

# 2009 Convocation Medal for Physicist

The question 'What is the origin of mass?' has, for centuries, fascinated enquiring minds and scientists.

The discovery of the atomic nucleus, and of its constituents, in the first half of the 20th century, showed that 99.9 per cent of the mass – the substance – of ordinary matter resides in protons and neutrons. The deeper question, of where the mass of those particles, the basic building blocks of matter, came from, has only been solved more recently. Craig Roberts' research shows us that it is generated dynamically from energy that resides in the gluons which are exchanged between quarks. Einstein's famous formula,  $E=mc^2$ , rewritten as  $m=E/c^2$ , tells us that this energy manifests itself as mass. Therefore the origin of most of the mass in, for instance, our bodies, turns out to reside in the fundamental and strong forces that are at work in the atomic nucleus. He has elucidated the nature of the most important mass-generating mechanism for visible matter in the Universe.

## Karmel Endowment Fund to commemorate great scholar

Emeritus Professor Peter Karmel AC CBE, Flinders University's founding Vice-Chancellor and one of Australia's most influential educationists, died in Canberra on 30 December 2008 at the age of 87. His contributions to education and research, and his influence on generations of researchers, scholars and students were profound.

Professor Karmel moved into a position at the University of Adelaide in 1949 and was appointed the principal-designate of the Planning Committee to develop a new campus of the University of Adelaide at Bedford Park. His vision for a separate and innovative institution began with the planning of a new university that became the Flinders University of South Australia in 1966, during a period of rapid expansion in the Australian tertiary education sector. It was also a time for innovation and Professor Karmel, speaking at a public meeting, explained his ambitions for the new campus: "We want to experiment and experiment bravely".

True to his word, he devised for Flinders a non-traditional academic structure aimed at broadening student experiences and academic opportunities by establishing four schools: Humanities (embracing language and literature), Social Sciences, Physical Sciences and Biological Sciences.

Flinders was South Australia's second university and over the next few years, it demonstrated its distinctiveness by teaching several courses not previously seen in the state, including Sociology, Drama, Fine Arts, Spanish and Indonesian, as well as Oceanography and Meteorology.

Professor Karmel was instrumental in the planning of another radical yet enduring aspect of Flinders: co-location of the School of Medicine and the Flinders Medical Centre in the new hospital's buildings on the western edge of the campus.

Professor Keith Hancock, Flinders third Vice-Chancellor and one of its six original professors, said Karmel had set the character of the University.

"Flinders University's indebtedness to Peter Karmel is immense. He had a capacity, unique in my experience, to combine leadership with the nurturing and encouragement of the contributions of others. Peter's talents were just what were needed in the early formative years of the University. His successors, including me, inherited a going concern," Professor Hancock said.

Professor Karmel also continued to contribute to Flinders long after he had served his term as Vice-Chancellor, as Denise Martin, Faculty General Manager, Science and Engineering, remembers. She was appointed Executive Officer to the Review of Administration that was conducted by Professor Karmel in 1991. Ms Martin recalls it was a challenging exercise involving interviews of a then highly centralised administration. She remembers working with Professor Karmel as being a "fantastic opportunity and brilliant experience".

"His standout characteristic was his wisdom, and the depth of knowledge and experience which he brought to the review," she said. "To work with somebody of that calibre and intellect was a valuable experience."

It is in keeping with this sentiment that we draw upon the legacy left for us by Professor Karmel, and honour him by creating the Karmel Endowment Fund. The Fund has been developed to channel the support the University receives from friends, alumni and corporate partners to enhance and develop the distinctiveness of Flinders.

Funds will be directed at projects that inspire academics and students alike; make a difference in our community and contribute to the tertiary sector as a whole. Supporting the Karmel Endowment Fund will also ensure that worthy students become the recipients of scholarships, that the Library receives funds for new books, and that the Art Museum is able to maintain and add to its collection.

Dara Boucher

Flinders University  
**Experiment, and experiment bravely**  
was the challenge posed for Flinders by the University's  
founding Vice-Chancellor, Emeritus Professor Peter Karmel AC, CBE.

