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## The Bulletin 477

### November 2023

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#### A message from the President

Dear <<First Name>> <<Last Name>>

Today's world is particularly contested and uncertain. Known threats and conflicts sit alongside emerging challenges such as rising costs of living, natural disasters, extreme weather events, erosion of social cohesion, and rising geopolitical tensions. I take a moment here to wish everyone reading this well as you navigate your own personal circumstances.

In the spirit of arming our members and the community with tools to create better futures through the transformative power of knowledge, this year's

RSNSW and Learned Academies Forum "[Our 21<sup>st</sup> Century Brain](#)" on 02 November focuses on recent progress in unravelling the workings of the brain and opportunities to use our emerging understanding to promote human well-being well beyond the 21<sup>st</sup> Century.

More than 20 recognised experts will share their insights across five sessions. The Forum's keynote speeches will be presented Professor Lucy Palmer (Viertel Senior Medical Research Fellow; University of Melbourne's Florey Institute of Neuroscience and Mental Health) and via video by Dr Joshua Gordon (Director of the US National Institute of Mental Health). Even if you are not attending the Forum in person, I encourage you to participate using the [live-streaming option](#). I also encourage you to circulate the link across your respective networks and join the discussion during the day using the hashtag [#21stCenturyBrain](#) and tagging [@RoyalSocNSW](#).

I encourage you also to participate more broadly in the Society's social media presence. Our newly appointed Communications Officer has added a page to our website under the heading "[How to tag the Royal Society of New South Wales in your social media posts](#)". Do tag the Society in your social media



accounts and let us know what you're up to, whether you're publishing a new paper, winning an award, or simply sharing photos from the latest event. You can also follow us on [X / Twitter](#), [Facebook](#), [LinkedIn](#), and [YouTube](#) to keep updated on the latest news, events, recordings, and opportunities.

In addition to the Forum, the Society and its Branches are hosting [seven speakers](#) throughout the rest of the rest of October and November in various venues across the State. At the final meeting for the year in Sydney, on 29 November, I will be announcing the winners of the Society's 2023 Awards.

Another feature in our year-end calendar is my letter inviting members to renew their subscriptions for 2024. The membership fee will remain unchanged from 2023. My letter outlines the many accomplishments of the Society during 2023 and its even greater ambitions for 2024 and beyond that are being framed currently through the Master Planning Project.

The Society is dependent on member subscriptions to fund its work. It is equally dependent on donors without whom the delivery of new ideas is impossible. You will see in your renewal letter my invitation to make a tax-deductible donation to the Society's new [Bicentennial Postgraduate Scholarships](#). These will support our next-generation researchers who are so critical to the future. We will be awarding three scholarships plus a complimentary year of Associate Membership of the Society to recognise outstanding achievements by young scholars from any academic field in the sciences or the humanities.

And don't forget that the Society has put in place the information you need if you wish to leave the Society a [gift in your will](#). Since its inception, the Society has benefited greatly from generous donations and bequests from members and other benefactors. Your gift will strengthen the Society as an inclusive and diverse learned institution dedicated to enriching lives through knowledge and inquiry.

We work for the Society because we understand the need to enhance public discourse on a wide range of topics that are crucial to our future. Society members have excellent ideas to contribute. In that spirit, I look forward to hearing your ideas and suggested ways to bring them to fruition.

Susan Pond AM FRSN FTSE FAHMS  
[President, Royal Society of NSW](#)

