

AUGUST 2020

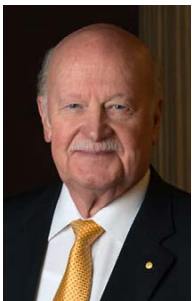
# NEWSLETTER

NUMBER 141



## Message from the President—August 2020

August 31, 2020



August is synonymous with National Science Week and the restrictions around COVID-19 didn't dampen the enthusiasm of participating organisations. There were more than 1200 National Science Week events across Australia, with the Academy providing

valuable and intriguing online opportunities which anyone could attend. With science so much in the news this year it was a chance to celebrate achievements and to inspire people of any age to think more about the value of science in our lives.

Our joint event with the Australian Academy of Law on the reception, quality and evaluation of scientific evidence in Australian courts was no exception. What would normally have been an in-person event in Sydney with limited seating was instead broadcast as a webinar and livestreamed on Facebook, with a video published on our website for future reference. We estimate close to 600 people have so far watched the event, which is many more than would have been

possible in person and illustrated the depth of interest in the topic.

Two other Academy webinars explored innovations relating to the management of oceans and bushfires, both of which received strong interest. We published written features on the inspirational work of three Fellows, promoted our 'spot the maths' photo competition for school students, and in a first for the Academy worked with Defence Science and Technology on a series of videos aimed at encouraging students to study STEM subjects.

Our involvement in the response to COVID-19 continues. Earlier in August, the Early- and Mid-Career Researcher (EMCR) Forum published a survey indicating that COVID-19 restrictions are having significant effects on the mental health and work of EMCRs and will likely have a lasting impact on their research careers and wellbeing. The EMCR Forum is calling for employers, governments and funding bodies to support our future science leaders—a call the Academy strongly supports .

The newsletter contains more about this issue and our National Science Week activities, as well as other news. Thank you for taking time out to engage with the Academy's activities.

**John Shine**



Photo by Shopify Partners from Burst

## Early- and mid-career researchers fear their careers are at risk due to pandemic

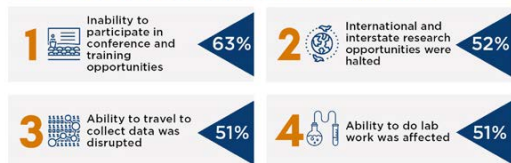
August 12, 2020

A new survey looking at the impact of COVID-19 on Australia’s early- and mid-career researcher (EMCR) workforce has found significant effects on their mental health and productivity.

The results have prompted a call for employers, governments and funding bodies to take action to support Australia’s future science leaders during this crucial time.

The nationally representative survey of 333 EMCRs was conducted by the Australian Academy of Science’s Early- and Mid-Career Researcher (EMCR) Forum.

### TOP 4 DISRUPTIONS TO WORK



The survey found increased anxiety and strains on mental health due to employment uncertainty, the need to manage competing priorities such as caring duties, changes in the workplace, and perceived loss of career prospects. It also found COVID-19 is likely to have a lasting impact on the careers and wellbeing of much of the workforce.

The report’s recommendations for government include extending JobKeeper to the university sector and other STEM employers currently ineligible.

Associate Professor Michael Bowen, Chair of the EMCR Forum.  
Photo: supplied.



The survey found the shift in workloads for EMCRs poses serious challenges for universities on how they evaluate staff for internal promotions, with many early-career researchers facing disrupted track records. Survey respondents reported research activities being replaced with more teaching and administrative tasks.

The survey also found female EMCRs with caring responsibilities and those who reduced their working hours were most affected by the pandemic.

Associate Professor Michael Bowen, Chair of the EMCR Forum, said EMCRs are the lifeblood of Australia’s STEM sector.

“This sector is critical to our nation’s current and future prosperity so it is essential that government, employers and funding bodies work together to prevent the loss of a generation of EMCRs and irreparable damage to the sector,” Associate Professor Bowen said.



Associate Professor Vanessa Wong, Co-Deputy Chair of the EMCR Forum. Photo: supplied.

With over half of all surveyed researchers funded by external funding bodies, the report also recommends guidelines be put in place for assessors of research funding applications, so the impact of COVID-19 can be properly considered.

“The COVID-19 pandemic will have significant and long-lasting effects on early- and mid-career researchers now, and into the future,” said Associate Professor Vanessa Wong, Co-Deputy Chair of the EMCR Forum.

“Without rapid and continued support by government, employers and funding bodies, there will be mass exodus from STEM sectors leading to

a substantial brain drain and lost future capacity and capability to provide solutions to future challenges, such as the next pandemic.”

The survey follows the publication of a **report by the Rapid Research Information Forum**<sup>1</sup> in May which also found that women and early-career researchers are among those that will disproportionately experience negative impacts of the pandemic.

**Read the full survey report and recommendations.**<sup>2</sup>

## A year of championing the vision for women in STEM

August 28, 2020



Organisations from across the STEM sector coming together to progress the Women in STEM Decadal Plan.

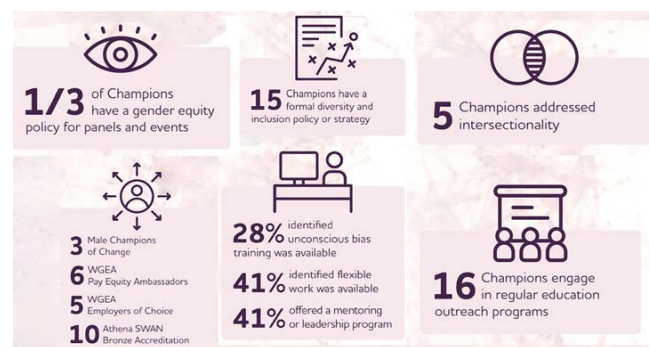
In just one year, 29 Champions have led the way by affirming their commitment to the vision of the Women in STEM Decadal Plan. The national vision aims to establish a thriving STEM-skilled workforce that is fit for the future, globally recognised, powered by a diverse and gender-balanced pipeline, and supported by an inclusive and respectful workplace culture.

The Women in STEM Decadal Plan Champions initiative was launched in August 2019, encouraging all organisations across the STEM sector to submit responses aligning their gender equity activities with the six opportunities outlined in the Women in STEM Decadal Plan. Champions’ responses are **publicly available on the Women in STEM website**<sup>3</sup>.

A report prepared by the Academy, **One Year In—Women in STEM Decadal Plan Champions**<sup>4</sup>, analyses the gender equity activities highlighted by Champions and key stakeholders over the past year and defines the next steps to improving gender equity.

