



Communications

Australian Academy of Science Fellows

Seventeen of Australia's leading scientists were honoured on 23 March 2011 by election to the Australian Academy of Science (see <http://www.science.org.au/news/media/24march11.html>). Those honoured included the following mathematical scientists.

Professor Joseph John Monaghan FAA 'distinguished for his work in the development of smoothed particle hydrodynamics with broad applications in astrophysical, geophysical and engineering problems.'

Professor Ian Richard Petersen FAA FIEAust FIEEE 'distinguished for his work on robust control theory with innovative advances enabling the synthesis of robust state feedback controllers using standard software tools'.



Ian Petersen is a Scientia Professor and Federation Fellow in the School of Engineering and Information Technology at the University of New South Wales (Australian Defence Force Academy). He received a Bachelor of Engineering degree in Electrical Engineering from the University of Melbourne in 1979 and a PhD in Electrical Engineering from the University of Rochester in 1984. From 1983 to 1985 he was a Postdoctoral Fellow at the Australian National University. In 1985 he joined the University of New South Wales at the Australian Defence Force Academy. From 2002 to 2003, he was Executive Director in Mathematics, Information and Communications for the Australian Research Council and in 2004 he was Acting Deputy Vice Chancellor (Research) for the University of New South Wales. He has served as an Associate Editor for the *IEEE Transactions on Automatic Control*, *Systems and Control Letters*, *Automatica* and *SIAM Journal on Control and Optimization*. Currently he is an Editor for *Automatica*. He is a Fellow of the IEEE. His main research interests are in robust control theory, quantum control theory and stochastic control theory.

Professor Mathai Varghese FAA FAustMS 'distinguished for his work in geometric analysis involving the topology of manifolds, including the Mathai-Quillen formalism in topological field theory'.

Mathai Varghese obtained his PhD from Massachusetts Institute of Technology (MIT) in 1986 under the supervision of the Fields medallist Professor Daniel Quillen, and was appointed a Dickson Instructor at the University of Chicago. In 1989, he moved to the University of Adelaide, where he has been a Professor since 2006

and is currently an Australian Professorial Fellow of the Australian Research Council, and Director of the Institute for Geometry and its Applications. In 2000 he was awarded the Australian Mathematical Society Medal, in 2000–2001 he was awarded a Clay Research Fellowship and position of Visiting Scientist for a year at MIT, and in 2006 he was appointed a Senior Research Fellow for a semester at Erwin Schrödinger Institute in Vienna. From 2006 to 2009 he was Vice-President (in charge of annual conferences) of the Australian Mathematical Society and has also been a member of several national committees. Much of his research work is concerned with geometric analysis involving the topology of manifolds, and mathematical problems that originate from physics, such as topological field theories, the fractional quantum Hall effect and string theory.



Professor Aibing Yu FAA ‘distinguished for his work in particle science and technology, including methods to simulate and model the motion of individual particles within large populations in flowing systems’.

Aibing Yu is a Federation Fellow and Scientia Professor in the School of Materials Science and Engineering at the University of New South Wales (UNSW). He obtained a BEng in 1982 and a MEng in 1985 from Northeastern University, China, a PhD in 1990 from the University of Wollongong and a DSc in 2007 from the University of New South Wales. He is a world-leading scientist in particle and powder technology and process engineering, and is recognised as an authority in particle packing, particulate and multiphase processing, and simulation and modelling. He has authored more than 550 publications in these areas and is currently on the editorial board of more than 10 journals. He developed and directs a world class research facility, Simulation and Modelling of Particulate Systems (SIMPAS), at UNSW. Professor Yu is the recipient of various prestigious fellowships, including a CSIRO Postdoctoral Fellowship (1990–1991), an ARC Queen Elizabeth II Fellowship (1993–1997), an Australian Professorial Fellowship (2005–2009), a Federation Fellowship (2008–2012), and the Royal Academy of Engineering’s Distinguished Visiting Fellowship. He has also received the Josef Kapitan Award from the Iron and Steel Society, the Ian Wark Medal and Lecture from the Australian Academy of Science, and the Exxon Mobile Award from the Australian and New Zealand Federation of Chemical Engineers, and was the NSW Scientist of Year 2010 in the category of Engineering, Mathematics and Computer Science. He was elected as a Fellow of the Australian Academy of Technological Sciences and Engineering in 2004.

