



The Bulletin 412

The Royal Society of New South Wales

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For Your Diary:

11-17 August 2017

Sydney Science Festival

RSNSW Lunch Time Talks

Univ of Sydney Business School CBD Campus

See page 8 for details

17 August 2017

Southern Highlands Branch

Hugh MacKay AO

**“The changing place of religion in
Australia”**

6:30 pm, Thursday, 17 August 2017

Performing Arts Centre

Chevalier College, Bowral

See page 7 for details

4 September 2017

Joint Event

Susannah Fullerton

**“Samuel Pepys, His Library and the
Enlightenment “**

Mitchell Theatre, Sydney Mechanics School of
Arts, 280 Pitt St, Sydney, 6:00 for 6:30

See page 3 for details



Patron of The Royal Society of NSW

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

Open Lecture & OGM

Wednesday, 2 August

Professor Ann Williamson

“Self Driving Cars: Will They Help?”

Director

Transport and Road Safety Research Centre

School of Aviation, UNSW



Autonomous vehicles and driver assist technologies are seen as the next big thing in transport and road safety. Many authoritative organisations are predicting benefits of up to 95% reductions in road traffic crashes; levels never

Date: Wednesday, 2 August 2017; 6:00 pm 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: <https://nsw-royalsoc.currinda.com/register/event/35>

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

All are welcome.

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From the President

President's Column July 2017

The excitement of your President's month was a trip to Sao Paulo, Brazil to represent Australia at the General Assembly of the International Union of Pure and Applied Chemistry. Think the United Nations meets the Eurovision Song Contest for chemistry. We have a flag and a card with our four votes (the number of votes is proportional to the size of the chemical industry and runs 1 – 6), and our job in Council is to elect the next President-elect (Professor Chris Brett from Portugal), agree on the budget, and ratify decisions of the Bureau such as announcing the latest set of new elements (see my June column of last year). I have been elected Secretary to the Interdivisional Committee for Terminology, Nomenclature and Symbols (ICTNS) – the ultimate authority on the language of chemistry world-wide, and the Star Chamber of IUPAC. More on our updating of the IUPAC Gold Book another time.

Sao Paulo is not the prettiest of cities, but we had no problems getting about. Indeed, young people on the metro positively flung themselves from their seats to give them to us older members.

49 In indium 114.82	50 Sn tin 118.71	51 Sb antimony 121.76	52 Te tellurium 127.60(3)	53 I iodine 126.90	54 Xe xenon 131.29
81 Tl thallium 204.38	82 Pb lead 207.2	83 Bi bismuth 208.9804(1)	84 Po polonium [209]	85 At astatine [210]	86 Rn radon [222]
113 Nh nihonium [284]	114 Fl flerovium [289]	115 Mc moscovium [288]	116 Lv livermorium [293]	117 Ts tennessine [294]	118 Og oganeson [294]

The bottom corner of the Periodic Table of the Elements showing the new elements, which complete period 7. For a full and correct periodic table as a pdf see: http://iupac.org/cms/wp-content/uploads/2015/07/IUPAC_Periodic_Table-28Nov16.pdf.



I am looking forward to giving my Sydney Science Festival talk “Crooks, Cranks and Charlatans”, a meander through the history of Scientific Fraud, by accident, delusion or design, from medieval self-blowing windmills to some of the latest excesses of fame- and grant-hungry scientists. See <https://sydneyscience.com.au/2017/event/science-fraud/>. Look out, too for a fringe event in Parramatta, at the University of New England's FutureCampus (<https://www.une.edu.au/study/study-centres/futurecampus-parramatta>) on Wednesday 16 August 2.00 – 3.00 pm, “Everyone needs science in their lives”. This will be an exploration of educational approaches with our noble editor of the Bulletin Jim Kehoe speaking. You might recall his OGM presentation in November last year on advances in instructional design.

Congratulations to Professor Mark Taylor FRSN, Scientia Professor Dennis Del Favero FRSN and Associate Professor Muireann Irish FRSN for their election to fellowship of the RSNSW. We look forward to welcoming them at a forthcoming OGM.