This analysis has identified areas of positive action and increased focus for Champions. The information is important for the STEM sector as it enters the second year of implementing the decadal plan.

Findings in the report illustrate that while there has been positive action in many areas, now is not the time to lose momentum given the **impact of COVID-19 on women in STEM**<sup>5</sup>. Substantial work is required to create systemic change across the STEM sector.



Some of the report’s key findings.

All Champions displayed visible leadership from their executive teams and demonstrated efforts to improve the visibility of women in STEM roles. All have adopted various forms of inclusive workplace practices such as flexible work, generous paid parental leave policies, domestic violence leave and unconscious bias training.

Intersectionality—which looks at how a person’s social and political identities may combine to create unique situations of privilege or discrimination—was identified as an area with minimal focus. This will be of interest to the STEM sector as emerging research identifies intersectionality as an area of growing knowledge and action.

1 [www.science.org.au/covid19/research-workforce](http://www.science.org.au/covid19/research-workforce)

2 [www.science.org.au/supporting-science/early-and-mid-career-researchers-0/emcrs/emcr-forum-resources](http://www.science.org.au/supporting-science/early-and-mid-career-researchers-0/emcrs/emcr-forum-resources)

3 [www.stemwomen.org.au/champions](http://www.stemwomen.org.au/champions)

4 [www.stemwomen.org.au/sites/default/files/inline-files/WISDP\\_Champions\\_Report.pdf](http://www.stemwomen.org.au/sites/default/files/inline-files/WISDP_Champions_Report.pdf)

5 [www.science.org.au/covid19/women-stem-workforce](http://www.science.org.au/covid19/women-stem-workforce)



The Academy continues to welcome new Champion responses and encourages all STEM organisations to share their actions and learnings to show their support for a fair and equitable STEM sector.

Find out how to become a Champion<sup>6</sup>

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## Essay on how water shaped rural women's experience wins Mike Smith Student Prize

August 11, 2020



Karen Twigg's background growing up on a farm underpins her interest in the historical experience of rural women.

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Karen Twigg has won the **2019-20 Mike Smith Student Prize**<sup>7</sup> with an essay

exploring how water availability shaped women's experience in rural Australia in the 1950s.

Ms Twigg's work was commended for its creative topic, strong analysis and skilled presentation. "All credit goes to Joan [Bennet née Corbett], a deeply reflective and eloquent rural woman, whose experience forms the central focus of my essay," she said.

"My own background growing up as one of three daughters on a farm in rural Victoria underpins my interest in the historical experience of rural women."

With a first prize award of \$3000, the Mike Smith Student Prize recognises the work of students in the history of Australian science or Australian environmental history. It is awarded by the Academy's **National Committee for History and Philosophy of Science**<sup>8</sup> in partnership with the **National Museum of Australia**<sup>9</sup> once every two years. The judging panel also includes an Editor

of the Academy's journal, **Historical Records of Australian Science**<sup>10</sup>.

"I am in awe of Dr Mike Smith's work and his skill in integrating archaeological and environmental material, so winning the prize that bears his name is very significant," Ms Twigg said.

"The award has also encouraged me to continue to explore gender assumptions and how they shape the ways in which the environment was experienced, imagined and changed."

Due to COVID-19 restrictions, Ms Twigg could not be presented with her award at a conference. It is hoped that her award may be presented at a future event. Her essay may be published in a book or journal in the future.

The judges of this competition thank all those who submitted essays to the 2019–20 Mike Smith Student Prize. Entries for the next round will open in late 2021.

Students thinking of preparing an entry for the next Mike Smith Student Prize may like to consider the events of 2020. How have Australian scientists handled epidemics in the past?

However, the judges will welcome any topic in the history of Australian science and in Australian environmental history.

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## Academy collaborations supporting the school education community

August 28, 2020

In the rapidly changing environment of COVID-19, the Academy's education programs are focusing on collaborating with other organisations to maximise reach and impact.

The **Academy's programs**<sup>11</sup> have been connecting within and across the education community to share their freely available resources and to show how they can be

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6 [www.science.org.au/support/analysis/decadal-plans-science/women-in-stem-decadal-plan/become-women-stem-decadal-plan](http://www.science.org.au/support/analysis/decadal-plans-science/women-in-stem-decadal-plan/become-women-stem-decadal-plan)

7 [www.science.org.au/supporting-science/awards-and-opportunities/mike-smith-student-prize-history-australian-science-or-australian-environmental-history](http://www.science.org.au/supporting-science/awards-and-opportunities/mike-smith-student-prize-history-australian-science-or-australian-environmental-history)

8 [www.science.org.au/supporting-science/national-committees-science/national-committee-history-and-philosophy-science](http://www.science.org.au/supporting-science/national-committees-science/national-committee-history-and-philosophy-science)

9 [www.nma.gov.au/](http://www.nma.gov.au/)

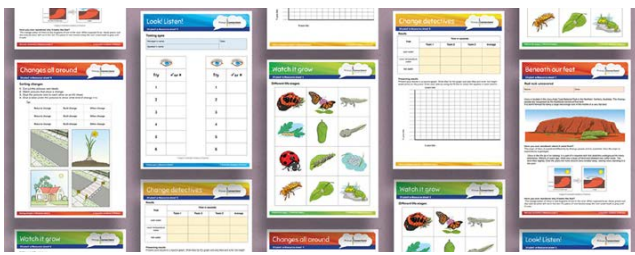
10 [www.publish.csiro.au/hr](http://www.publish.csiro.au/hr)

11 [www.science.org.au/education/academy-school-education-programs](http://www.science.org.au/education/academy-school-education-programs)

adapted and utilised for situations including remote learning.

“Working with others during COVID-19 means that support can be deeper and richer for teachers, meeting them where they are in the midst of upheaval and uncertainty,” said the Academy’s Director of Education, Claudette Bateup.

With remote delivery currently a feature of education activities, including teacher professional learning, the Academy’s programs have featured in two recent webinars for teachers: one by industry organisation the Australian Computer Society, and another by the professional association Digital Learning and Teaching Victoria.



Academy education resources are available online, including e-Resource sheets for all Primary Connections units.

## Creating a Digital Technologies scope and sequence

### Australian Computer Society Virtual Development Series

The Australian Computer Society (ACS) developed its Virtual Development Series to assist teachers when they moved to online learning, with the aim that teachers across Australia felt supported and aware there were experts and professionals they could turn to for advice.

In June, one of the webinars in the ACS series featured the Academy’s Primary Connections program.