## For your diary

- [Hunter Branch Meeting 2023-4](#) (Thursday, 26 October 2023, 6.00 – 8.00 pm AEDT, Hunter Room, Newcastle City Hall, 290 King Street, Newcastle), *Electrical Energy Supply. So what's all the fuss about*, Professor Colin Waters, School of Information and Physical Sciences, University of Newcastle
- [Royal Society of NSW and Learned Academies Forum 2023](#) (Thursday, 2 November, 8.45 am – 5.00 pm AEDT, Live streaming from Government House Sydney, Theme: *Our 21st Century Brain*; Speakers listed on the website and in the [program brochure](#))
- [1317th Ordinary General Meeting and 2022 Clarke Memorial Lecture](#) (Wednesday, 8 November 2023, 6.00 for 6.30 – 8.00 pm AEDT, Metcalfe Auditorium, State Library of New South Wales, Macquarie Street, Sydney), *Caves as observatories of groundwater recharge*, Professor Andy Baker FRSN FAGU, School of Biological, Earth, and Environmental Sciences, UNSW Sydney
- [Southern Highlands Branch Meeting 2023-10](#) (Thursday, 16 November 2023, 6.30 – 7.30 pm AEDT, RSL Mittagong, Joadja/Nattai Room), *Secrets of cultural heritage revealed at ANSTO*, Dr Joseph Bevitt, Senior Instrument Scientist, ANSTO
- [Western NSW Branch Meeting 2023-4](#) (Thursday, 16 November 2023, 6.00 – 8.00 pm AEDT, Gums Cafe, Charles Sturt University, Albury), *Thirst for power — the rivers of conflict in Southeast Asia*, Professor Lee Baumgartner, Executive Director, Gulbali Institute for Agriculture, Water, and Environment, Charles Sturt University
- [1318th Ordinary General Meeting and Open Lecture](#) (Wednesday, 29 November, 6.00 for 6.30 – 8.00 pm AEDT, Gallery Room, Mitchell Building, State Library of New South Wales, 1 Shakespeare

Place, Sydney), *What do we really know about 20th and 21st-century sea-level change?* Emeritus Professor John Church AO FAA FTSE FAMS FAGU, Climate Change Research Centre, UNSW Sydney

The Society's complete events program for the year is published in the [online Events Calendar](#), which is updated regularly.

## News

### Distinguished Fellow, Michelle Simmons, named as 2023 ABC Boyer Lecturer

**Scientia Professor Michelle Simmons AO FRS DistFRSN FAA FTSE** of UNSW Sydney, a pioneer in atomic electronics and a global leader in quantum computing, has been named the ABC's Boyer Lecturer for 2023. This year's series of four Boyer Lectures is titled 'The Atomic Revolution' and will cover manufacturing at the atomic scale, why Australia is perfectly positioned to build the world's first error-corrected quantum computer, and the importance of doubt in science.



The series is [broadcast on ABC Radio National](#) commencing at 9.30 am on 22 October 2023 and will be available on ABC Online.

The Boyer Lectures, which were initiated in 1959, is a series of talks delivered by prominent Australians presenting on major social, scientific, or cultural issues. They are modelled on the BBC's Reith Lectures and are named in honour of the later Sir Richard Boyer, a former chair of the ABC Board, who led to their instigation.

The Council of the Society extends its sincere congratulations to Michelle Simmons on this recognition.

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### Distinguished Fellow, Brian Schmidt, awarded an ATSE Fellowship

The Society was delighted to learn that Distinguished Fellow, **Professor Brian Schmidt AC FRS DistFRSN FAA FTSE**, Vice-Chancellor of the Australian National University was inducted as a Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE) on 11 October 2023.



The ATSE citation reads as follows:

Vice Chancellor Professor Brian Schmidt is a leading educator, communicator, innovator, and astronomer. He is a leader of immense community standing.

In 2011, Brian jointly won the Nobel Prize for Physics for the discovery that the expansion of the universe is accelerating — a breakthrough in understanding our cosmos that lends weight to the existence of “dark energy”.

Through his leadership as Vice Chancellor of the Australian National University, Brian has been a powerful voice for STEM research, innovation, and education in Australia. He has championed diversity, built stronger commercialisation capability at Australia's national university, and fostered greater collaboration with leading international universities.

Professor Schmidt, who has been Vice-Chancellor of ANU since 2016, steps down from this role at the end of 2023 to return to his research and teaching in astrophysics within the ANU Research School of Astronomy and Astrophysics as a Distinguished Professor.

The Council of the Society extends sincere congratulations to Professor Schmidt on this further recognition of his outstanding career and extensive contributions to Australian education, research, and innovation.

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## Society Fellow, Noel Cressie, awarded the ISBA Mitchell Prize

The Royal Society of New South Wales was delighted to learn of the awarding of the Mitchell Prize by the International Society for Bayesian Analysis to one of its Fellows, **Distinguished Professor Noel Cressie FRSN FAA**, from the University of Wollongong (UoW).