The next OGM on Wednesday 2 August should see a fascinating talk by Professor Ann Williamson FRSN on “Self-driving cars: Will they help?” Knowing Ann to be a deeply sceptical scientist I suspect the best we might do for an answer is ‘maybe’.

Planning for the RSNSW and Four Academies Forum (The future of Rationality in a Post-Truth World, Government House, Wednesday 29 November 2017) goes apace. We expect to announce the list of speakers and topics very soon.

As usual, please write with comment and suggestions to president@royalsoc.org.au.

Is the Enlightenment Dead?

A Lecture Series Co-hosted by
the Royal Society of New South Wales and
the Sydney Mechanics School of Arts

These four Lectures will describe the beginnings of the Enlightenment, its impact on Colonial Australia, and the development of two key portals of the Enlightenment – specifically, the library and museum – over 200 years. The series will conclude with an interactive sophistry taking the themes of the series, and discussing them in the context of contemporary Australian life. The lectures will be presented by an outstanding group of experts in the field, with the topics chosen to represent a broad overview of the Enlightenment and its continuing worldwide impact.

This series is jointly hosted by the Royal Society of NSW and the Sydney Mechanics School of Arts. Thus, the series brings together the two oldest institutions in NSW dedicated to education, the discussion of ideas, and discovery. The series is intended to initiate continuing interactive events and activities to the mutual benefit of both societies.

The Enlightenment was founded on reasoned discourse and scientific enquiry, connecting them to the idea of human equality and the rights of the individual. It has had a powerful influence through disruptive revolutions in 18th-century European and American societies. But what influence did it have on our Australian society, and the institutions entrusted to inform the population of new ideas and discovery? On a contemporary note, to what extent is Nobel Laureate Joseph Stiglitz correct in contending that “Global deflation is reversing international progress through rejection of the principles of the Enlightenment”.



The lectures will be held at the Mitchell Theatre, Level 1, Sydney Mechanics School of Arts, 280 Pitt St, Sydney, 6:30 pm to 7:30 pm (drinks at 6:00 pm). Entry for each lecture: \$15 for Members and Fellows, \$20 for non-members.

Monday, 4 September 2017: “Samuel Pepys, His Library and the Enlightenment.” Susannah Fullerton
Monday, 6 November 2017: “What the Enlightenment Meant to Australia.” John Gascoigne
Thursday, 1 February 2018: “Learning, Adaptation and the Enlightenment: The Museum.” Kim McKay
Thursday, 1 March 2018: “Learning, Adaptation and the Enlightenment: The Library.” Paul Brunton
Thursday, 5 April 2018: “Sophistry: “Global Deflation: The Enlightenment has Failed!” George Paxinos

Southern Highlands Branch Lecture, 20 July 2017

Dr Wes Stein

“Smoke and Mirrors – Where to for Clean Energy”

Dr Wes Stein is the Chief research scientist for solar energy at the CSIRO and the Director of the Australian Solar Thermal Research Institute (ASTRI). He has led technology development and strategic thinking in this area in Australia for the last twenty years and has been responsible for research projects valued at over \$50 million at the National Solar Energy Centre, Newcastle, NSW. Dr Stein represents Australia on the International Energy Agency’s SolarPACES and other international bodies. Prior to joining CSIRO he worked with Pacific Power in the power industry for twenty years.

Dr Stein’s lecture attracted an audience of over 60 people and judging from the enthusiastic question time, which had to be curtailed, they were intensely interested in the energy situation at present and the variety of new options unfolding to supply clean, affordable, reliable and safe heating and power to households and industry.

We are living in a period of high change in the energy industry. Previously, energy services have been something we take for granted, but now it seems to steadfastly take up front page news. In the current debate, it is difficult to make sense of what is “clean,” what is reliable and why our power bills are increasing so rapidly. Dr Stein’s lecture reviewed Australia’s current situation, some basics of energy systems and some options for the future.

One observation clearly articulated by Dr Stein was that there will be no one “solution” or energy technology that will solve all our energy problems. Rather, our energy requirements will be satisfied by a broad mix of technologies and systems, each used as appropriate by location



and development time. This mix will change over time as the various technologies improve and basic and relative costs change. We need to have all options open to assist in finding the most cost-effective path forward.