“The ACS wanted to partner with the Academy to demonstrate to teachers the connections between the Australian Curriculum Digital Technologies and the Australian Curriculum Science,” said ACS ICT Educator Specialist, Catherine Newington.

“The joint webinar allowed teachers to see how they can integrate different learning areas within one lesson. The aim was to show teachers how one lesson could support learning across more than one curriculum area and to help planning lessons, assessment and reporting.”

**Watch the webinar: Creating a Digital Technologies scope and sequence (ACS)<sup>12</sup>**

## Exploring maths and science resources with the Academy

### Digital Learning and Teaching Victoria

Another group responding promptly to the COVID restrictions by offering webinars for educators was the professional association Digital Learning and Teaching Victoria (DLTV). With its usual face-to-face professional learning workshops and events not possible since March, DLTV was keen to serve educators and its members in another relevant way.

“In this time of COVID and lockdowns, many of our webinars have focused on online resources available to teachers, particularly when remote and flexible learning is such a priority,” explained DLTV Professional Learning Coordinator Nathan Alison.

DLTV recently collaborated with the Academy to highlight our digital education resources. “As part of the STEM grouping, maths and science resources have a particularly strong connection to digital technologies. The Academy’s resources have a strong emphasis on students gaining understanding through doing. This is something they have in common with several Digital Technologies skills such as computational thinking.”

**Watch the webinar: Explore maths and science resources with the Australian Academy of Science (DLTV)<sup>13</sup>**

<sup>12</sup> [www.acs.org.au/ict-educators-development/2020-06-10-creating-a-digital-technologies-scope-and-sequence.html](http://www.acs.org.au/ict-educators-development/2020-06-10-creating-a-digital-technologies-scope-and-sequence.html)

<sup>13</sup> [dltv.vic.edu.au/event-3885871](http://dltv.vic.edu.au/event-3885871)

# Citizen science and leadership training among events to inspire and support EMCRs

August 28, 2020



Early- and mid-career researchers participating in the 2019 Re:Produce workshop, a Theo Murphy Initiative (Australia) event

Citizen science, collaboration with Japan, measuring success and training future leaders are events aimed at building the skills of early- and mid-career researchers over the next 12 months.

Each year the **Theo Murphy Initiative (Australia)**<sup>14</sup>, through the Academy, supports the delivery of EMCR activities designed to provide tangible career benefits for EMCRs in Australia. This year is no different—despite the considerable impacts of COVID-19 and the additional challenges and restrictions for event planning, four EMCR events will be delivered in the 2020–21 round.

All four events will plan for the possibility of partially or fully virtual online delivery. Despite the complicated nature of organising events in a COVID and post-COVID world, the successful applicants are planning innovative solutions for virtual attendance. This pragmatic problem-solving demonstrates the EMCR community's capacity to adapt and devise accessible and inclusive solutions.

The four successful proposals funded this year are:

- **Enhancing connections between early- and mid-career researchers and citizen science to inspire, impact and influence**—a series of online opportunities for EMCRs interested in the Australian citizen science sector and advancing citizen science in Australia.

These EMCR events will be delivered in the lead-up to the Australian Citizen Science conference in 2021

- **Japan Connect/JSPSAAA symposium**—a symposium aimed at connecting EMCRs in Australia with past, present, and possible future collaborative links with Japan
- **Moving beyond metrics**—a think tank designed to develop recommendations to modernise the metrics of success for the Australian research sector
- **Training the future leaders of research**—a three-day workshop for early-career researchers to introduce, develop and refine the skills required to promote their careers and provide direction in their journeys as future leaders in science.

The Theo Murphy (Australia) Fund was established with the purpose of furthering scientific discovery in the fields of medicine, science, technology and engineering. The fund is made available by the Royal Society of London and administered by the Academy.

To receive updates about the current Theo Murphy Initiative (Australia) activities and information about future funding rounds, **join the EMCR Forum mailing list**<sup>15</sup> today.

## The intersection of scientific and legal proof draws a big audience

August 27, 2020

The Australian Academy of Science and the Australian Academy of Law jointly sponsored a symposium on the reception, quality and evaluation of scientific evidence in Australian courts during National Science Week.

The online event was moderated by the Hon Justice Virginia Bell AC, Judge of the High Court of Australia, and drew an estimated audience of around 600. It was the third year the two academies have held a joint event and the first time it was held fully online.

The panel eminent panel members were:

<sup>14</sup> [www.science.org.au/news-and-events/events/theo-murphy-initiative-australia](http://www.science.org.au/news-and-events/events/theo-murphy-initiative-australia)

<sup>15</sup> [www.science.org.au/supporting-science/early-and-mid-career-researchers-0/emcrs/emcr-membership-registration](http://www.science.org.au/supporting-science/early-and-mid-career-researchers-0/emcrs/emcr-membership-registration)

- 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
- Professor David Balding FAA, Professor of Statistical Genetics, 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.

“There’s clearly an appetite for these events that reaches around Australia and the globe, and the volume of registrations for tonight demonstrates a real appetite to continue this collaboration between the two academies,” said the President of the Australian Academy of Science, Professor John Shine.

“It’s at that intersection of the Academy of Science and the Academy of Law where I think a lot of very important issues arise and can be constructively discussed with society. And we certainly won’t let this pandemic slow us down in that respect.”



The reception, quality and evaluation of scientific evidence in Australian courts - Watch on Facebook<sup>16</sup>

## Celebrating stories of science for National Science Week

August 14, 2020



Some of the Science Activity Characters developed for National Science Week.

Who do you see when you look at this image above?

These Science Activity Characters show people engaging with a range of science-related activities. Last year, the Academy worked with the National Science Week team to share real stories of Australian science to bring these characters to life. For National Science Week this year there are three new stories to explore. What better time is there to celebrate the work of our Fellows?

### Lifelong passion

There’s never a dull moment when you **work as a marine biologist**<sup>17</sup>. You might come face-to-face with an octopus, a seal, a dolphin—or maybe a predatory sea star that can destroy our coral reefs. Professor Maria Byrne followed a lifelong passion for exploring the underwater world and applies her in-depth knowledge of sea stars to find better ways to manage crown-of-thorns starfish.

“I wanted to know what made animals tick, why animals are where they are in the world, and how did they get there?” said Professor Byrne.

