaging learning resources that seek to combine statistics and art.

Be creative, spot the maths that is all around you. Take a photo of the maths you see in your life. Photos can be set up in advance, but you might also spot some maths on your way to school or around your house.

More information about the scienceXart competition⁵⁹

Statistical Society of Australia National Schools Poster Competition

The **Statistical Society of Australia**⁶⁰ is also supporting another competition for school students. The SSA National Schools Poster Competition is a fun, project-based learning activity which encourages primary and secondary school students to develop, implement and creatively report on an investigation on any topic of interest to them, with the opportunity to win great prizes.

More information about the SSA poster competition⁶¹

Water and light—the Jaeger Room is ready for your next event

July 29, 2020



The Jaeger Room in the Shine Dome can be set up for many purposes and holds up to 200 people.

Canberra's heritage building, the Shine Dome, is rich with the history of some of the brightest minds in Australian science. As COVID-19 restrictions ease, the Academy encourages event bookings. It is the ideal location for any type of event.

The largest single-level venue space in the Shine Dome is the versatile Jaeger Room, bathed in natural light. The floor-to-ceiling windows overlook the dome's moat and the stunning Nishi Building nearby and provide glimpses of Lake Burley Griffin. The room is named after eminent Australian scientist, Professor John Conrad Jaeger, pronounced 'jay-ger'.

The Jaeger Room can be set up for many purposes, and holds up to 200 people for cocktail-style events and 150 theatre style. It's been the venue for wedding, memorials, launches and art events.

Should physical distancing or travel restrictions still be in place closer to your booking date, the venue team will help you rearrange your event date and transfer all money paid to the new date.

Find out more about the Shine Dome as a venue⁶² or contact the team on shinedome@science.org.au

Professor John Conrad Jaeger

Jaeger made important contributions in geothermal studies and rock mechanics. He became part of the Australian National

⁵⁸ flashforge.com/consumer/detail/Adventurer%203?id=3

⁵⁹ science.org.au/sciencexart/spot-the-maths

⁶⁰ statsoc.org.au

⁶¹ ssapostercomp.info

⁶² shinedome.org.au

Research Council in 1947 and was among the first group of Academy Fellows elected in 1954. He was a member of Council of the Academy over the period of 1957–1959 and Vice-President from 1958–1959.

Jaeger was born in Sydney in 1907 and began his studies at the University of Sydney at just 16, first in the Faculty of Engineering and then Science. He achieved first class honours and university medals in mathematics and physics and was awarded the Barker Graduate Scholarship in 1928. This led him to further studies in mathematics and theoretical physics at the University of Cambridge.

In 1936, Jaeger took up a lecturer position in mathematics at the University of Tasmania. During the Second World War, he worked on two main projects: the properties of charcoal and the fracture of sandstone rollers used in newspaper production.

He spent the remainder of the war carrying out applied theoretical research at the Radiophysics Laboratory for CSIR, the predecessor of CSIRO, while also publishing papers on heat conduction. Following the war, Jaeger returned to the University of Tasmania as a senior lecturer.

In 1951, he was invited to take the new chair of geophysics at the Australian National University, the first of its kind at an Australian university. Jaeger was instrumental in establishing laboratory-based geophysical research projects in geothermy, rock deformation and palaeomagnetism. He also established links with organisations such as the Snowy Hydro Project through his consulting activities.

During Jaeger's years at the ANU, he served on many national committees related to earth science, including the Academy's National Committee for Geodesy and Geophysics, as well as oceanography. After retirement, he returned to Tasmania, where he carried on working on publications. Jaeger died in Canberra in 1979.

See Jaeger's full biographical memoir⁶³

In addition to the Shine Dome, the Academy commemorates Jaeger's research achievements through the **Jaeger Medal**⁶⁴. The medal is awarded annually for contributions to the science of the Earth and its oceans.

Science policy update—July 2020

July 30, 2020



A new book tells the story of Kosciuszko National Park. Photo: Mcclelclj, CC BY-SA 4.0

Bushfires, COVID-19 and Kosciuszko

Professor David Lindenmayer AO FAA and Professor Chris Dickman FAA appeared before the Senate Finance and Public Administration References Committee on 29 July in relation to the Academy's submission to the **Inquiry into lessons to be learned in relation to the Australian bushfire season 2019–20**⁶⁵.

The Academy continues to provide rapid responses for the Rapid Research Information Forum (RRIF) and has released two more updates: **the most promising therapeutics for COVID-19**⁶⁶ (led by the Australian Academy of Health and Medical Sciences) and **the most promising vaccines for COVID-19**⁶⁷.