Over the past 43 years, Flinders has done so, inspiring several generations of scholars and graduates who have enjoyed the finest levels of teaching and research. You can help Flinders to continue to meet Peter Karmel's bold vision with an investment in the future. A contribution towards the intellectual capital and skills development required to successfully tackle the challenges of the 21st Century.

To ensure Flinders continues to be bold and inspiring in teaching and research, we have established the Karmel Endowment Fund - support from business, alumni and the broader community is welcome.

You can find out about the opportunities to support Flinders University by contacting:  
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Craig Roberts (*BSc '83, BSc Hons '84, PhD PhysSc '89*) is internationally renowned for his work in Hadron Physics, which sits at the interface of Nuclear and Particle Physics, and aims to understand the internal structure of protons and neutrons forming the atomic nucleus.

Recipient of the 2009 Convocation Medal, Flinders University's premier Alumni award, Dr Roberts is Leader of the Theory Group at the Argonne National Laboratory in the United States and is the youngest person to have held this position. Overseeing the Group and its budget of more than US\$3 million per annum, he has obtained funding of US\$17 million to support its research, and the Group is the USA's top-ranked Nuclear Theory Group. Dr Roberts also serves as a Member of the Board of Directors for the Joint Theory Institute, which is a US\$1 million per year, multidisciplinary, joint research effort between Argonne and the University of Chicago.

A Fellow of the American Physical Society, Dr Roberts has been recognized by the Alexander von Humboldt Foundation as an "outstanding young researcher", and is a Guest Professor in the Physics Department of Peking University.

Flinders University recognises Dr Roberts outstanding work by awarding him the 2009 Convocation Medal.

The introductory paragraph about Craig Roberts' work was written by 2008 Distinguished Alumni Award winner, Daniel Phillips (*BSc '92 PhD '96*)

## 2009 Distinguished Alumni Awards

### Michael Raupach

Since the beginning of his PhD studies at Flinders University, Michael Raupach (*PhD EarthSc '78*) has devoted his professional life to meticulous studies of the atmospheric environment. The potential he showed for scientific and professional prowess as a postgraduate student has been confirmed by more than 100 refereed articles in internationally reputed journals. His prolific membership of international scientific committees and reviews endorse his standing in the scientific community. Michael is a research scientist with CSIRO and Leader of the Continental Biogeochemical Cycles Team in the Division of Marine and Atmospheric Research. He is also a Tier 1 contributing author of the 2007 IPCC (Intergovernmental Panel on Climate Change) Working Group 1 report – the IPCC was awarded the 2007 Nobel Peace Prize.



### Shao Yaping

Shao Yaping (*PhD EarthSc '91*) is Professor at the Institute for Geophysics and Meteorology, University of Cologne, Germany, and holds Adjunct Chairs at Beijing Normal University and the Chinese Academy of Sciences. He has held a Humboldt Fellowship and the KC Wang Fellowship and National Science Award from the Chinese Academy of Sciences.

Professor Shao is an internationally acknowledged scientific leader in atmospheric science, physics and modelling of wind erosion, integrated computational environmental modelling systems with applications to air quality, water resources, land-surface processes and atmospheric predictions, and atmosphere and hydrosphere interactions, surface hydrology, in particular, modeling of soil moisture and dry land salinisation processes.



### Mark Shephard

Mark Shephard OAM (*MSc Med Cwk '82*), Director and Senior Research Fellow, Community Point of Care Service in the Flinders University Rural Clinical School, has made a real and substantial difference in the quality of life for the Aboriginal peoples of Australia. He is recognised nationally and internationally as a leader in his field.

He initiated, developed, and implemented four substantial programs that impact significantly and positively on the lives of Aboriginal people. Each project concerns early detection, prevention and management of chronic diseases and the application of point-of-care medical instruments in the Aboriginal community health sector.

His Quality Assurance for Aboriginal Medical Services (QAAMS) program, a world first, empowers Aboriginal Health Workers and their health services to provide timely, efficient and practical diabetes monitoring services underpinned by a sound quality assurance framework. This provides a powerful, culturally appropriate, effective platform to improve diabetes management in Aboriginal people.