The prize, awarded in August 2023 at the Joint Statistical Meetings in Toronto, Canada, recognises an outstanding paper that describes how a Bayesian analysis has solved an important applied problem. In this case, Professor Cressie was the senior co-author of the paper by Zammit-Mangion, A., Bertolacci, M., Fisher, J., Stavert, A., Rigby, M., Cao, Y., and Cressie, N. (2022). WOMBAT v1.0: a fully Bayesian global flux-inversion framework. *Geoscientific Model Development*, **15**, 45-73 (doi:10.5194/gmd-15-45-2022) that involved collaborations between statisticians and atmospheric chemists. This work estimates sources and sinks of carbon dioxide around the globe to suggest mitigation strategies in support of net-zero carbon emissions.

Professor Cressie, who is currently the Director of the Centre for Environmental Informatics at UoW undertook his undergraduate studies in mathematics at the University of Western Australia and subsequently graduated with a PhD from Princeton University. Much of his professional life has been spent in the USA, serving as a professor and distinguished professor at Iowa State University and Ohio State University, before taking up his current role at UoW in 2012.

The Council of the Society extends warm congratulations to Professor Cressie on this recent recognition of his important work.

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## Society Fellow, Rebecca Ivers, awarded an AAHMS Fellowship

The Society was delighted to learn that Society Fellow, **Professor Rebecca Ivers FRSN FAHMS**, Scientia Professor of Public Health and Head of the School of Population Health at UNSW Sydney, was inducted as a Fellow of the Australian Academy of Health and Medical Sciences (AAHMS) on 12 October 2023.

The AAHMS citation reads as follows:

Professor Rebecca Ivers is an Australian research leader in the field of public health, with a focus on injury prevention and trauma care research. She has a distinguished track record of research that has significantly advanced our understanding of the burden, prevention, and care of injury across the life course. Her research has contributed substantively and substantially to reducing injury in



both young and older people and has led to better, more culturally safe trauma care in Australia and globally.

The Council of the Society extends its sincere congratulations to Professor Ivers on this recognition of her outstanding research career and contributions to public health.

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## **Distinguished Fellow, Michelle Simmons, named as winner of the 2023 Prime Minister's Science Prize**

At a presentation dinner held on the evening of 16 October 2023 at Parliament House Canberra, Distinguished Fellow, **Scientia Professor Michelle Simmons AO FRS DistFRSN FAA FTSE FAAAS** of UNSW Sydney was announced as the winner of the 2023 Prime Minister's Prize for Science. This award recognises the work of Professor Simmons in creating the new field of atomic electronics, discoveries from which are powering the transition from the digital to the quantum age, with the goal of developing the first error-corrected quantum computer here in Australia.



Quantum computing is predicted to solve certain extremely complex problems in seconds that would otherwise take thousands of years. This has the potential to impact almost every industry dependent on data, for example in revolutionising therapeutic drug design, optimising route planning for delivery or logistical systems, and creating better fertilisers.

Professor Simmons is the Director of the ARC Centre of Excellence for Quantum Computation and Communication Technology, headquartered at UNSW Sydney, and is the Founder and CEO of Silicon Quantum Computing, Australia's first quantum company. She was the 2018 Australian of the Year and is a Fellow of the Royal Society of London, the American Academy of Arts and Science, the American Association of the Advancement of Science, the Australian Academy of Technology and Engineering, the Australian Academy of Science, and a Distinguished Fellow of the Royal Society of NSW. During her career, she has held two ARC Federation Fellowships and an ARC Laureate Fellowship and has been awarded numerous awards, amongst which is the RSNSW Walter Burfitt Prize in 2013.

Michelle Simmons discussed her research in an Ideas@theHouse talk in August 2022 titled "[Manufacturing at the Atomic Scale](#)", which is available on the Society's YouTube channel. Earlier this month, it was announced that Michelle would be the presenter of the ABC's Boyer Lectures in 2023. To learn more about the award of the Prime Minister's Science Prize to Professor Simmons, please see the [announcement on the Department of Industry, Science, and Resources website](#) and also listen to the [interview on ABC Radio National Breakfast](#) from 17 October.

The Council of the Society extends its warmest congratulations to Professor Simmons on this capstone recognition of a truly outstanding research career.