In May, Dr Graeme Worboys launched the book **Kosciuszko: A Great National Park**⁶⁸, which examines the history of the Snowy Mountains. It tells the story of how Kosciuszko National Park,

63 science.org.au/fellowship/fellows/biographical-memoirs/john-conrad-jaeger-1907-1979

64 science.org.au/supporting-science/awards-and-opportunities/jaeger-medal

65 science.org.au/supporting-science/science-policy-and-analysis/submissions-government/submission-lessons-be-learned

66 science.org.au/covid19/promising-therapeutics

67 science.org.au/covid19/promising-vaccines

68 envirobook.com.au

against the odds, was established and protected for all Australians to enjoy. Dr Worboys facilitated **Feral Horse Impacts: The Kosciuszko Science Conference**⁶⁹, held at the Academy in November 2018 on behalf of the Academy and the Australian National University Fenner School.

Other policy-related stories covered in this newsletter include:

- **Leading scientists to give evidence to Senate inquiry into Australia's unprecedented bushfires**⁷⁰
- **More work crucial to help our soil recover from bushfires**⁷¹
- **Fellow's donation set to change the lives of upcoming scientists**⁷²

Philanthropy and partnerships update—July 2012

July 30, 2020



From the archives: Voyage of the Nimrod, Leo Arthur Cotton, 1908–1912.

Support for the archives

The Academy's manuscripts collection was established in 1962, and manuscript or archival collections have since been donated to the Fenner Archives by numerous Fellows, other prominent scientists and scientific organisations.

The 233 manuscript collections of Fellows and other leading scientists, in particular, are valuable original sources of information on the history of Australian science.

The Academy's digitisation and digital access project has recently received support from a number of donors, and we are very grateful for these contributions. Their contributions have aided the digitisation of archival material from the Nimrod British Antarctic Expedition (1907–9), documented by Australian geologist Leo Arthur Cotton, who travelled to Antarctica for the expedition voyage. The proof-of-concept pilot project **can be viewed on eHive**⁷³.

The most recent donation to the digitisation project has been used to purchase scanning equipment essential for this project.

The digitisation project aims to preserve and make available online some of the most significant and fragile items in the collection. The purpose is to better action research requests by those unable to visit the Academy in person—the archives are currently closed to external researchers due to COVID-19 restrictions.

It is not too late to donate to this project. Donations are tax deductible and will assist with expanding the scope of material digitised. Those interested in the archives may also consider volunteering time to this project.

Donate to the digitisation of the archives⁷⁴

Work already completed in preserving and recording the collections to best practice standards will be of great future value. It aims to support knowledge of the archives and will be crucial for the digitisation project to proceed.

Fellow's generous donation for science policy internships

A generous donation by Academy Fellow Professor Michael Barber is set to make an enormous difference to the career trajectory of emerging scientists by enabling the Academy to engage two science policy interns in the coming

69 science.org.au/news-and-events/events/feral-horse-impacts-kosciuszko-science-conference

70 science.org.au/news-and-events/news-and-media-releases/leading-scientists-give-evidence-senate-inquiry-australias-bushfires

71 science.org.au/news-and-events/news-and-media-releases/more-work-crucial-help-our-soil-recover-bushfires

72 science.org.au/news-and-events/news-and-media-releases/fellows-donation-set-change-lives-upcoming-scientists

73 ehive.com/objects?query=%22+MS142+Leo+Arthur+Cotton%22

74 science.org.au/donate

months. He has also pledged a further donation for next financial year.

Read more about Professor Barber's donation⁷⁵

For more updates, visit the Philanthropy and Partnerships webpage⁷⁶

National Committees update—July 2020

July 30, 2020

Australia wins major geography congress for 2028

Melbourne will host the the 2028 International Geographical Union Congress



The International Geographical Union⁷⁷ has selected Melbourne to host the 2028 International Geographical Union (IGU) Congress. The Academy congratulates the bid organisers on their success in bringing this important meeting to Australia.

In 2018, the National Committee released the report **Geography: Shaping Australia's future**⁷⁸, outlining a unified vision for Australian geography over the next decade. Hosting the 2028 IGU Congress in Melbourne will provide an ideal forum to celebrate the achievements of the preceding decade and mark the beginning of the next.

The international meeting, normally held every two years, reflects the importance of cooperation across borders to address key global challenges such as mitigation and management of natural disasters. This is a timely and relevant challenge for many countries, including Australia.

Read more about the **diverse benefits of Australian membership of the International Science Council and international scientific unions**⁷⁹.

Winner of the Mike Smith Student Prize 2019–20



Every second year, the Academy's National Committee for History and Philosophy of Science partners with the National Museum of Australia to award the Mike Smith Student Prize. The prize rewards and recognises the work of students in the history of Australian science or Australian environmental history.

