



The Bulletin 406

The Royal Society of New South Wales

ABN 76 470 896 415

ISSN 1039-1843

25 January 2017

For Your Diary:

16 February 2017

Southern Highlands Branch Lecture

Professor Adam Guastella

“Autism and Oxytocin”

6:30 pm start

Chevalier College, Bowral

(For more information, see page 4)

23 February 2017

Annual Meeting of the Four Societies

Rear Admiral the Honourable Kevin
Scarce AC CSC RAN (Rtd)
ComplEAust

**“South Australia: A Nuclear State in
a Global Solution”**

5:30 pm for 6-8 pm

International Convention Centre
Darling Harbour, Sydney

(For more information, see page 6)



Patron of The Royal Society of NSW

His Excellency General The Honourable
David Hurley AC DSC (Ret'd)
Governor of New South Wales

Public Lecture & OGM

RSNSW Scholarship Awards

Wednesday, 1 February 2017

This special event celebrates the work of three outstanding young researchers. They are each a candidate for an advanced degree in a science-related field within New South Wales or the Australian Capital Territory.

Yik Lung (Jeremy) Chan

School of Life Sciences

University of Technology Sydney

Andrew Ritchie

School of Life and Environmental Sciences

University of Sydney

Isobel Ronai

School of Life and Environmental Sciences

University of Sydney.

For more information, see page 3

Date: Wednesday, 1 February 2107: 6:15 for 6:30 pm

Venue: Union, University and Schools Club, 25 Bent Street, Sydney

Entry: \$10 for Members and Associate Members of the Society,
\$20 for Non-Members, which includes a welcome drink.

Dress: Business

Dinner (including drinks): \$80 for Members and Associate
Members, \$90 for Non-Members.

Reservations must be made at least 2 days in advance

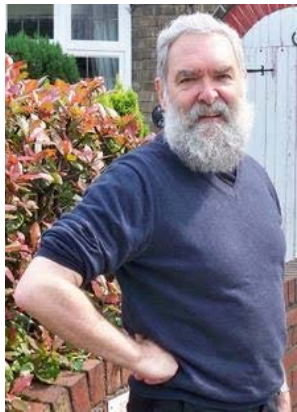
Reservations must be made at least 2 days in advance

Reservations: <https://nsw-royalsoc.currinda.com/register/event/28>

Enquiries: royalsoc@royalsoc.org.au Phone: 9431 8691

All are welcome.

From the President



I send my sincere wishes for a fruitful and fulfilling 2017 to all Members of the Royal Society of New South Wales. I trust we shall see many of you at meetings of the Society during 2017. In addition to the Ordinary General Meetings at the Union, University and Schools Club, we are working on another series of events that will offer a different experience to widen the offerings of the Society. Please look out for notices in the Bulletin, on the web site and by email. But first, do come to the February OGM at which we shall hear from three talented winners of the 2016 RSNSW Scholarships. These talks have been some of the highlights of recent years. Who can forget the mathematician who obtained two enormous numbers between which he had proved there must be a prime number, or the sociologist who crowd funded a trip to Syrian refugee camps to find out about the mental health of women fleeing conflict? This year we have effects of smoking in pregnancy, modelling archaic genetic data to understand evolution, and the secret life of bees, an eclectic mix as you could wish for (see page 3).

The year 2016 finished with the Reception which celebrated the 150th anniversary of the Society becoming the Royal Society of New South Wales. The highlight of the evening was Mrs Hurley singing “Happy Birthday” to the Society. The Reception precedes the Forum, and we duly assembled again in Government House on the following morning for “Society as a Complex

System”. For those of you who attended we ask you to complete the survey, (the link should have been sent to you). I thought it went well. As usual there was never enough discussion although there were some cracking talks. PowerPoint presentations are on our web site <http://royalsoc.org.au/index.php/four-academies-forum-2016-presentations> and the invited talks will appear as full papers in the Journal in due course.