What questions do you ask whenever you gaze up at the stars in the night sky? There aren’t too many questions more fundamental to our existence than ‘how did the Universe

<sup>16</sup> [www.facebook.com/watch/?ref=external&v=942223116297267](https://www.facebook.com/watch/?ref=external&v=942223116297267)

<sup>17</sup> [www.science.org.au/curious/earth-environment/super-stars-sea](http://www.science.org.au/curious/earth-environment/super-stars-sea)



begin?'. Professor Rachel Webster explores how **astrophysicists can get precious glimpses**<sup>18</sup> of our early Universe by peering around galaxies, inside black holes and back through time itself.

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Academy Fellows featuring in National Science Week include (from top) Professor Maria Byrne, Professor Rachel Webster and Professor John Endler.

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Professor Webster was inspired to delve a lot deeper into the Universe after “accidentally” attending a lecture on cosmology at the University of Sydney one summer, saying “it blew my 17-year-old brain out of the water.”

How do birds see the world—and how do we know? Understanding **what a bird’s eye view really looks like**<sup>19</sup> helps us understand why different animals perceive the world in different ways. Professor John Endler specialises in understanding the visual systems of birds, and how some of them can even create visual illusions.

Professor Endler said his path to studying animal vision was initially triggered by “pure curiosity. I was curious about the why, rather than just the usual who, what, where and how. What are the animals trying to do, and why?”

You can also explore the **ethics of artificial intelligence**<sup>20</sup>, how **bees help us design better drones**<sup>21</sup>, and how **virtual reality helps environmental conservation**<sup>22</sup>.

## How will you science this National Science Week?

Share your own stories on social media with the #ScienceWeek, #SolveItWithSTEM and/or #STEMsavinglives hashtags and tell us how you use STEM to solve problems or who in STEM



inspires you. Make sure to tag National Science Week (@Aus\_ScienceWeek) and the Academy (@Science\_Academy) so we can hear from you!

Find out more about the Academy’s activities in National Science Week.<sup>23</sup>

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## Oceans and bushfire events feature in National Science Week

August 27, 2020

Oceans and bushfires were the focus of two National Science Week events this month, with the Academy hosting webinars which explored how science can help us improve the health of our oceans and manage bushfires. We thank the experts involved, and all those who joined us online.

### Innovations to save our oceans



Innovations to save our oceans - Watch on Facebook<sup>24</sup>

On Monday evening over a live webinar, an expert panel discussed the issues affecting our oceans and provided tangible solutions. We were joined by Academy Fellow Professor Ove Hoegh-Guldberg from the University of Queensland, Jemma Purandare from Griffith University and Dr Beth Fulton from CSIRO Oceans and Atmosphere.

Climate change and ocean warming, biodiversity loss, and marine pollution were just some of

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18 [www.science.org.au/curious/space-time/glimpses-early-universe](http://www.science.org.au/curious/space-time/glimpses-early-universe)

19 [www.science.org.au/curious/earth-environment/getting-birds-eye-view](http://www.science.org.au/curious/earth-environment/getting-birds-eye-view)

20 [www.science.org.au/curious/technology-future/ai-and-robotics-revolution](http://www.science.org.au/curious/technology-future/ai-and-robotics-revolution)

21 [www.science.org.au/curious/earth-environment/birds-and-bees-and-drones](http://www.science.org.au/curious/earth-environment/birds-and-bees-and-drones)

22 [www.science.org.au/curious/technology-future/saving-big-cats-vr-and-clever-stats](http://www.science.org.au/curious/technology-future/saving-big-cats-vr-and-clever-stats)

23 [www.science.org.au/news-and-events/news-and-media-releases/academy-gears-national-science-week](http://www.science.org.au/news-and-events/news-and-media-releases/academy-gears-national-science-week)

24 [www.facebook.com/watch/?ref=external&v=3184175924952444](https://www.facebook.com/watch/?ref=external&v=3184175924952444)

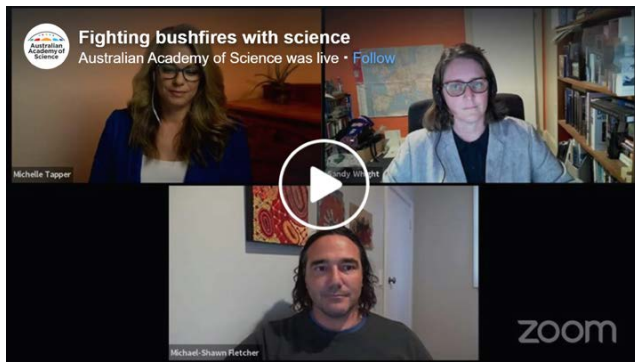


the problems that were discussed in the panel discussion and the following Q&A.

The panellists emphasised that there are individual actions that people can take, such as sorting recycling well and eating sustainably-produced seafood, but there are also technologies that can be harnessed better, such as on-water solar and wind power for renewable energy.

The event made it clear that we have an opportunity during the economic recovery post-COVID-19 to invest in the infrastructure and technologies for our future, rather than in old, emissions-heavy projects.

## Fighting bushfires with science



Fighting bushfires with science - Watch on Facebook<sup>25</sup>

On Thursday of National Science Week we were joined by Sandra Whight, an ecologist with more than 25 years' experience as a firefighter and operational decision-maker and now with the Bureau of Meteorology, along with Associate Professor Michael-Shawn Fletcher, an Indigenous scientist at the University of Melbourne who specialises in fire ecology, climatology and geology.

The two experts discussed technologies such as satellite imagery and helicopter 'water bombs', the impact of severe fires on local ecosystems, and how we can continue to improve fire management systems.

While short-term predictions are hard to make, Ms Whight said that Australians need to understand

that fire is part of our lives and land, but we need to work together to understand and respond to extreme catastrophic fire conditions.

Associate Professor Fletcher emphasised the need to make use of the scientific and cultural toolkits available to prepare for the dire predictions for future fire seasons across Australia and the globe.

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## Academy celebrates the value of science with satellite selfie

August 18, 2020



This message can be seen from space! While the satellite images will not be made available until after the final flyover, Monday's action was captured by a drone flying a little closer to the ground.

The Academy has created a message that can be seen from space to highlight the important role of scientists as the world navigates the COVID-19 pandemic and beyond.