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## **Society Fellow, Andrew Blakers, amongst the winners of the 2023 Queen Elizabeth Prize for Engineering**

At a ceremony held at Buckingham Palace on 12 October 2023, His Majesty King Charles III presented the 2022 and 2023 Queen Elizabeth (QE) Prizes for Engineering. These prizes, inaugurated in 2011,



recognise engineers responsible for groundbreaking innovations that have been of global benefit to humanity.

The 2023 QE Prize for Engineering was awarded to an Australian-led team from UNSW comprising Scientia Professor Martin Green (on the left in the image below), Professor Andrew Blakers (third from the right), a RSNSW Fellow, Dr Aihua Wang (second from the right), and Dr Jianhua Zhao (immediately to the right of King Charles) for the invention and development of Passivated Emitter and Rear Cell (PERC) solar photovoltaic technology.



The citation for the prize notes that “this technology has greatly improved the energy conversion efficiency of commercially dominant silicon cells by improving the quality of both the top and the rear surface of standard silicon solar cells. PERC introduced an additional layer on the back surface that helped prevent recombination and, further, reflected unused photons back into the silicon to generate more electrons. Through continued research and development, and the help of many others worldwide, the 2023 QE Prize laureates have significantly reduced the costs of solar panels, with the cost of solar power generation falling by over 80% in the past decade. PERC technology is now the most commercially viable and efficient silicon solar cell technology used in solar panels and large-scale electricity production, and accounts for almost 90% of the global solar cell market.”

In receiving this award, **Andrew Blakers FRSN FTSE**, who is now an Emeritus Professor of Engineering at the Australian National University, said “It is an honour to be presented the 2023 Queen Elizabeth Prize for Engineering alongside academic colleagues and friends at a venue that is as renowned as Buckingham Palace.”

[A summary of the PERC technology](#) that originated at UNSW during the 1980s, together with a report on, and images from, the [Buckingham Palace presentation ceremony](#), can be seen on the Queen Elizabeth Prize for Engineering website.

The Council of the Royal Society of New South Wales extends its warm congratulations to Professor Andrew Blakers, and all members of the team, on this recognition of their profound discovery that is contributing greatly to substantially increased renewable energy generation in today’s world.

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## Events

### Hunter Branch Meeting 2023-4

#### Electrical Energy Supply. So what’s all the fuss about

## Professor Colin Waters

### Professor of Physics University of Newcastle



**Date:** Thursday, 26 October 2023, 5.30 for 6.00 — 8.00 pm AEDT

**Venue:** Hunter Room, Newcastle City Hall, 290 King St, Newcastle NSW

**Entry:** Society members, \$15; Non-members, \$25; Students, \$5

**Registration:** [Registration through Membes](#) is required by 5.00 pm on Wednesday, 25 October

**Enquiries:** [Via email](#) to the RSNSW Hunter Branch Secretary (Prof. Philip Bolton)

**Society Members, Fellows, and members of the public are welcome**

[Please click here to register](#)

**Summary:** The different technologies, uses, and costs of electricity generation are common themes in the media. The questions and government comments range from the selection of fuel mix (e.g. coal, gas, renewables), sufficient capacity, carbon net-zero targets, rooftop solar and 'renewable' energy strategies. This complex and multi-faceted topic will be tackled in three stages. These are: i) a first principles foundation explaining the language of energy generation and use, ii) a survey of electrical energy generation and conversion including coal/gas, solar, nuclear, hydro, gravity, wind, and tidal technologies, iii) aspects of environmental and business case metrics as related to electricity generation options.

**Professor Colin Waters** is internationally recognised for his research in space physics which combines interests in remote sensing, multi-dimensional ground-based and spacecraft sensor data analyses, and energy conversion and transport in the near-Earth space environment. He is a director of Tentacle CMI, a data analytics company that provides data-based prediction-as-a-service and tackles difficult problems in data analytics. He has a PhD in space physics from the University of Newcastle and has taught undergraduate and postgraduate University students for 30 years. He has served in administrative roles including Bachelor of Science convenor, Assistant Dean of the Faculty of Science, Head of School (Maths, Physics, and Statistics), in addition to serving as an Associate Editor for the Journal of Geophysical Research – Space Physics.

