



ABN 76 470 896 415

# The Royal Society of New South Wales

*"for the encouragement of studies and investigations in Science Art Literature and Philosophy"*

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## NEWS & EVENTS 2011

### Governor's Reception for Lord May of Oxford

The Society was honoured by the decision of our Patron, Professor Marie Bashir, Governor of NSW, to hold a reception at Government House, Sydney for the formal investiture of Lord May of Oxford, a distinguished Australian scientist now residing in the UK, as Fellow of the Society. This took place in the late afternoon of Friday 29 April 2011 following Lord May's delivery of the Dirac Lecture at the University of NSW that morning. The presence at the event of several leaders of the scientific community in NSW was testament to the value that is placed on excellence and achievement in science, and on the importance of the Society's Fellows.



Lord and Lady May (centre) with Her Excellency the Governor and the President following Lord May's investiture as Fellow of the Society at Government House Sydney.

**Fellows: Michael Archer AM FAA FRSN; Elizabeth Blackburn AC FRS FRSN; Robert Clark FAA FRSN; David Craig AO FRS FAA FRSN; Jak Kelly DSc FInstP (London) FRSN; Kurt Lambeck AO FRS FAA FRSN; Eugenie Lumbers FAA FRSN; Lord May of Oxford OM AC Kt FRS FAA FRSN; Michelle Simmons FAA FRSN; Richard Stanton AO FAA FRSN; Bruce Warren DSc FRCPA FRCPath FRSN**

**Dirac Lecture**  
**Beauty and Truth: their Intersection in Mathematics and Science**  
**Robert Lord May of Oxford OM AC FRS FAA Kt FRSN**

On 29 April 2011, Robert Lord May of Oxford, arguably the greatest mathematician that Australia has produced, presented the Dirac Lecture at the University of New South Wales, jointly sponsored by the Society. He took us on an interesting exploration of some of the important concepts of mathematics, from Euclidean geometry via the concept of imaginary numbers to the mathematics of fractals and chaos theory and the extraordinary power of mathematics to describe observed real-world phenomena. Updating the observation by Galileo, "this grand book is written in the language of mathematics, and its characters are triangles, circles and other geometric objects", Lord May pointed out that rather than triangles and circles, today the mathematical objects are more likely to be fractals and "strange attractors". Nonetheless, as Galileo observed, and referring to the examples of Julia sets and Mandelbrot sets, there is great beauty in the elegance with which we can both describe and understand the immense complexity of the universe. He went on to explore the paradigm shift that Einstein divined from the results of the Michelson-Morley experiment that had found that the speed of light was the same for all observers. Einstein's formulation of the special theory of relativity led to a profound shift in our understanding of the relationships between momentum, mass and energy that has enabled extraordinary insights and understanding of the nature of the universe, from gravity to nuclear fission.

Lord May pointed out that, regrettably, many of the great contributions do not get the recognition that they deserve. In his view, Paul Dirac was such a person – his formulation of the Dirac equation and its implication of the existence of positrons was one of the greatest steps forward in theoretical physics in the 20th century, yet his name is nowhere near as well known as that of Einstein.

Quoting Keats "beauty is truth, truth beauty – that is all ye know on earth and all ye need to know", Lord May observed: well yes, but not really.



Lord May delivering the Dirac Lecture.



L to R Dr Fred Osman, Em. Prof. Heinrich Hora, Lord May and the President after the Dirac Lecture.

## President Delivers Occasional Address

The Society's President was honoured with the opportunity to address new graduates and their families and friends at a graduation ceremony held at the University of Sydney on Friday 20 May 2011. The ceremony was for the Faculty of Science and for the Faculty of Engineering and Information Technologies, and was presided over by the university's Chancellor, our Patron, Her Excellency Professor Marie Bashir. Over 200 new graduates had their degrees conferred, with the majority coming from the Science Faculty.

In his Occasional Address the President referred to the importance of communicating science to a wider audience by all who practise it. He also referred to the value of scientific professional associations and learned societies, particularly as a means of enabling science communication. He cited Professor Archibald Liversidge, the first Dean of Science at the university and a mainstay of the Society for the last quarter of the nineteenth century, as an embodiment of the broad approach that needs to be taken by all, especially today.