The 2019–20 winner is Karen Twigg with her essay, 'The Green Years: the role of abundant water in shaping rural women's experience in the 1950s'.

This prize is named in recognition of Australian archaeologist and National Museum Senior Research Fellow **Dr Mike Smith**⁸⁰, a well-known leader of his field and mentor of young researchers. The judges encourage those considering entering the 2021–22 competition to consider events happening now: how have Australian scientists handled epidemics in the past?

More information about the Mike Smith Student Prize⁸¹

Education update—July 2020

July 30, 2020

Education programs respond to COVID-19 with new and improved resources

In response to the COVID-19 pandemic and the changing nature of schooling during this period,

⁷⁵ science.org.au/news-and-events/news-and-media-releases/fellows-donation-set-change-lives-upcoming-scientists

⁷⁶ science.org.au/about-us/philanthropy-and-partnerships

⁷⁷ igu-online.org

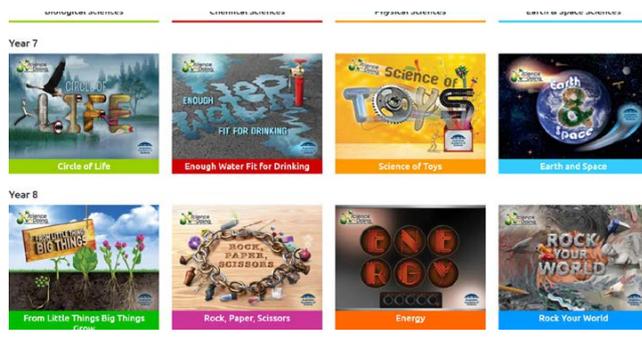
⁷⁸ science.org.au/supporting-science/science-policy-and-sector-analysis/reports-and-publications/geography-shaping

⁷⁹ science.org.au/supporting-science/international-representation/australias-engagement-international-science-council

⁸⁰ researchers.anu.edu.au/researchers/smith-m

⁸¹ science.org.au/supporting-science/national-committees-science/national-committee-history-and-philosophy-science-0

the Academy continues to provide additional assistance to schools, teachers and families. Following on from the **April 2020 education update**⁸², we have been working to customise our Australian Curriculum-linked Foundation to Year 10 science and mathematics education programs. Our education programs, **Primary Connections**⁸³ (primary science), **Science by Doing**⁸⁴ (secondary science) and **reSolve**⁸⁵ (F-10 maths), continue to assist teachers and families with increased demand for online resources.



Science by Doing resources had been successfully used for remote learning before the pandemic so the Academy produced a starter's guide for teachers new to remote learning.

The programs have implemented several measures in response to feedback from users. Primary Connections has produced **new resources**⁸⁶ to support teachers and families as well as a new online professional learning course. Science by Doing reached out to distance education teachers who had successfully used Science by Doing for remote learning before the pandemic and produced a starter's guide, including supporting videos, for teachers new to remote learning. reSolve worked with the New South Wales Department of Education, reSolve Champions and wider networks to help teachers to access and use reSolve resources, including those housed on the **NSW Department of Education website**⁸⁷.

Program uptake and feedback

The Academy has been tracking how our program resources are used throughout the year. The numbers of users accessing the Academy's education websites showed an increase over the first half of this year compared to the same period last year, and the total number of resources downloaded for all three programs has also increased.



Primary Connections curriculum units provide an exemplary, inquiry learning sequence which, when brought to life by teachers, engage students through hands-on activities.

Referrals to our websites have increased, most notably from state education departments including New South Wales, Victoria, South Australia, Western Australia and Tasmania, confirming our role as a trusted contributor to science and mathematics education. There has also been a significant increase in social media interactions.

While demand for all program resources has been high, one of Primary Connections' COVID-19 resources, **Science for families**⁸⁸, quickly became the most downloaded resource following its release in April. The well-received **professional learning course**⁸⁹, 'Create a design brief with Primary Connections' was extended by three months to allow greater uptake.

The resources have had excellent feedback from teachers, including:

- "Thank you, these [Primary Connections] resources enabled us to keep the students motivated with their learning throughout this difficult time."
- "Science by Doing is an excellent resource for schools to adopt. It is aligned with the Australian Curriculum and has tasks that

⁸² science.org.au/academy-newsletter/apr-2020-137/academy-extends-support-school-education

⁸³ primaryconnections.org.au

⁸⁴ sciencebydoing.edu.au

⁸⁵ resolve.edu.au

⁸⁶ primaryconnections.org.au/covid-19-response

⁸⁷ education.nsw.gov.au/teaching-and-learning/learning-from-home/teaching-at-home/teaching-and-learning-resources/planning-and-programming/k-6-support

⁸⁸ primaryconnections.org.au/science-families-mini-explorations

⁸⁹ primaryconnections.org.au/professional-learning

engage students and teachers alike. It is also a very useful platform to help deliver content during this time of online learning.”