The Christmas Party, held at the December OGM, was preceded by the Jak Kelly Award presentation and talk. Irene Kelly presented the award, and we very much appreciate her continued association with the Society. The winner was Matthew Barr of Newcastle University who had invented a new kind of imaging device, the scanning helium microscope. He gave one of the best talks I have heard in a while, explaining the complexities of his device clearly and just right for his audience. <http://royalsoc.org.au/index.php/blog/1248th-ogm-and-christmas-party>

Meanwhile our members and Fellows have not been idle. I see on the front (internet edition) page of the Sydney Morning Herald a report on Professor Steve Sherwood FRSN, who was warning of the effects of global warming on the frequency of abnormal weather events (<http://www.smh.com.au/environment/more-rain-on-the-horizon-as-climate-change-affects-australia-study-finds-20170115-gts011>). His work is published in Nature Communications (abstract <http://www.nature.com/nclimate/journal/vaop/ncurrent/full/nclimate3201.html>).

Once again I look forward to stewarding the Royal Society of New South Wales through 2017, and, of course, please write with comment and suggestions to president@royalsoc.org.au.

Brynn Hibbert FRSN

Yik Lung (Jeremy) Chan
School of Life Science,
University of Technology Sydney



“Effects of maternal cigarette smoke exposure on brain health in offspring”

We do not understand well how maternal smoking and secondhand smoke exposure during pregnancy can cause lifelong adverse effects in the offspring, especially in their neurological function. Maternal cigarette smoke exposure is a risk factor for the shutdown of blood and oxygen supply to the brain. This can lead to several functional defects, including problems with movement, sensation, strength, and thinking, increasing the financial burden of both the family and government. My work aims to understand how maternal cigarette smoke exposure affects brain health, to allow the discovery of therapeutic targets for potential interventions. In this talk, I will present my latest findings in a mouse model of maternal cigarette smoke exposure carried out during my PhD.

Andrew Ritchie
School of Life and Environmental Sciences
University of Sydney



“New Ways of Modelling the Ancient Past to Understand Evolution”

Molecular dating, powered by increasing floods of genetic data, is allowing biologists to look ever more closely at the central mystery of evolution – the origin of species. At the same time, the digital revolution has led to the application of biological methods to surprising new types of data – such as the imprints of human history left in the relationships among world languages. To do this, biologists and linguists construct models that interpret genetic and lexical data in the light of our assumptions about the evolutionary process. In this talk, I describe the available models and discuss my findings on their powers and pitfalls for analyses of the ancient past.

Isobel Ronai
School of Life and Environmental Sciences
University of Sydney



“Anarchy in the honey bee colony: the genetic basis of worker sterility”

Currently little is known about the mechanisms that underlie worker sterility in the social insects. Studies into a mutant ‘anarchistic’ strain of honey bee identified a promising candidate gene for regulating worker fertility. My results suggest that this *Anarchy* gene is involved in the regulation of the worker’s ovary via the mechanism of programmed cell death. My findings indicate that a pheromone from the queen honey bee affects the *Anarchy* gene and triggers the reproductive inhibition of the workers. This is a breakthrough in understanding the mechanisms of worker sterility in the social insects.

2017 Events

Royal Society – Southern Highlands Branch

Date*	Event	Speaker	Topic	Location**
16-Feb-17	Public Lecture	Prof Adam Guastella University of Sydney	Autism and oxytocin	Chevalier College, Bowral
16-Mar-17	Public Lecture	Dr Barbara Briggs Sydney Botanical Gardens	TBA	Chevalier College, Bowral
20-Apr-17	Public Lecture	Dr Robert Kennedy Cardiologist	Post mortem drug studies	Chevalier College, Bowral
18-May-17	Public Lecture	TBA	TBA	Chevalier College, Bowral
15-Jun-17	Public Lecture	Dr Michael Birrell	Egyptology	Chevalier College, Bowral
20-Jul-17	Public Lecture	TBA	TBA	Chevalier College, Bowral
17-Aug-17	Public Lecture	Hugh MacKay AO	The changing place of religion in Australia	Chevalier College, Bowral
21-Sep-17	Public Lecture	Prof Peter Schofield Neuroscience Research Australia	Alzheimer's Disease	Chevalier College, Bowral
19-Oct-17	Public Lecture	TBA	TBA	Chevalier College, Bowral
16-Nov-17	Public Lecture	TBA	TBA	Chevalier College, Bowral