'Science will solve this' is being created during **National Science Week**<sup>26</sup> as part of Inspiring the ACT's **'Satellite Selfie'**<sup>27</sup>. The message symbolises the Academy's commitment to support the nation by **providing the latest evidence from experts on COVID-19**<sup>28</sup>. In June, the Academy was **named in the top 10**<sup>29</sup> most prominent sources of information during the pandemic by the **Australian Science Media Centre**<sup>30</sup>. Academy Fellows

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<sup>25</sup> [www.facebook.com/watch/?ref=external&v=2244945418985364](https://www.facebook.com/watch/?ref=external&v=2244945418985364)

<sup>26</sup> [www.scienceweek.net.au/](http://www.scienceweek.net.au/)

<sup>27</sup> [inspiringtheact.org.au/satellite-selfie/](http://inspiringtheact.org.au/satellite-selfie/)

<sup>28</sup> [www.science.org.au/covid19/news-and-resources](http://www.science.org.au/covid19/news-and-resources)

<sup>29</sup> [www.science.org.au/news-and-events/academy-top-resource-covid-19-knowledge](http://www.science.org.au/news-and-events/academy-top-resource-covid-19-knowledge)

<sup>30</sup> [www.smc.org.au/](http://www.smc.org.au/)

have been highly sought after for comment by the media.

Using a satellite 770 kilometres above Earth, the project has given the ACT, its surrounds and the Northern Territory the unusual opportunity to take part in a massive selfie. Three planned flyovers across the week give participants the best chance to have their creations captured by the satellite.

ANU astrophysicist Dr Brad Tucker said the images would form the “ultimate, out of this world, selfie”.

“Nothing to this scale and this many people has ever been tried before in the world, let alone Australia. We are going to use a satellite to take a massive selfie that shows what Canberra, its surrounds and the NT looked like in August 2020,” Dr Tucker said.

The message symbolises the Academy’s commitment to support the nation by providing the latest evidence from experts on COVID-19.

Careful planning is required to make a design visible from that height. Each 50 cm square on the ground translates to a single pixel in the satellite image. ‘Science will solve this’ was calculated to require 276 pixels.

On the first flyover on Monday morning it took 105 towels spread across the sunny Shine Dome car park by 12 staff members to make the plan a reality. While the satellite images will not be made available until after the final flyover on Friday, Monday’s action was captured by a drone flying a little closer to the ground.

Other creative designs can be seen by searching for **#SatelliteSelfie**<sup>31</sup> on social media.

A big thank you to Accor for lending us the towels needed to share this important message in an environmentally friendly way, and to Living Simply for supplying the rocks to hold them down.

## Science policy update— August 2020

August 28, 2020

The Academy periodically sends out a **science policy and diplomacy newsletter**<sup>32</sup> for those interested in policy and international matters. The newsletter highlights important science policy discussion and events in Australia and around the globe. We report on the involvement of science in national and international policy and diplomacy, and the Academy’s contributions to these discussions. **Find out more about and subscribe to the newsletter**<sup>33</sup>.

### Bushfire expert briefs



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

The Academy has published its first two bushfire expert briefs. The expert briefs on bushfire aim to aid decision-makers, parliament, the national royal commission and the public with the delivery of scientific evidence. The first two briefs are:

- **Soil condition after bushfires**<sup>34</sup>
- **Monitoring Australia’s wildlife**<sup>35</sup>

Both briefs have been reported in the media, including by Cosmos and ABC Country Hour, which interviewed experts on soil condition. The Academy also met with parliamentarians and representatives from the Australian Government Department of Agriculture, Water and the Environment. More briefs are in the pipeline, including addressing the health impacts of bushfires.

### Submissions and government engagement

#### Great Barrier Reef

In November 2019, the Academy made a submission to a government inquiry on the

31 [www.instagram.com/explore/tags/satelliteselfie/](https://www.instagram.com/explore/tags/satelliteselfie/)

32 [www.science.org.au/news-and-events/newsletters/science-policy-and-diplomacy-newsletter](https://www.science.org.au/news-and-events/newsletters/science-policy-and-diplomacy-newsletter)

33 [www.science.org.au/news-and-events/newsletters/science-policy-and-diplomacy-newsletter](https://www.science.org.au/news-and-events/newsletters/science-policy-and-diplomacy-newsletter)

34 [www.science.org.au/supporting-science/science-policy-and-analysis/evidence-briefs/soil-condition-after-bushfires](https://www.science.org.au/supporting-science/science-policy-and-analysis/evidence-briefs/soil-condition-after-bushfires)

35 [www.science.org.au/supporting-science/science-policy-and-analysis/evidence-briefs/monitoring-wildlife-recovery](https://www.science.org.au/supporting-science/science-policy-and-analysis/evidence-briefs/monitoring-wildlife-recovery)

identification of leading practices in ensuring evidence-based regulation of farm practices that impact water quality outcomes in the Great Barrier Reef<sup>36</sup>. The submission defended the role of science in public policy, and the processes underpinning peer review and the scientific evidence base.

The Academy will continue to contribute expertise to the inquiry, including being represented at public hearings.

### Review of the EPBC Act

In June 2020 the Review of the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) released an **interim report**<sup>37</sup>. The report made recommendations for the reform of the EPBC Act, centring around the establishment of a set of National Environment Standards that a revised Act would uphold. The report picked up the Academy's **submission**<sup>38</sup> to the independent review.

The independent reviewer, Professor Graeme Samuel, has established a consultative group to advise on the requirements for the National Environment Standards. Academy Fellow Professor Craig Moritz is coordinating the Academy's input to this process, and the Academy's Secretary Biological Sciences, Professor Helene Marsh, is participating in the consultative group in her capacity as Chair of the Threatened Species Scientific Committee (TSSC), a committee under the EPBC Act.

### Government data

In August 2020, the Academy made a **submission**<sup>39</sup> to the National Archives of Australia **Consultation**<sup>40</sup> on its exposure draft for its next policy for Australian Government agencies. The policy aims to improve how Australian Government agencies create, collect, manage and use information assets. Our submission highlights the importance of access to data across sectors, obtaining accurate metadata, and storing data securely.

The submission was written with advice from the Academy's National Committee for Data in Science, Academy Fellow Professor Michael Barber, and Dr Danny Kingsley, Scholarly Communication Consultant.

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## National Committees update—August 2020

August 28, 2020

### Can you spot the maths?

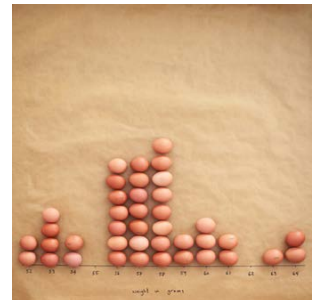
#### Eggsactly!

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Natural egg variation.  
Photo: Rebecca Herbst

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This photo by Rebecca Herbst shows natural egg variation: this sample of 40 supermarket eggs from the same brand were weighed and arranged by mass.



In a sample like this, where nature should dictate the variation in mass, we would expect to see a normal distribution that you might know as a 'bell curve'.

