

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, they concluded that the task of a scientist is to analyse inconceivably complex data and make sense

of them but the public policy imperatives are driven by a media outcomes and necessarily requires the debate to be simplistic. The more we know about the complexities of nature, of the human body, the weather and so on, the more complex the questions. Science has been enormously successful and exciting in bringing an understanding in a world that we know so little about.



The Dirac Lecture

Friday, 29 April 2011

Beauty and truth: their intersection in mathematics and science

Robert Lord May of Oxford AC FRSN



On 29 April 2011, Robert Lord May of Oxford, perhaps the greatest mathematician that Australia has produced, was invested as a Fellow of the Royal Society of NSW by the Society's Patron, the Governor of NSW. Earlier that day, Lord May presented the

Dirac Lecture at the University of New South Wales, jointly sponsored by the Society. The topic of Lord May's lecture was "Beauty and truth: their intersection in mathematics and science". He took us on 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.

