



# The Royal Society of New South Wales Bulletin and Proceedings 337

ABN 76 470 896 415

ISSN 1039-1843

July 2010

## Future Events 2010

Lectures in Sydney are held in Lecture Room 1, Darlington Centre, University of Sydney at 7 pm on the first Wednesday of the month with drinks available from 6 pm.

Wednesday 4 August 2010 at 7 pm

**Professor Peter Robinson**

### The Dynamic Brain: Modelling Sleep, Wake and Activity in the Working Brain

(see details at right)

Wednesday 1 September 2010 at 7 pm

**Dr Ken McCracken**

### Long-term changes in solar activity - including the current "Grand Minimum"

## Southern Highlands Branch

Meetings are held on the third Thursday of each month in the Drama Theatre at Frensham School, Mittagong (enter off Waverley Parade), at 6.30pm.

### next talk

Thursday 19 August 2010, at 6.30pm

**Dr Michael Birrell**

(see details at right)

## Central West Branch next talk

Friday 20 August 2010, at 6pm

**Dr Alex Ritchie**

(see details page 3)

## Unidentified Member Payment

We received a membership payment in March which we cannot identify. Instead of a name or membership number we were provided with the following detail: kmb. If this means anything to you and you are still receiving reminder notices please contact Sonia Chan at the office to provide details of your payment.

Bulletin Editor, Bruce Welch

## Lecture 4 August 2010, Darlington Centre at 7pm

**Professor Peter Robinson**

### The Dynamic Brain: Modelling Sleep, Wake and Activity in the Working Brain

The brain's activity varies around the clock in response to stimuli, light inputs, and the build-up and clearance of sleep-promoting chemicals — somnogens. Signatures of brain activity have been observed for over a century and are widely used to probe brain function and disorders. These are recorded via the electroencephalogram (EEG) by electrodes on the scalp, or through functional magnetic resonance imaging (fMRI), which measures a combination of blood volume and deoxygenation. This talk will present a quantitative physiologically based model of the working brain that responds correctly to the day-night cycle, somnogens, caffeine and pharmaceuticals. The model generates activity in the cortex that is consistent with brain imaging measurements. Successful applications to numerous experiments are described, including EEGs, seizures, sleep deprivation and shift work. Aside from its scientific uses, this working brain model is currently finding clinical and industrial applications to brain function measurement and to prediction and monitoring of alertness.

Professor Peter Robinson received his PhD in theoretical physics from the University of Sydney in 1987, then held a postdoc at the University of Colorado at Boulder until 1990. He then returned to Australia, joining the permanent staff of the School of Physics at the University of Sydney in 1994, and obtaining a chair in 2000. He is currently an Australian Research Council Federation Fellow working on topics including sleep, brain dynamics, space physics, plasma theory, and wave dynamics.



## Southern Highlands Branch Lecture

**Dr Michael Birrell**

Thursday 19 August 2010, at 6.30pm

Dr Michael Birrell is a PhD graduate from Macquarie University in the field of Egyptology with a special interest in ancient cults and government.

He has worked as an archaeologist in Egypt and Israel for the past 20 years. He teaches classes at the WEA and Sydney University Summer School and is a tutor at Macquarie University. He also runs

historical study tours to the ancient world with his company, BC Archaeology.



## Patrons of The Royal Society of NSW

**Her Excellency Ms Quentin Bryce AC**

**Governor-General of the Commonwealth of Australia**

**Her Excellency Professor Marie Bashir AC CVO Governor of NSW**

## Meet your new Councillors

### Dr Frederick Osman

Dr Osman is an active executive member of several professional societies such as the Australian Institute of Physics, Australian College of Educators, the NSW Teachers Guild and now the Royal Society of NSW. He is currently the President-elect and recognized as a Fellow of the Australian College of Educators for his outstanding leadership as a teacher in both tertiary and secondary sectors in the areas of maths and physics and for the development of effective and novel means of developing the capacity of beginning teachers and their mentors. Fred has also served as the Chair of the Australian Institute of Physics (NSW branch from 2008 and been involved with other AIP roles for the last 10 years) and is currently the Vice President of the NSW Teachers Guild.