After canvassing the various energy technology options suitable for the Australian situation, Dr Stein discussed his current R&D development activity, concentrated solar thermal (CST) heat collection with storage of that heat for later power generation. In this way, solar energy can be supplied around the clock and make the solar energy “dispatchable”; that is, available on demand, thus overcoming one of the difficulties with the main sources of renewable energy – they have a variable output. It should be noted that the Finkel Report says that if new

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Self Driving Cars: Will They Help?

achieved before. Unfortunately, these forecasts are at best optimistic and at worst misleading as they are based on the false ideas that driver error is at the heart of almost all road safety problems and that new technology is infallible. This presentation will summarise the main issues with the introduction of autonomous vehicles using examples from aviation and road transport.

Prof. Williamson will also discuss why we need to act now to refocus the introduction of new technology in vehicles towards making them more usable tools for people if we are to maximize their benefits.

Prof. Williamson is currently Director of the Transport and Road Safety (TARS) Research Centre and Professor of Aviation Safety at UNSW Sydney. She is a Fellow of the Royal Society of NSW and of the Australian College of Road Safety. She has a PhD in Psychology, was Foundation Director of the

NSW Injury Risk Management Research Centre and previously Head of the Human Factors and Ergonomics Unit at the National Institute for Occupational Health and Safety. Her research focuses on human factors and injury in the areas of transportation and workplace safety, in particular on the role of error, especially skill-based error, in safety and the effects of fatigue on performance.

Prof. Williamson has been an invited technical expert on advisory committees for a wide range of transport and road safety authorities. She has twice been awarded an NHMRC Senior Research Fellowship (2005-2015) and won the Ron Cumming Memorial medal from the Human Factors and Ergonomics Society of Australia (2013), the Sustained Achievement over a Professional Career Award (2011), the Meritorious Achievement in Research Award (2004) and was President of the Australian Injury Prevention Network.



Dr Wes Stein

“Where to for Clean Energy”

dispatchable capacity is not brought forth soon, the National Electricity Grid’s reliability would be compromised. Dr Stein’s work offers a potential contribution to the increased use of large scale renewable energy in the national electricity market without compromising dispatchability.

The CST plus storage technology involves the use of steerable, shaped mirrors that track the sun and concentrate the solar radiation onto collectors atop a tower or towers. The radiant heat is used to melt salt mixtures and heat the mixture up to 600C for storage in large tanks. The heat is withdrawn for power generation and other uses as desired. There are several plants of this type in the US and Spain and planning is underway for large scale systems to be built in Australia with

Australian-developed collector fields and tower designs.

As with all new technologies in a fast moving area, there will be strong competition to CST with storage power stations such as the combination of solar PV and batteries/wind and batteries, and CST will need to be kept on its toes to be competitive. However, CST with storage promises to be one of the lowest cost forms of dispatchable energy supply currently. Its wide spread use could underpin the further growth of solar PV and wind, highlighting a systems approach to a new energy era.

Dr John Wright AM FRSN

Upcoming Southern Highlands Branch Lecture, 17 August 2017

Hugh Mackay AO

“The Changing Place of Religion in Australia”

6:30 pm start, Performing Arts Centre, Chevalier College, Bowral

Hugh Mackay is a social researcher and the author of 16 books – 10 in social psychology and ethics, and 6 novels. His latest book, *Beyond Belief*, was published in 2016.

In recognition of his pioneering work in social research, he has been elected a Fellow of the Australian Psychological Society and awarded honorary doctorates by Charles Sturt, Macquarie, NSW and Western Sydney universities.