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## RSNSW and Learned Academies Forum 2023

### OUR 21<sup>st</sup> CENTURY BRAIN

**Date:** Thursday, 2 November 2023, live streaming from 8.45 am–5.00 pm AEDT

**Venue:** Live streaming from Government House Sydney

**Registration:** for the [live streamed program through Humanitix](#)

**Brochure and Program:** for the live streamed program — [Summary](#), [Complete Program](#)

[Please click here to register  
for the live stream](#)

#### Summary

The brain underpins our basic instincts and needs, and behavioural responses to the world around us. The brain mediates our compassion, reason, and imagination which are reflected in great works of the arts and sciences. Yet our brain is also the source of distress, dysfunction, and malice. Despite centuries of

*The Royal Society of New South Wales & Learned Academies Forum presents*

# OUR 21<sup>ST</sup> CENTURY BRAIN

Thursday 2 November 2023

8:45am–5:00pm AEDT

Government House Sydney + live streaming



recurring impacts of tribalism, racism, dehumanisation, and exclusion of ‘outsiders’, we continue to inflict suffering on others.

At the same time, the 21st century brings new challenges that extend well beyond immediate threats to very complex societal challenges such as global security, climate change, massive demographic shifts, resource management, information overload, and artificial intelligence.

Have we reached the edge of our human capacity to respond effectively as either individuals or collective groups?

The context and demands on our brains have been transformed by the very tools we have created, including new information technology platforms, and rapidly developing and deployed forms of artificial intelligence. Diseases of the brain are increasingly prevalent in our ageing population, as are the increasing mental health challenges that are evident across the human lifespan.

Considerable progress across the sciences and humanities has deepened our understanding of genetic, environmental, and social factors that underpin brain development and function. Rising demands on our capacity to respond appropriately to globalised threats bring an urgent need to apply our scientific understanding to the development of just and sustainable solutions.

This year’s Royal Society of New South Wales and Learned Academies Forum focusses on recent progress in unravelling the workings of the brain and opportunities to use our emerging understanding to promote human wellbeing well beyond the 21st Century.

The Forum is held under the auspices of Her Excellency the Honourable Margaret Beazley AC KC, Governor of New South Wales. The Royal Society of New South Wales acknowledges the generous support by Her Excellency, the Academies, the Office of the NSW Chief Scientist and Engineer, and Haus Holdings.

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## 1317th Ordinary General Meeting and the 2022 Clarke Memorial Lecture

### Caves as observatories of groundwater recharge

**Professor Andy Baker FRSN FAGU**



## School of Biological, Earth, and Environment Sciences UNSW Sydney



**Date:** Wednesday, 8 November 2023, 6.00 for 6.30 — 8.00 pm AEDT

**Venue:** Metcalfe Auditorium, State Library of New South Wales, Macquarie Street, Sydney

**Entry:** Society members, \$10; Non-members, \$20; Students, \$5

**Registration:** [Registration through Membes](#) is required

**Drinks:** available from a cash bar in the adjacent Macquarie Room from 6.00 pm

**All are welcome**

**Please note the changed venue. The Metcalfe Auditorium and the Macquarie Room are accessed from the Macquarie Street entrance of the State Library of NSW, through the bookshop and coffee shop.**

[Please click here to register](#)

**Summary:** Much of the world relies on groundwater as a water resource, yet it is hard to know when and where rainfall actually replenishes our groundwater aquifers. Caves that are situated above the groundwater table are unique observatories of water transiting from the land surface to the aquifer. This session will show how networks of loggers deployed in Australian caves (and mines and tunnels) have helped understand when, where and how much rainfall is needed to replenish the groundwater.

**Andy Baker** is a Professor in the School of Biological, Earth, and Environmental Sciences at UNSW Sydney. His research includes the investigation of the climate, soil, and groundwater processes that affect the cave and other subsurface environments. He is a Fellow of the American Geophysical Union and the Royal Society of New South Wales, and in 2022 he was awarded the Royal Society of New South Wales Clarke Medal (Geology) and Lecture for that year.