He has had more than 20 years academic/industry experience in innovative teaching and researching, in Physics and Mathematics education at Tertiary, Secondary IB/HSC & TAFE institutions. Along with his teaching knowledge and hands on research experience and innovation, he has been required to work and manage projects independently and cross functionally involving the development, implementation and evaluation of a range of high quality education programs and activities across the NSW schools, community and industry sectors.



As a researcher he has published many papers in major international journals and conferences and has contributed to various teaching/learning reports/interviews for the media. His research background and achievements have been attained in laser plasma interaction for inertial confinement fusion including work on several plasma effects; nonlinear force of ponderomotive, relativistic optical constants, the genuine two-fluid hydrodynamic model, and the prediction and solution of the pico-second stochastic pulsation process of laser plasma interactions. He is also currently working in the area of soliton geometry together with the admittance of Darboux and Bäcklund transformations of soliton surfaces.

## Call for nominations of Fellows of the Royal Society of NSW

Fellowship of the Royal Society of NSW (FRSN) may be awarded from time to time for very distinguished services to science, engineering, medicine, education and related topics, predominantly performed in NSW. The first seven Inaugural Fellows of the Society were announced in October 2009 and their awards conferred at a ceremony in Admiralty House on 29 March 2010, presided over by the Governor-General, Her Excellency Ms Quentin Bryce AC, who is also Chief Patron of the Society. A brief report of this event can be found in Bulletin 334 of April 2010.

Members of the Society are now invited to forward, in strict confidence, proposals for a limited number of further Fellowships, to the President of the Society. Nominations should include supporting evidence of the candidate's outstanding contributions to the above areas of knowledge and indicate where and from whom further information may be obtained for the careful and detailed selection processes of the Society. Submissions to the President, Mr John Hardie, are now invited with a closing date of 15 September 2010. Submissions require a covering acceptance form obtainable by contacting the Society's office.

Prof. Heinrich Hora for the Selection Committee of Council

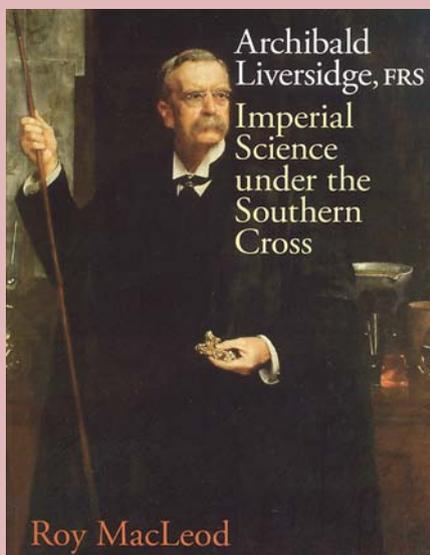
## Liversidge Book - Special member's Discount

The Council has decided to offer a 10% discount to Members on this superb book. It is a joint publishing effort between the Society and Sydney University Press

This book is a detailed narrative of the progress and beginnings of scientific inquiry in Australia.

For anyone interested in Archibald Liversidge, his contribution to crystallography, mineral chemistry, chemical geology, strategic minerals policy and a wider field of colonial science.

Now \$54 collected or \$65 posted (within Australia)



## New Members

Four new members were announced at the July meeting of the Society:

Michele Herrington - Full Member  
John Herrington - Full Member  
Laurel Dyson - Full Member  
Jacquelin Grant - Full Member

We welcome them into the Society.

## From the President



I have been busy with a range of matters over the past month and unfortunately missed the talk by Professor Fred Watson, which I was really hoping to catch. I believe it was an excellent talk.

One of the events I was able to attend was the launch of Elizabeth Ellis's new book *Rare and Curious: The Secret History of Governor Macquarie's Collectors' Chest* at the State Library of NSW by our patron, Her Excellency Professor Marie Bashir, Governor of NSW. She had just come from proroguing the Commonwealth Parliament and issuing the writs for an election in her capacity as Administrator of the Commonwealth

with the Governor-General being present in France for the Fromelles ceremonies.

Elizabeth is a member of our Society and has been a strong supporter of the work needed to preserve and maintain the Society's collection. Her book, published by Melbourne University Press under the Miegunyah imprint, is a wonderful work, giving insights into the nature of thinking on scientific matters in the early part of the nineteenth century.