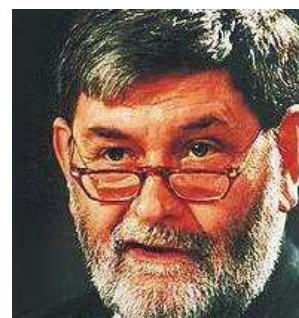
## Barry Jones and David Malouf at the Royal Society Belief and Science: the Belief/Knowledge Dilemma

**Wednesday 6 April 2011**



David Malouf

Have scientists become polarised into the believers and non-believers? Barry Jones posed this question to David Malouf and members of the Society at our meeting on Wednesday, 6 April 2011. Reflecting upon this, Barry referred to the scientific paradigm that has emerged over the last several hundred years: scientists gather information in order to



Barry Jones

try to make sense of observed phenomena using rational analysis. Science has evolved to

become not so much a matter of belief but rather of acceptance of the most sensible explanation based on the accumulation of evidence. Nonetheless, when major paradigm shifts in scientific thinking take place, there are often eminent experts who disagree and refuse to accept the new theory. This slows down the acceptance of a new paradigm but ultimately in most cases rational thought prevails.

David Malouf pointed out that non-scientists have to rely on what they are told in order to evaluate scientific theories. He pointed out the significant shift since the 18th century when early scientists put their theories to learned academies (such as the Royal Society, London) for expert examination and they determined what was accepted as scientific knowledge and what was rejected. Today, however, with the highly complex issues that society faces there are significant public policy implications that need to be resolved based on expert advice. But what do we do when the experts disagree? We are largely dependent on the media to inform us. This is further complicated because important issues are usually not just scientific in their nature but often have economic and social imperatives that commercial groups, governments and other interests seek to manipulate. Barry commented that the sheer complexity of science has forced scientists to increasing specialisation. Furthermore, scientists are heavily reliant on research grants from government and private enterprise and this has discouraged them from entering into

controversies. This is quite different to the era of only 50 or 70 years ago when renowned scientists were not afraid to comment outside their area of specific expertise.

David referred to the great advances that were made in the 17th, 18th and 19th centuries, for example, by Kepler, Newton, and Darwin. Darwin's book, "On the Origin of Species" was very readable but most science in the 20th century has become so complex that it is not able to be so readily accessible to the layman. Furthermore, whereas once scientific advances were often made by one person, nowadays it is far more likely for the work to be attributable to a team of scientists and it is often the "front man" who gets the Nobel Prize! Science is often seen to be different from other subjects but that is not really the case – it just requires a different mindset. Barry referred to the mindset underlying creationism in the US, pointing out that often a deep-seated belief cannot be shaken by debate and discourse. Nonetheless, articles on science and the relationship between science and belief in popular magazines and newspapers are important. Writers like Richard Dawkins and Stephen Hawking had not only popularised science but through their lucid writing had brought important arguments to a large public audience.

In their final comments, Barry emphasised that the task of a scientist is to analyse inconceivably complex data and make sense of it but the public policy imperatives are driven by media outcomes and necessarily requires the debate to be simplistic. David is fascinated by the rate of change of technology and almost unexpectedly has come to the realisation that the more we know about the complexities of nature, of the human body, the weather and so on, it simply exposes ever more questions. Science has been enormously successful and exciting in bringing an understanding in a world that we know so little about.

## Annual Dinner and Awards

The Society held its Annual Dinner for 2011 at St Paul's College, University of Sydney on Friday 18 February 2011. Our guest-of-honour was the Governor of NSW, Her Excellency Professor Marie Bashir AC CVO, one of our two Patrons and a long-standing supporter of the Society. We were also pleased to have three Deans of Science from universities in Sydney present. In her Occasional Address Her Excellency made reference to the antecedents of the Society and the work of one of her predecessors, Governor Lachlan Macquarie, in creating a climate in which Societies such as ours might germinate. We appreciate her support and that of the unbroken line of her predecessors.



The Governor, Marie Bashir, presents Fellowship to Professor Michelle Simmons.

The Governor, Marie Bashir, presents Fellowship to Emeritus Scientia Professor Eugenie Lumbers.



The Governor, Marie Bashir, congratulates Dr Ken Campbell on his award of the Clarke Medal.



The Governor, Marie Bashir, presents Assoc. Prof. Angela Moles with the Edgeworth David Medal.



The Governor, Marie Bashir, presents Prof. Rick Shine with the Walter Burfitt Prize.



The Governor, Marie Bashir, presents Dr Julian King with the joint AIP/Royal Society of NSW Studentship Award.



The Governor, Marie Bashir, with Society President John Hardie after he presented her with a token of the Society's appreciation.



Vice President, Heinrich Hora, gives the vote of thanks.