This is not really the case. But why do you think that is?

It could be because:

- the sample size is just not big enough. If you added another 20, 40 or even 60 eggs, this histogram might start to look more like a normal distribution
- sorting eggs to be sold has disturbed the natural variation, making it more likely for shoppers to find eggs of certain mass.

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36 [www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Rural\\_and\\_Regional\\_Affairs\\_and\\_Transport/GreatBarrierReef](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Rural_and_Regional_Affairs_and_Transport/GreatBarrierReef)

37 [epbcactreview.environment.gov.au/resources/interim-report](http://epbcactreview.environment.gov.au/resources/interim-report)

38 [www.science.org.au/supporting-science/science-policy-and-analysis/submissions-government/independent-review-epbc-act](http://www.science.org.au/supporting-science/science-policy-and-analysis/submissions-government/independent-review-epbc-act)

39 [www.science.org.au/supporting-science/science-policy-and-analysis/submissions-government/submission-national-archive](http://www.science.org.au/supporting-science/science-policy-and-analysis/submissions-government/submission-national-archive)

40 [www.naa.gov.au/information-management/have-your-say-our-next-policy-government](http://www.naa.gov.au/information-management/have-your-say-our-next-policy-government)

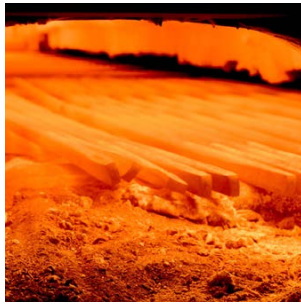


## Heat = money

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A furnace used to manufacture steel coils.  
Photo: Mark McGuinness

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This image of a furnace is by Professor Mark McGuinness, Victoria University of Wellington, New Zealand, and is an example of how maths improved an industrial process.

According to Professor McGuinness, a manufacturer of steel coils came to the Mathematics in Industry Study Group to seek help in saving on power costs. They asked for a mathematical model of the heat lost while tempering steel rods in their gas-fired furnaces.

With calculus, computer coding and “extensive use of mathematics”, Professor McGuinness and colleagues were able to help redesign the furnace entrance.

“The manufacturer gave us a glowing reference,” he says.

These images were shared on the Academy’s social media platforms during National Science Week.

## About the competition

Spot the maths is a photography competition for all school aged children, from Foundation to Year 12. To enter students are asked to spot the maths, take a photo and write a short 240-character description of the maths that they spotted!

The winning photographer in each category will receive a prize pack and a prize for their whole class! Second place photographers will receive a classroom prize pack. There is also a special prize for photographs showcasing statistics.

The Australian Academy of Science’s National Committee for Mathematical Sciences is hosting **scienceXart: spot the maths**<sup>41</sup> to recognise mathematics and its prominence in science and society. This initiative is part of the Academy’s celebration of the **International Mathematical Union’s**<sup>42</sup> Centennial held in collaboration with and supported by the **Australian Mathematical Society**<sup>43</sup> and the **Statistical Society of Australia**<sup>44</sup>.

This competition has been tailored to align with Australian curriculum learning outcomes, making it a great opportunity for learning at home or as part of an in-class project. A classroom resource on how to spot maths and ideas on how to write the description can be found **here**<sup>45</sup>.

**Find out more and to submit your scienceXart: spot the maths entry.**<sup>46</sup>

## Interested in news and opportunities for space and radio science?

The National Committee for Space and Radio Science provides updates about international scientific unions and committees, news from the local scientific community, and information on relevant funding opportunities, conferences and awards. Importantly, the update is providing a way to keep the community informed on the progress of the decadal plan for space science.

**Find out more and subscribe to the newsletter.**<sup>47</sup>

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## Archaeology, astronomy and botany feature in latest issue of journal

**August 31, 2020**

The latest issue of the Academy’s journal, **Historical Records of Australian Science**<sup>48</sup>, is now available. The journal covers a wide range of exploration, discovery, invention and progress relating to the history of pure and applied science

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41 [www.science.org.au/sciencexart/spot-the-maths](http://www.science.org.au/sciencexart/spot-the-maths)

42 [www.mathunion.org/](http://www.mathunion.org/)

43 [www.austms.org.au/](http://www.austms.org.au/)

44 [www.statsoc.org.au/](http://www.statsoc.org.au/)

45 [resolve.edu.au/spot-maths](http://resolve.edu.au/spot-maths)

46 [www.science.org.au/sciencexart/spot-the-maths](http://www.science.org.au/sciencexart/spot-the-maths)

47 [www.science.org.au/news-and-events/newsletters/space-and-radio-science-news-and-opportunities](http://www.science.org.au/news-and-events/newsletters/space-and-radio-science-news-and-opportunities)

48 [www.publish.csiro.au/hr](http://www.publish.csiro.au/hr)

in Australia, New Zealand and the southwest Pacific. It is the only journal of its kind for this region, and also publishes essays, biographical memoirs of deceased Academy Fellows, book reviews and bibliographies.

The journal's editors are Dr Sara Maroske from the Royal Botanic Gardens Victoria and Professor Ian D. Rae from the University of Melbourne. Here is their introduction to the latest issue of the journal.

## From the editors

We had planned to dedicate this issue of the journal to histories of archaeology in Australia and the Pacific, an initiative of the ARC Laureate project 'The collective biography of archaeology in the Pacific: a hidden history' but the Covid-19 virus disrupted our planning. Archaeology has its roots in the social sciences and humanities, but its emergence as a modern university discipline has been closely associated with its embrace of new technologies and scientific approaches.

In the interests of making the work available, the first two articles on the history of archaeology in Australia and New Zealand appear here, but others will be published as they are processed. They will appear online early, of course, and we will gather them into a virtual issue when the set is complete. Guest editors Hilary Howes and Matthew Spriggs have overseen the review process of these articles.

The interest shown by our contributors in the nineteenth-century work of botanists and collectors, many of them with connections to Ferdinand von Mueller, is continued with two articles about the work of John Dallachy (1804–71). Dallachy, a 'super collector', settled in the highly species diverse Wet Tropics Bioregion of north-east Queensland, during a period now known in Australian history as 'the frontier wars' when settlers clashed with Aboriginal people.

Australia's participation in scientific organisations at international level forms the background to Nick Lomb's account of how the 1973 general assembly of the International Astronomical Union came to be held in Sydney. In these times of financial stress, it is interesting to read that although Australia became an adhering country to the union in 1922, it had to withdraw during the years of the great depression due to financial exigency but was able to rejoin in 1939.