The Macquarie collectors' chest was created in Australia for Governor Lachlan Macquarie in around 1818. It is a wooden cabinet filled with painted panels and exotic treasures. It was taken to the UK, and languished in a Scottish castle until it was rediscovered in the late 1970s. The Mitchell Library acquired the chest shortly thereafter, and its remarkable similarity to the Dixson Galleries collectors' chest, acquired by the Library in 1937, raised intriguing questions about the cabinets' creators, owners and purpose. Elizabeth became fascinated and embarked on several years' research to uncover the chests' secrets. This remarkable book is the result. I would like to congratulate Elizabeth on her outstanding achievement.

John Hardie

## Central West Branch

### next talk

Friday 20 August 2010, at 6pm

**Dr Alex Ritchie**



Australian palaeontologist, Dr Alex Ritchie, will be the next guest speaker in the public lecture series being run by the Central West Branch of the Royal Society of NSW.

Dr Ritchie's talk will be held on Friday August 20 in the West Room of the Orange Regional Gallery beginning at 6pm. The cost, which includes light refreshments, is \$3 for Royal Society members and \$5 for non-members. For bookings, contact Mark Filmer ([mfilmer@csu.edu.au](mailto:mfilmer@csu.edu.au)) or Kerry Madden ([kmadden@csu.edu.au](mailto:kmadden@csu.edu.au)).

## Lecture delivered for the Society's 1182nd Ordinary General Meeting held on 7 July 2010

### Pluto and the Über-nerds

#### Dr Fred Watson, Australian Astronomical Observatory

At the end of the 19<sup>th</sup> Century, anomalies in the orbits of Uranus and Neptune led some astronomers to believe that there was an unknown "planet X" in the outer reaches of the solar system that was tugging these gas giants. Mathematicians calculated the probable position of this new planet and astronomers searched for decades without success. After more than a year's arduous searching, Clyde Tombaugh announced in 1930 that he had found planet X in its expected position. The prediction and discovery of the new planet Pluto was hailed as a great triumph for astronomy and physics.

Initial measurements suggested that Pluto was bigger than the earth and more than large enough to cause the observed orbital anomalies for Uranus and Neptune. However, as Dr Fred Watson explained to a very interested audience of 40 at the July OGM, all was not what it seemed. First, as technology advanced, new and better measurements of Pluto showed that it was smaller than expected. Every time the technology improved, Pluto shrank until now we know it is only 18% of the radius of the Earth with a puny 0.21% of Earth's mass. So did other strange objects cause the deviations? No. It turned out that the orbital anomalies were just measurement errors.

So astronomers were left with a tiny planet with a wispy atmosphere of nitrogen and a large moon, Charon, fully half the sized of Pluto. In fact Charon is so big that some argued that the Pluto-Charon system was really a binary planet.

In the 1990s astronomers started discovering large icy objects beyond the orbit of Neptune. Systematic searches kept discovering bigger and bigger ice balls that looked more and more like Pluto. In 2005 the trans-Neptunian object 136199 Eris was discovered which turned out to be 27% more massive than Pluto. No one wanted to call Eris a planet, so what was the justification for calling the puny Pluto one?

In 2006 the International Astronomical Union declared that Pluto was not a planet, it was just a dwarf planet. This demotion caused a public outcry and protests that the über-nerds were taking over. So in 2008 the IAU decided that the term "plutoid" would henceforth be used to describe Pluto and other similar objects that orbit beyond Neptune and have enough mass to be of near-spherical shape. Pluto may no longer be a full planet, but its name lives on.

Jim Franklin,  
Councillor, Activities Coordinator

## Fresh Approach to Education (FATE 2010)

### A Teaching and Learning Forum for New and Accomplished Educators

17 September 2010 - 19 September 2010

The Fresh Approach to Education forum will focus on how innovation can be encouraged, creative solutions enabled and new arenas embraced in education. It will also encourage a revisit of old ideas in new contexts, or old solutions to new problems. Pedagogies and practices will be explored, with a focus on their practical application.

Key themes of the forum include:

- \* using learning spaces, both old and new, creatively
- \* employing immersive technology to best effect
- \* harnessing learning technologies to benefit learning
- \* recycling effective approaches in new or different contexts
- \* enabling cross-fertilisation of good practice across disciplines and between institutions and
- \* developing networks of practice.

For NSW teachers accredited at Professional Competence, participation in this conference could be counted towards your Teacher Identified professional development. This would need to be validated by your teacher accreditation authority or their delegate (usually your principal).