A newspaper columnist for over 25 years, Hugh is currently an honorary professor of social science at the University of Wollongong, an adjunct professor in the faculty of arts at Charles Sturt University, and a patron of the Asylum Seekers’ Centre. He was previously deputy chairman of the Australia Council, chairman of trustees of Sydney Grammar School and the inaugural chairman of the ACT government’s Community Inclusion Board. In 2015, Hugh was appointed an Officer in the Order of Australia. See <http://www.hughmackay.net.au/about-hugh-mackay/>





RSNSW Lunch Time Science Talks
Univ of Sydney Business School CBD Campus
Level 17, Stockland Building, 133 Castlereagh St.
Free Admission



“Smoking and lung Cancer: How are we Doing?” – Professor John Murray
School of Mathematics and Statistics UNSW
12.30 – 1.30pm, Friday 11 August 2017
What are the rates of smoking and lung cancer these days – are we doing better? Hear Professor John Murray share some of his extensive research in this field and learn what the latest evidence means for our future.
<https://sydneyscience.com.au/2017/event/smoking-and-lung-cancer/>



“Fred Astaire and the Science of Spontaneity” – Dr. Kathleen Riley
Writer, classical scholar and theatre historian
12.30 – 1.30pm, Monday 14 August 2017
Dr Kathleen Riley will focus on the science behind superstar Fred Astaire’s ability to make the technically complex and endlessly rehearsed look simple, spontaneous, and effortless. The talk draws on her book *The Astaires: Fred and Adele*. <https://sydneyscience.com.au/2017/event/fred-astaire/>



“Personalised Medicine: Healthcare in the 21st Century” – Associate Professor Kristine Barlow-Stewart
Genetic Medicine, Northern Clinical School, University of Sydney
12.30 – 1.30pm, Tuesday 15 August 2017
The ability to know a patient’s most personal information contained in their DNA is increasingly informing treatments and revolutionising health policy. Explore this revolution and discuss how governments must develop the strategies for a healthcare system that takes advantage of these new opportunities.
<https://sydneyscience.com.au/2017/event/personalised-medicine-and-you/>



“Scientific, and not so Scientific Fraud: Crooks, Cranks and Charlatans” – Emeritus Professor Brynn Hibbert, School of Analytical Chemistry, UNSW
12.30 – 1.30pm, Thursday, 17 August 2017
The use of science to sell strange and fraudulent information is not new. Join Professor Brynn Hibbert, President of The Royal Society of NSW, and learn some of the wackier examples of scientific and not so scientific fraud, starting in the Middle Ages in Europe and continuing in Sydney in the 21st Century.
<https://sydneyscience.com.au/2017/event/science-fraud/>

Schedule of RSNSW Meetings 2017

Date	Event	Speaker	Topics and Presentations	Location
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	Prof. Pip Patterson	Science of Social Networks	Union, University & Schools Club
1-Nov-17	Ordinary General Meeting	Pamela Griffith FRSN	Women in Art	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

RSNSW - Southern Highlands Branch

Date*	Event	Speaker	Topic	Location**
17-Aug-17	Public Lecture	Hugh MacKay AO	The changing place of religion in Australia	Chevalier College, Bowral
28-Sep-17	Public Lecture	Prof Peter Schofield	Alzheimer's Disease	Chevalier College, Bowral
19-Oct-17	Public Lecture	Prof Dean Rickles	Quantum Gravity	Chevalier College, Bowral
16-Nov-17	Public Lecture	Yik Lung (Jeremy) Chan	Effects of Maternal Cigarette Smoke Exposure	Chevalier College, Bowral

*Lectures are usually the third Thursday of each month, except September. **Location may change

RSNSW & The Sydney Mechanics School of Arts

Date*	Event	Speaker	Topic	Location**
4-Sep-17	Public Lecture	Susannah Fullerton	Samuel Pepys, His Library and the Enlightenment	Sydney Mechanics School of Arts***
6-Nov-17	Public Lecture	John Gascoigne	What the Enlightenment Meant to Australia	Sydney Mechanics School of Arts***
1-Feb-18	Public Lecture	Kim Mckay	Learning, Adaptation and the Enlightenment: The Museum	Sydney Mechanics School of Arts***
1-Mar-18	Public Lecture	Paul Brunton	Learning, Adaptation and the Enlightenment: The Library.	Sydney Mechanics School of Arts***
5-Apr-18	Public Lecture	George Paxinos	Sophistry: "Global Deflation: The Enlightenment has Failed!"	Sydney Mechanics School of Arts***

***Mitchell Theatre, Level 1, Sydney Mechanics School of Arts, 280 Pitt St, Sydney

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