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## Western NSW Branch Meeting 2023-4

### Thirst for power — the rivers of conflict in Southeast Asia

**Professor Lee Baumgartner**

**Executive Director  
Gulbali Institute for Agriculture, Water, and Environment  
Charles Sturt University**



**Date:** Wednesday, 16 November 2023, 6.00 — 8.00 pm (AEDT)

**Venue:** Gum's Cafe, Thurgoona, Charles Sturt University, Albury

**Entry:** No charge

**Registration:** [Registration through Humanitix](#) is required for the face-to-face and online events

**All are welcome**

[Please register now](#)

*This meeting is a joint presentation of Charles Sturt University and the Western NSW Branch of the Royal Society of New South Wales.*

**Summary:** Water is life. Nowhere is this more significant than in Australia, the driest continent on Earth, and in Southeast Asia, where tens of millions of people rely on healthy rivers to provide ecosystem services. Ecosystem services include clean and safe river water, fish and other aquatic animals for protein and livelihoods, water for cultural benefits, industry, irrigation, and agriculture. However, with growing regional populations, river development infrastructure has become increasingly essential to provide these services. Storage dams, hydropower dams, storage weirs, irrigation infrastructure, and diversion systems are all ways in which water is harnessed to provide societal benefits and are now commonplace.

However, it is now widely accepted that these can lead to adverse environmental outcomes. This, combined with a changing climate, is putting more pressure on freshwater resources than ever before. In recent times this has resulted in large-scale fish kills, drying rivers, dwindling town supplies, and deteriorating water quality. Without intervention, the future of water security in Australia and Southeast Asia will be dominated by increased competition for a resource that is becoming increasingly scarce. Future water management must consider scenarios that combine technical solutions, sound policy, and strategies for water sharing which consider all water users. This Provocations Lecture will take a journey across Australia and Southeast Asia, exploring water security challenges and the innovative ways that communities are developing healthy rivers, in a changing climate, with growing regional populations.

**Professor Lee Baumgartner**, the Executive Director of Gulbali Institute for Agriculture, Water, and Environment at Charles Sturt University, is a Professor in Fisheries and River Management, and an applied researcher who has worked in the fisheries field for over 20 years. Lee is passionate about healthy rivers and helping fisheries worldwide, and has achieved substantial food security outcomes in countries working within the food-water-energy nexus. Lee's high-impact research focuses on developing and applying innovative technology in ecohydrology to reduce pressure on freshwater systems. Specifically, his work focuses on irrigation and hydropower sustainability, using innovation to ensure river communities can have food, water, and energy. Lee's multi-disciplinary work requires collaboration with engineers, functional ecologists, and water professionals.

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## 1318th Ordinary General Meeting and Open Lecture

**What do we really know about  
20th- and 21st-century sea-level change?**

**Emeritus Professor John Church AO FAA FTSE  
FAMS FAGU**

**Climate Change Research Centre  
UNSW Sydney**



**Date:** Wednesday, 29 November 2023, 6.00 for 6.30 — 8.00 pm AEDT

**Venue:** Gallery Room, State Library of New South Wales, 1 Shakespeare Place, Sydney

**Entry:** Society members, \$10; Non-members, \$20; Students, \$5

**Registration:** [Registration through Membes](#) is required

**Drinks:** available from a cash bar from 6.00 pm

**All are welcome**

[Please click here to register](#)

**Summary:** Accelerating sea-level rise in much of the world will result in growing impacts through the 21st century and beyond. Despite the clear identification of an accelerating rise, many uncertainties remain. Understanding historical sea-level change is a prerequisite for building confidence in useful and accurate predictions of future changes.

Our recent work has explored the sensitivity of global and regional sea-level reconstructions to poorly-known land motions and the factors causing temporal and regional variations in the rate of rise. With this knowledge, existing reconstructions of global mean sea level are mostly not significantly different from each other from 1900 to the present, both in the time-averaged rate and the temporal variability. However, while the average rate from 1900 to the present is similar to that from the sum of contributions, the rate of reconstructed GMSL rise is significantly smaller/larger than the sum of contributions prior to 1940 and after 1970. Why is this? What do we really know? What are potential explanations for this continuing enigma?

And what can we project about future sea levels, both for the 21st century and beyond? And can we constrain projections for the 21st century and beyond?

**Dr John Church** is an Emeritus Professor in the Climate Change Research Centre, University of New South Wales. He has published across a broad range of topics in oceanography. His area of expertise is the role of the ocean in climate, particularly anthropogenic climate change, and the oceanic storage of increased heat in the World's oceans. He is recognised as a world leader in understanding historical and projected global and regional sea-level rise, having provided historical estimates of sea-level change since the late 19th century, robust explanations for the rise, its attribution to greenhouse gas emissions and improved projections of global and regional sea-level rise.