The lives and scientific careers of two Fellows of the Australian Academy of Science, David Curtis and Bruce Fraser, are described in biographical memoirs prepared by former colleagues and experts in their respective fields. Curtis was a neurophysiologist who studied the transmission of signals in the central nervous system and held senior appointments in the John Curtin School of Medical Research at ANU. Fraser was a biophysicist who worked with fibrous proteins, for most of his career in the Wool Textile Research Laboratories of CSIRO. Curtis was also a Fellow of the Royal Society, that will also publish his biographical memoir under a long-standing agreement between the two learned academies.

The eight book reviews compiled under Peter Hobbins' guidance show, as usual, the breadth of interest in Australian science, and we are pleased to note that two of the authors whose books are reviewed, John Dowe and Pete Minard, have published with us in Historical Records of Australian Science.

## Access to the journal for Academy Fellows

Fellows have free online access to all the articles in Historical Records of Australian Science. Go to the 'Fellows Only' page on the Academy website (you need to be logged in), and under the heading 'Resources and other information' click on the link to Historical Records.

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## Opportunities for scientists—August 2020

August 31, 2020

### Academy opportunity

#### Japan Society for the Promotion of Science fellowships

The JSPS Postdoctoral Fellowship Program for Foreign Researchers provides fellowships for Australian postdoctoral researchers to conduct, under the guidance of their Japanese hosts, cooperative research with leading research groups in universities and other Japanese institutions. Applications open on 31 August for 12- to 24-month fellowships to

Japan, commencing between 1 April and 30 November 2021.

#### **More information on the JSPS fellowships<sup>49</sup>**

Applications close 9 November 2020

### **External opportunity**

#### **Australian Geoscience Council Indigenous Scholarship**

The Australian Geoscience Council (AGC) Indigenous Scholarship aims to assist Indigenous undergraduate students with costs associated with their study at university. The scholarship comprises a payment of \$5000 per year, direct to the scholarship holder, until the completion of the degree and to a maximum of three years.

#### **More information on the AGC Indigenous Scholarship<sup>50</sup>**

Applications close 30 September 2020

### **External awards**

#### **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, and also applications of mathematics in the sciences—US\$1 million.

#### **More information on the Abel Prize<sup>51</sup>**

Applications close 15 September 2020

#### **Lurie Prize in the Biomedical Sciences**

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

#### **More information on the Lurie Prize in Biomedical Sciences<sup>52</sup>**

Applications close 16 September 2020

#### **Wolf Prize**

Nomination to the Wolf Prize is by invitation only. 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.

#### **More information on the Wolf Prize<sup>53</sup>**

Applications close 30 September 2020

#### **Canada Gairdner International Awards**

The Canada Gairdner International Award recognises outstanding researchers whose unique scientific contributions have increased the understanding of human biology and disease and contributed to the relief of human suffering—C\$100,000.

#### **More information on the Canada Gairdner International Awards<sup>54</sup>**

Applications close 1 October 2020

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### **See more external awards<sup>55</sup>**

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## **Fellows update—August 2020**

### **August 31, 2020**

#### **Awards to Fellows**

Professor Terence Tao FAA FRS—together with Yves Meyer, Ingrid Daubechies and Emmanuel Candès, received the Princess of Asturias Award for Technical and Scientific Research 2020 for making immeasurable, ground-breaking contributions to modern theories and techniques of mathematical data and signal processing.

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49 [www.science.org.au/supporting-science/awards-and-opportunities/japan-society-promotion-science-fellowships](http://www.science.org.au/supporting-science/awards-and-opportunities/japan-society-promotion-science-fellowships)

50 [www.agc.org.au/australian-geoscience-council-indigenous-scholarship/](http://www.agc.org.au/australian-geoscience-council-indigenous-scholarship/)

51 [www.abelprize.no/c53676/artikkel/vis.html?tid=53705](http://www.abelprize.no/c53676/artikkel/vis.html?tid=53705)

52 [fnih.org/what-we-do/programs/lurie-prize-recipient](http://fnih.org/what-we-do/programs/lurie-prize-recipient)

53 [www.wolffund.org.il/index.php](http://www.wolffund.org.il/index.php)

54 [gairdner.org/awards/international-awards/](http://gairdner.org/awards/international-awards/)

55 [www.science.org.au/supporting-science/recognition/external-sources-recognition](http://www.science.org.au/supporting-science/recognition/external-sources-recognition)



## Obituary

### Emeritus Professor Richard Limon Stanton AO FAA DistFRSN

16 February 1926 to 25 August 2020

Emeritus Professor Richard Stanton AO  
FAA DistFRSN



Professor Richard Stanton was an eminent economic geologist, elected to the Academy in 1975 for his original contributions to the genesis of ore deposits. He recognised the role of volcanism and sedimentation in the formation of new ore deposits, and the physics and chemistry involved in the concentration of copper, zinc and lead in volcanic lavas.

After completing his BSc at New England University College, University of Sydney (later University of New England), Professor Stanton worked in mineral exploration in mines at Broken Hill, far north Queensland and Burruga. He then took up a teaching fellowship at the University of Sydney where he completed his PhD on regional patterns of mineralisation and was involved in the first systematic geological mapping of the Solomon Islands. In 1975, following a post-doctorate Fellowship at Queen's University, Ontario, he was appointed Professor of Geology at the University of New England and then Emeritus Professor in 1986. During his time at UNE he took sabbaticals to Harvard on a Fulbright Award and Oxford.

Professor Stanton received many prizes and awards including the President's Award of the Australasian Institute of Mining and Metallurgy, the Goldfields Gold Medal of the Institute of Mining and Metallurgy (London), the William Smith Medal of the Geological Society (London), the W R Browne Medal of the Geological Society of Australia, the Penrose Medal of the Society of Economic Geologists (USA) and the Academy's Haddon Forrester King Medal in 1998. He was an Honorary Fellow of the Institute of Mining and Metallurgy and a Distinguished Fellow of the Royal Society of New South Wales in 2009. He was awarded the RSNSW Archibald Ollé

Prize, the Society's Medal and the Clarke Medal. Professor Stanton was appointed an Officer of the Order of Australia in 1996.

Professor Stanton generously gave his time to the Academy over five decades. He served on numerous committees including National Committees and served on Council and as Vice-President.

Read the transcript of a 2008 interview with Professor Stanton.<sup>56</sup>

## Upcoming Events



### The stories we tell ourselves as STEMM leaders

2:00 PM September 03, 2020

Unquestionably, this is a complex, volatile, uncertain and chaotic time. The COVID-19 pandemic is leading to unprecedented levels of job uncertainty, anxiety and depression.