As the uncertainty of COVID-19 continues, the Academy will keep reaching out to teachers and other education stakeholders. We want to ensure we provide practical, engaging content and assistance for these audiences while they manage at-home learning and beyond.

ASERA conference: Supporting teachers throughout their careers

For the first time in its 51-year history, this year’s **Australian Science Education Research Association Conference**⁹⁰ was held online. Academics and educational professionals gathered online to watch and discuss more than 120 papers and posters in late June.

The Academy presented two papers at the conference: **How might we enable generalist teachers to become confident science and STEM practitioners?**⁹¹ and **Enhancing STEM understanding for pre-service teachers**⁹².

Opportunities for scientists—July 2020

July 30, 2020

External awards

2021 Australian of the Year Awards

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

Applications close 31 July 2020

More information on the 2021 Australian of the Year Awards⁹³

The Abel Prize

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

Applications close 15 September 2020

More information on the Abel Prize⁹⁴

Lurie Prize in the Biomedical Sciences

Recognises outstanding achievements by emerging biomedical research scientists—US\$100,000

Applications close 16 September 2020

More information on the Lurie Prize in Biomedical Sciences⁹⁵

Wolf Prize

Nomination for the Wolf Prize is by invitation only. It is awarded to outstanding scientists for their achievements for the benefit of mankind in the following fields in 2021: Chemistry, Physics and Medicine—US\$100,000 in each prize area

Applications close 30 September 2020

More information on the Wolf Prize⁹⁶

See more external awards and prizes⁹⁷

Fellows update—July 2020

July 30, 2020

Honours and awards to Fellows

Four Academy Fellows are among the 2020 Australian Research Council (ARC) Australian Laureate Fellows. The ARC Fellowship scheme funds world-class endeavours in both basic and

90 asera.org.au/conferences/2020-conference

91 youtu.be/1pPYgBvDXnc

92 youtu.be/K3yi-_2_JFs

93 australianoftheyear.org.au

94 abelprize.no/c53676/artikkel/vis.html?tid=53705

95 fnih.org/what-we-do/programs/lurie-prize-recipient

96 wolffund.org.il/index.php

97 science.org.au/supporting-science/recognition/external-sources-recognition

applied research and supports the appointment of early-career researchers. The Fellowships have been awarded to the research leaders for the following projects in priority areas of national interest:

Professor Martina Stenzel FAA will develop a toolset that allows the design of small nanoparticles that display enhanced biological activity for applications in nanomedicine, catalysis and sensors.

Professor Toby Walsh FAA will work on building fairer, more efficient and trustworthy AI systems to improve the competitiveness of Australian businesses and the delivery of health services.

Professor David James FAA will dissect how genes interact with the environment to better understand the ageing process and lay the foundation for personalised health strategies.

Professor Harvey Millar FAA will study processes and genes that regulate degradation of proteins in wheat and barley plants to benefit Australia's grain industries. Professor Millar was elected a Fellow of the Academy this year.

Find out more about the Academy's ARC Laureate Fellows⁹⁸

- **Professor David Balding FAA**, Professor of Statistical Genetics, The University of Melbourne
- **Tim Game SC**, Senior Counsel Forbes Chambers, Principal Practice in Criminal Law Professor
- **Professor Carola Vinuesa FAA**, Professor of Immunology and Co-Director, Centre for Personalised Immunology, Australian National University

Event details

Date: Wednesday 19 August 2020, 5.00 pm – 6.15 pm

Venue: Online via Zoom. Link provided prior to the event

Cost: Free

Please register by 14 August.

Visit the **AAL website**⁹⁹ or email **AALSecretariat@academyoflaw.org.au** for more information.

Coming online events

The reception, quality and evaluation of scientific evidence in Australian courts (online)

A panel of experts on science and law will be questioned by The Hon Justice Virginia Bell of the High Court of Australia on the topic of scientific proof and legal proof.

Moderator

- **The Hon Justice Virginia Bell AC**, Judge of the High Court of Australia

The panel

- **The Hon Justice Mark Weinberg AO QC**, Reserve Judge of the Supreme Court of Victoria and Formerly a Judge of the Federal Court of Australia

⁹⁸ science.org.au/news-and-events/news-and-media-releases/academy-fellows-awarded-australian-laureate-fellowships

⁹⁹ australianacademyoflaw.wildapricot.org/events