He is the author of over 180 refereed publications and over 110 other reports and has co-edited three books. He was the co-convening lead author for the Chapter on Sea Level in the IPCC Third and Fifth Assessment Reports. His expertise has been recognised nationally and internationally with a number of highly significant awards: the Roger Revelle Medal by the Intergovernmental Oceanographic Commission (2006), a CSIRO Medal for Research Achievement (2006), the Eureka Prize for Scientific Research (2007), the AMOS R.H. Clarke Lecture (2008), the AMOS Morton Medal (2017), a joint winner of the BBVA Frontiers of Knowledge Climate Change Category Prize (2019), the AAS Jaeger Medal (2021), the Royal Society of New South Wales James Cook Medal (2022), and the Prince Albert I Medal of the International Association for Physical Sciences of the Ocean (2023). He is an Officer of the Order of Australia, a Fellow of the Australian Academy of Science, the Australian Academy of Technology and Engineering, the American Geophysical Union, the American Meteorological Society, and the Australian Meteorological and Oceanographic Society.

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## **Branch and Committee Reports**

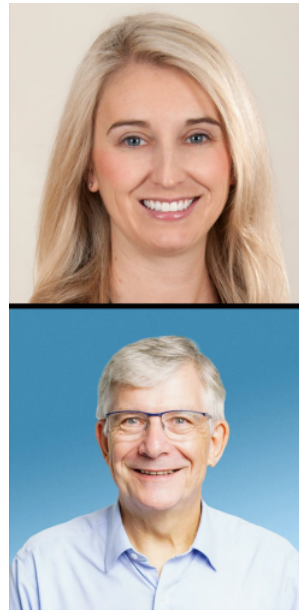
### **Program Committee Report**

The Society provides an active program of events through its Hunter, Southern Highlands, and Western NSW branches, and in Sydney.

With events held recently by the branches reported on separately in this Bulletin, this section focuses on recent events held in Sydney.

## Report on the September event held in Sydney

The face-to-face event following the 1316th OGM at the State Library focussed on '[Australia's nuclear future: a new discourse for the 2040s](#)'. Helen Cook, the Principal of GNE Advisory, is one of very few highly experienced lawyers specialising in establishing legal and regulatory frameworks for civilian nuclear power. Dr Adi Patterson FRSN FTSE, an active member of the Society, led ANSTO from 2009-2020 and now leads Siyeva Consulting, focussing on technology and energy issues.



In the context of increasing public debate in Australia on whether nuclear energy should be part of the mix for a low-carbon future, and the potential of small modular reactors (SMRs), Helen and Adi raised a number of issues. Helen noted the widespread adoption in our region of civilian nuclear power. She herself has developed the regulatory frameworks for some nations and described the lengthy process of negotiation needed. Adi argued that Australia runs the risk of being isolated in the area, and losing influence in consequence. The audience engaged in civilised debate on these controversial issues.

A recording of this event is [available on YouTube](#).

Christina Slade FRSN  
Chair, RSNSW Program Committee

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## Southern Highlands Branch Report

### Presentation Report — 19 October 2023

#### Are weeds becoming new native species?

**Professor Angela Moles FRSN**  
**Ecology and Evolution Research Centre**  
**UNSW Sydney**

Professor Angela Moles has always had a deep curiosity about the ways that plants and animals develop in different parts of the planet, at one stage in her life going to the extent of studying them in 75 different ecosystems around the world. Now with her team of researchers, she is challenging the Darwinian concept of evolution occurring over a geological timescale, involving thousands of generations. In this lecture, she presented her very strong research evidence that the process of evolution can take place over much shorter periods of time.





Angela Moles stated that when a species is introduced to a new environment, it is released from old enemies and is totally subjected to new growing conditions. In her view, these are excellent circumstances for observing evolutionary changes over a short timescale. Her team has shown, after years of painstaking research, that 70% of the plant species introduced to Australia have changed the way they grow since arriving here. She chose the particular plant species, South African Beach Daisy, *Arctotheca populifolia* to demonstrate the extraordinary changes that she had observed over years of detailed study, as the plant responded to its new environment in Australia.