*Lectures are the third Thursday of each month. **Location may change due to renovations

... *Continued from page 1*

Prof Adam Guastella to speak on Autism and Oxytocin

Professor Adam Guastella is a Principle Research Fellow in Sydney University's Brain & Mind Research Institute. Professor Guastella is clinical psychologist whose overarching interest is in using neuroscience to inform and develop novel treatments for young people with mental health problems. These include anxiety, autism, psychosis, and substance dependence.



Prof. Guastella initiated research that revealed the powerful effects of oxytocin administration on enhancing face-perception and the cognitive processing of social stimuli by humans. Subsequently, Prof Guastella's team was the first in the world to show that such medication can improve the social interactions of young children with autism. This research now being conducted at sites across Europe, Asia, and Australia focuses on identifying better who

responds to treatment plus the wider aim of understanding bonding and attachment.

Prof. Guastella has also treated over 400 young people with social anxiety. His program combines Cognitive-Behaviour Therapy with a pre-treatment of D-Cycloserine (DCS). Together, these integrated treatments have helped the young people extinguish their fears.

Anne Wood FRSN

Report of the 1249th OGM Wednesday, 7th December 2016

Presentation of Jak Kelly Award & Christmas Party

Dr. Matthew Barr

School of Mathematical and Physical Science,
Newcastle University

“Imaging with a Deft Touch: The Scanning Helium Microscope – A Modern Pinhole Camera!”



Dr. Barr receives the Jak Kelly Award from Irene Kelly

Dr. Matthew Barr received the The Jak Kelly Award as the winner of a competition conducted by the Australian Institute of Physics (NSW Branch). Among the candidates for the prize, Dr. Barr was judged to have made the best presentation. The award was created in honour of Professor Jak Kelly (1928 - 2012), who was Associate Professor of Physics at UNSW and also President of the Royal Society of NSW (2005 and 2006). The award's purpose is to encourage excellence in postgraduate research in physics.

After receiving the award, Dr. Barr delivered a most interesting talk on his work designing a new type of microscope. Inspired by the ancient pinhole camera, researchers have developed a technology to give new insights into the nature of matter. The scanning helium microscope makes it possible to generate images with fine details without the kind of damage to the delicate structures caused by traditional microscopes. For example, one can see the distinct flakes of chitin on a butterfly's wing that resemble plate armour, or the curve of a spider's fang.

Matthew recently completed his PhD at the University of Newcastle in the Centre for Organic Electronics. He specialises in microscope design and has a particular interest in free jet atomic and molecular beam sources. He also has experience in experimental vacuum science techniques, from vacuum system design through to x-ray techniques, and systems operation and analysis. In 2011, he received an Australian Nanotechnology Network travel fellowship that allowed him to travel to University of Cambridge. While there he was involved in the successful construction of a first-generation helium microscope.



ENGINEERS AUSTRALIA

Annual Meeting of the Four Societies

South Australia – A Nuclear State in a Global Solution

5.30pm for 6pm start - 8pm, Thursday 23 February 2017
International Convention Centre Sydney (Darling Harbour)



Rear Admiral, the Honourable Kevin Scarce AC CSC RAN (Rtd) COMPLEAust

Rear Admiral, the Honourable Kevin Scarce is the 16th Chancellor of the University of Adelaide

and was the 34th Governor of South Australia from 2007 to 2014. He served in the Royal Australian Navy from 1968, retiring in 2004. His appointments included service on HMAS Sydney during the Vietnam War.

Kevin also specialised in military logistics and procurement, rising to the rank of Rear Admiral and Head of Maritime Systems at the Defence Materiel Organisation. After retirement, as Head of the South Australian Defence Unit, he led a government team that contributed to ASC winning the contract to build air warfare destroyers for the Australian Defence Force.