#### REGISTRATION INFORMATION (all prices include GST)

\*\*EARLY BIRD - SAVE 40%\*\* (Only applicable for bookings made prior to 7 August 2010.)

Please visit the following web link

[http://austcolled.com.au/event/NSW\\_FATE2010](http://austcolled.com.au/event/NSW_FATE2010) to download a registration form and view ticket prices.

Bookings can be made for the full conference or for particular days only.

\*Member rates apply for members of ACE, Teachers Guild of NSW and Royal Society members.

#### INCLUSIONS

- \* Friday booking includes lunch, afternoon tea and seafood dinner buffet
- \* Saturday booking includes morning tea, lunch, afternoon tea & 3 course dinner reception (smart casual)
- \* Sunday booking includes morning tea and lunch
- \* Full conference booking includes all of the above

#### LOCATION

Sunnybrook Hotel & Function Centre, 355 Hume Highway Warwick Farm NSW, Australia

#### CONTACT

EVENT CONTENT: Dr Fred Osman: 0418 444 477 / [fred\\_osman@exemail.com.au](mailto:fred_osman@exemail.com.au)

REGISTRATION: Laura Cheail: 1800 208 586 / [laurac@austcolled.com.au](mailto:laurac@austcolled.com.au)

WEBSITE: [http://austcolled.com.au/event/NSW\\_FATE2010](http://austcolled.com.au/event/NSW_FATE2010)

Close registrations: 10 September 2010

Royal Society Members Price: \$325.00

Regular Price: \$455.00

Frederick Osman

## 2010 Einstein Lecture

### Quantum Physics:

### Einstein's Unruly Child

Dr Phil Dooley

Monday 23 August

6:00pm for 6:30pm start

Powerhouse Museum, cost free.

Online bookings essential at <http://www.powerhousemuseum.com/bookings/usf/einstein.php>

### Australian Institute of Physics NSW Branch



Wednesday 4 August 2010 @ 6.30PM

### Time, Einstein and the coolest stuff in the Universe

Speaker: Dr William D. Phillips, National Institute of Standards and Technology and the University of Maryland

Location of talk: The Seymour Centre, University of Sydney

Cost: \$20 Adults/\$15 Concession/free for Sydney Uni staff, students and Alumni (ID required)

Details can be found at the following URL: [http://sydney.edu.au/sydney\\_ideas/lectures/2010/professor\\_william\\_d\\_phillips.shtml](http://sydney.edu.au/sydney_ideas/lectures/2010/professor_william_d_phillips.shtml)

### RACI News

Weekly E-News (including forthcoming events) of The Royal Australian Chemical Institute Inc. NSW Branch are obtainable on their web site at <http://www.chem.unsw.edu.au/raci/News.html>



#### Contact your office bearers

John Hardie President	02 9363 9360	Prof Heinrich Hora Vice President	02 4627 7769
Clive Wilmot Vice President	02 4886 4199	Bruce Welch Hon. Secretary (General)	02 9569 9928
Prof Jak Kelly Hon. Secretary (Editorial)	02 9419 6877	Marian Haire Hon Treasurer	02 8467 3575
Alan Buttenshaw	02 9569 0236	Jim Franklin	02 9514 2195
Julie Haeusler	0410 320 776	Dr Don Hector	02 9484 4378
Prof. D Brynn Hibbert	0411 286 480	Brendon Hyde	02 9498 3520
Dr Michael Lake	02 9514 2238	Dr Frederick Osman	0418 444 477
A/Prof Bill Sewell	02 9295 8434	Prof. Bruce A Warren	02 9665 7537
Clive Wilmot - Southern Highlands Rep.	02 4886 4199	Prof Kevin Parton - Central West Rep.	02 6365 7500

The Bulletin and Proceedings is issued monthly by the Royal Society of New South Wales  
Address: 121 Darlington Rd, Building H47, UNIVERSITY OF SYDNEY, NSW 2006, AUSTRALIA

Phone: 61 2 9036 5282 • Fax: 61 2 9036 5309

Sonia Chan, Administrative Assistant

Email: [royalsoc@usyd.edu.au](mailto:royalsoc@usyd.edu.au) • Web page: <http://nsw.royalsoc.org.au>