*Arctotheca* is now demonstrating such huge changes that the introduced population is developing reproductive isolation from its source population in Southern Africa. This is a clear example of an introduced plant adapting to its new environment so well that it appears to be becoming a unique new species. This dramatic development prompts Angela Moles to suggest that, although most people do not like the idea yet, it surely is just a matter of time before unique new taxa such as this are accepted as new native species.

A milestone lecture in science.

Anne Wood FRSN

Chair, Southern Highlands Branch

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## Western NSW Branch Report

### Event Report

In conjunction with the Western NSW Branch of the Royal Society of New South Wales, Charles Sturt University is conducting its Provocations Public Lecture series that showcases and celebrates research at the University.



### Forthcoming Event

The final event in the Provocations Public Lecture series for 2023, titled [Thirst for power — The Rivers of conflict in Southeast Asia](#), will be presented by **Professor Lee Baumgartner**, Executive Director of the Gulbali Institute for Agriculture, Water and Environment, at the Charles Sturt University Albury Campus on Thursday, 16 November (6.00 pm AEDT).



[Detailed information](#) about this talk, and of the speaker, is presented in the event notices of this Bulletin. Registration for this event is available through [Humanitix](#) and a recording of the event will be made available on the Society's YouTube channel.

Nilima Mathai

Treasurer

Western NSW Branch

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## The Society and Social Media

The Society's presence on social media platforms is growing strongly, particularly following the appointment of the Society's part-time Communications Officer. Our [Facebook page](#), [LinkedIn channel](#), [X/Twitter feed](#), and [YouTube channel](#) are engaging an increased following, and we continue to build our repository of events on YouTube. Our YouTube channel now has over 640 subscribers, while the 130 videos online have received almost 80,000 viewings.

The social media icons at the end of this newsletter will take the reader to our pages on these platforms, from where you can follow, subscribe, and be notified of new content.

*As a Society member, please consider subscribing to our social media channels to support the Society's outreach, and also please encourage your friends and colleagues to similarly do so.*

## YouTube recordings of recent events

All online presentations and all face-to-face presentations held in Sydney and by the Western NSW Branch are recorded and uploaded to the Society's YouTube channel. These can be accessed directly from [YouTube](#) or from the [Presentations](#) page of the website.

For convenience, the video links below provide access to recordings from the most recent three months. We hope that these will be of interest to members.



YouTube recording of the presentation at the 1316th Ordinary General Meeting (4 October 2023) on the subject of *Australia's nuclear future: A new discourse for the 2040s*, presented by Helen Cook, Principal of GNE Advosory and Dr Adi Paterson, former CEO of the ANSTO. A summary of the session and a brief biography of each of the presenters are available from the [online event notice](#).



YouTube recording of the presentation at the 1315th Ordinary General Meeting (6 September 2023) on the subject of *Challenges for open enquiry and scholarship in a divided age*, presented by Professor Alan Davison, Dean of the Faculty of Arts and Social Sciences at the University of Technology Sydney. A summary of the session and a brief biography of each of the presenters are available from the [online event notice](#).



YouTube recording of the lecture delivered at the Society's Western NSW Branch 2023-3 meeting by Professor Ganna Pogrebna, Executive Director of the Artificial Intelligence and Cyber Futures Institute at Charles Sturt University, on the subject of *Behavioural data science as a game changer*. An abstract of the talk and the biography of the presenter are available from the [online event notice](#).



YouTube recording of the 10 August 2023 presentation delivered at Ideas@theHouse on the subject of *Ideas for marine stewardship and sustainability in a time of acceleration* by Professor Emma Johnston AO FRSN FAA FTSE, Deputy Vice-Chancellor (Research) at the University of Sydney. An abstract of the talk and the biography of the presenter are available from the [online event notice](#).



YouTube recording of the presentation at the 1314th Ordinary General Meeting (2 August 2023) on the subject of *Convergence: the hybridisation of the future*, featuring a conversation between Associate Professor Catherine Ball, futurist, author, and researcher, and Maria MacNamara, Director of Government Affairs and Innovation Strategy at Kyndryl. A summary of the session and a brief biography of each of the presenters are available from the [online event notice](#).

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Edited by: [Lindsay Botten](#) FRSN, Webmaster, Royal Society of New south Wales

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