Kevin was awarded the Conspicuous Service Cross in 1994, the Knight of Grace in the Venerable Order of Saint John in 2007 and a Companion of the Order of Australia in 2008.

Rear Admiral Scarce completed a Bachelor of Financial Administration

from New England, Masters of Management Economics at the University of New South Wales (Australian Defence Force Academy campus), and a Masters Degree in National Security Strategy at the US War College (National Defense University) in Washington, DC. He was awarded an Honorary Doctorate from Flinders University in 2009 for distinguished service to the public of South Australia and an Honorary Doctor of Letters (honoris causa) from the University of New England in 2014.

Kevin was appointed on 29 March 2015, as the Commissioner of the South Australia Nuclear Fuel Cycle Royal Commission.

Presentation

This talk will focus on the challenge to Australia in moving to a reliable, low carbon and lowest possible cost electricity system. Nuclear power is a proven, low carbon energy source and may have a role to play in Australia. South Australia has abundant uranium resources and furthermore, with the combination of geological, political and technical factors, the State may provide a global solution for the permanent disposal of used fuel. The benefits of being a Nuclear State could be game changing.

TICKETS

EA members, Society members & Non-members: Complimentary

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Schedule of RSNSW Events 2017

Date	Event	Speaker(s)	Topics and Presentations	Location
1-Feb-17	Ordinary General Meeting	Scholarship Winners 2016	Royal Society 2016 Scholarship Presentations	Union, University & Schools Club
1-Mar-17	Ordinary General Meeting	Richard Ferguson Australian National Maritime Museum	Captain Cook	Union, University & Schools Club
5-Apr-17	Annual General Meeting	Dr Greg Organ Chief Scientist, Lion Company	Science of Beer	Union, University & Schools Club
3/05/2017 Tentative	Annual Dinner	Prof. Peter Baume AC DistFRSN	Annual Dinner, Distinguished Fellows Lecture, and 2016 Award Presentation	Union, University & Schools Club
7-Jun-17	Ordinary General Meeting	Prof. Madeleine Beekman University of Sydney	Slime Mould	Union, University & Schools Club
5-Jul-17	Ordinary General Meeting	TBA		Union, University & Schools Club
2-Aug-17	Ordinary General Meeting	Prof. Ann Williamson FRSN University of New South Wales	Self Driving Cars: Will they help?	Union, University & Schools Club
6-Sep-17	Ordinary General Meeting	Dr. Helen Mitchell Conservatorium of Music	Complexity of Music	Union, University & Schools Club
4-Oct-17	Ordinary General Meeting	TBA		Union, University & Schools Club
1-Nov-17	Ordinary General Meeting	TBA		Union, University & Schools Club
6-Dec-17	Ordinary General Meeting	Jak Kelly Award Winner	2017 Jak Kelly Award Presentation & Christmas Party	Union, University & Schools Club

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For further information: <http://www.royalsoc.org.au/>

New Society Ties are Now Available For Purchase

New Society ties are now available for purchase for \$45 (exclusive of postage and credit card fees). If you wish to order one, please do the following:

1) Enter this URL into your browser

<https://nsw-royalsoc.currinda.com/register/event/29>

2) When the website opens, you should see “Sales of Silk Tie” under the “Royal Society of New South Wales” banner.

Either create a profile or login to your existing profile with your email address + your selected password.

3) When you see “You have not yet registered for this event,” press the **Register** button.

4) If you see, “Register your profile,” go to the bottom of the page, tick the box next to “I agree”, and press **Save and Continue**.

5) When you see “Confirm your membership details,” press **Continue**.

6) When you see “Select your registration type,” click on the button for either purchase + postal delivery (\$8.50 postage) or collection at next OGM. Then, tick the box next to “I agree...” and press **Continue**.

7) When you see “RSNSW Silk Tie » Add-ons,” select whether you want extra ties. (Select 0 if you want to just one tie.) Press **Continue**.

8) When you see “Payment details,” proceed to fill them in to complete purchase.