While facing these challenges, the research workforce has also been called to contribute to the pandemic response. These competing trials can paint a bleak picture for early- and mid-career researchers, making them feel they are at the mercy of these unprecedented changes and insurmountable obstacles.

The Early- and Mid-Career Researcher (EMCR) Forum is working to support the EMCR community and keep researchers connected throughout COVID-19. The EMCR Forum is hosting **online opportunities**<sup>57</sup> designed to address the needs of EMCRs in Australia and support their careers during this crucial time.

The **stories we tell ourselves as STEMM leaders webinar**<sup>58</sup> is an opportunity for EMCRs to analyse their current situation, think about what is within

<sup>56</sup> [www.science.org.au/learning/general-audience/history/interviews-australian-scientists/professor-richard-stanton](http://www.science.org.au/learning/general-audience/history/interviews-australian-scientists/professor-richard-stanton)

<sup>57</sup> [aas.eventsair.com/emcr-forum-webinar](http://aas.eventsair.com/emcr-forum-webinar)

<sup>58</sup> [aas.eventsair.com/emcr-forum-webinar/#upcoming-events](http://aas.eventsair.com/emcr-forum-webinar/#upcoming-events)

their control and search for the tools to control the narrative of their story.

Join our facilitator, Fabian Dattner to discuss key questions that can help your journey to recovery:

- What if our ability to optimise what is happening – is least of all about the virus, funding and jobs, and most of all about the stories we tell ourselves?
- How are we talking to each other?
- What language are we using?
- Do we know what we are saying is true; about ourselves, others, the context we are working in?
- How does believing what we tell ourselves make us feel?
- Do we know how to change our stories, so they help us rather than increasing our burdens?

### About the facilitator

Fabian Dattner is the founder and CEO of Dattner Group, a leadership consultancy that specialises in cultural transformation, executive development, senior leadership development and working with women. Fabian is well known to many Australians as an ethics commentator, leadership expert, advocate and activist for women in leadership. She has a lifetime interest in education and the importance of listening carefully to what people want from leaders and what they are willing to contribute within an engaged culture. Fabian is not afraid to challenge the existing paradigm of leadership.

Fabian brings a great deal of personal experience in crisis management and inspiring people to think differently about the part they have to play.

### Event sponsor

#### UniBank

This event has been made possible with the support of UniBank. UniBank are an official supporter of the Australian Academy of Science. When COVID-19 began, they recognised the need for human connection and learning to continue for EMCRs. They approached

the Academy with an offer to assist with the creation of an online event to benefit the EMCRs. UniBank is committed to the ongoing partnership of the Academy, EMCRs and the STEM sector through and beyond COVID-19.

**Understand how UniBank can help you with your financial needs<sup>59</sup>.**

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# FALLING WALLS LAB AUSTRALIA

The organisers are independent partners of the Falling Walls Foundation.

## Falling Walls Lab Australia 2020

### International Falling Walls Lab

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

The goal of the Falling Walls Lab is to advance scientific and entrepreneurial visions, and to initiate and promote exchange between outstanding talents and innovative thinkers across disciplines. It is an international forum for the next generation of outstanding innovators and creative thinkers that takes place in over 55 countries annually, where local Falling Walls Labs showcase the quality, diversity and passion of their region's most innovative minds. The Lab is a challenging and inspiring platform for emerging bright individuals, giving them an exceptional opportunity to become the next big success story in innovation.

This year the Falling Walls Conference has changed format and is now **Falling Walls Remote 2020: Breakthroughs of the Year**. It will shift from a series of meetings and one conference

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<sup>59</sup> [www.unibank.com.au/join](http://www.unibank.com.au/join)

with a limited number of speakers and topics to a global showcase that gathers, celebrates and discusses a much broader set of breakthroughs in science and society. In place of the traditional Lab finale, winners of the local Falling Walls Labs will have their pitch video shared on the Falling Walls social platforms. From these videos, a panel of judges will select 10 finalists who will take part in the international digital live event on 4 November 2020. One presenter will then be awarded the Breakthrough Winner of the Year title in the Emerging Talents Category on pitching their breakthrough project along with nine other luminaries on the grand stage of the digital live event Falling Walls Day (9 November 2020) in front of an audience of industry leaders, decision-makers, investors, and international media representatives.

### Falling Walls Lab Australia

On **8 September 2020**, the Australian Academy of Science will host the fifth Falling Walls Lab Australia **virtually**.

Selected participants for this Lab will give a three-minute presentation on their research work, business model or unique initiative to a broad audience from science and industry, including a jury of distinguished academics and businesspeople who will select the most innovative and promising idea as the winner of Falling Walls Lab 2020 to represent Australia.

The distinguished jury will be chaired by Academy President, Professor John Shine. The Academy will award a prize of \$1000 to the three presenters who place first, second and third. They will also receive a professional video created by the Academy's own production team.

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

**Date:** Tuesday 8 September 2020

**Time:** 2.00 pm – 4.00 pm

**Location:** Online

**Program booklet**<sup>60</sup>



### scienceXart: spot the maths

To celebrate mathematics and its prominence in science and society, the Australian Academy of Science's National Committee for Mathematical Sciences is hosting scienceXart: spot the maths, a photographic competition for school students of all ages. A collaboration with reSolve<sup>61</sup> and supported by the **Australian Mathematical Society**<sup>62</sup> and the **Statistical Society of Australia**<sup>63</sup>, this initiative is part of the Academy's celebration of the **International Mathematical Union**<sup>64</sup>'s Centennial.

Open for entries from 28 June to 25 September, the competition engages students with the mathematical sciences and highlights the inherent creativity of maths.

**More information of scienceXart: spot the maths**<sup>65</sup>

<sup>60</sup> [www.science.org.au/files/userfiles/events/documents/program-booklet-fw12020.pdf](http://www.science.org.au/files/userfiles/events/documents/program-booklet-fw12020.pdf)

<sup>61</sup> [www.resolve.edu.au/](http://www.resolve.edu.au/)

<sup>62</sup> [www.austms.org.au/](http://www.austms.org.au/)

<sup>63</sup> [www.statsoc.org.au/](http://www.statsoc.org.au/)

<sup>64</sup> [www.mathunion.org/](http://www.mathunion.org/)

<sup>65</sup> [www.science.org.au/sciencexart/spot-the-maths](http://www.science.org.au/sciencexart/spot-the-maths)