

Forum Program



# Maths for the future: Keep Australia competitive

7–8 February 2012  
University House, ANU, Canberra



A national forum proposing strategies to secure mathematical and statistical skills for Australia.

Key players will talk about policy initiatives to improve standards, reverse teacher shortages and increase mathematics enrolments. The forum will outline action and endorse a coherent plan to ensure supply meets demand.

## Day 1 Program

Tuesday 7 February 2012	
TIME	SESSION
12:00 - 13:00	<b>Celia Hoyles</b> (former Mathematics Advisor to UK government)
13:00 - 14:00	<b>Lunch</b>
	<b>Overview</b> Ron Sandland (AMSI) Ian Chubb (Chief Scientist for Australia)
	<b>The future of the mathematical pipeline</b> Glenn Wightwick (IBM)
15:25 - 15:50	<b>Afternoon tea</b>
	Rob Vertessy (Bureau of Meteorology) Mike Manton (Academy of Technological Sciences and Engineering) Kim Beswick (AAMT) Christopher Pyne
18:30	<b>Pre-Dinner Drinks</b>
19:00	<b>Conference Dinner</b> Nobel Prize winner Professor Brian Schmidt will be guest speaker

## Day 2 Program

Wednesday 8 February 2012	
TIME	SESSION
9:15	<b>The importance of maths for the future</b> Paul Van Bergen (KPMG) Chris Evans
10:25 - 10:50	<b>Morning tea</b>
	Doug Hilton (WEHI) Len Sciacca (DSTO) Louise Ryan (CSIRO) Sophie Mirabella
13:00 - 14:00	<b>Lunch</b>
	<b>Future Policy</b> Steve Davies (APRA) Attila Brungs (Deputy Vice Chancellor (Research), University of Technology Sydney) John Rice (Australian Council of Deans of Science)
15:15 - 15:40	<b>Afternoon tea</b>
	<b>Taking Action</b>
15:40 - 17:00	<b>Round table</b>

# Day 1 Speakers

## Professor Celia Hoyles



Professor Celia Hoyles has been Professor of Mathematics Education at the Institute of Education, University of London since 1984, following teaching in London secondary schools. She has directed over 30 research and consultancy projects concerned with mathematics at all levels and in a variety of contexts and published widely in articles and books. Her major research interests are: secondary students' conceptions of proof and strategies for teaching proof; the mathematical skills needed in modern workplaces; the design and implementation of computational environments for learning and sharing mathematics; and systemic change in the professional development of teachers of mathematics. Recent books include: *Mathematics Education and Technology-Rethinking the terrain* (2009, co-editor Springer), and *Improving Mathematics at Work: The need for Techno-mathematical Literacies* (2010, co-author Routledge)

Professor Hoyles was awarded an OBE in the New Year's Honours list 2004 for services to mathematics education and was chosen as the first recipient of the Hans Freudenthal medal, in recognition of her cumulative programme of research. In December 2004 she took up the position of the U.K. Government's Chief Adviser for Mathematics (75% of her time), a position she held until November 2007. She was awarded honorary doctorates by the Open University in 2006 and Loughborough University in 2008.

In June 2007, Celia was appointed as (part-time) Director of the National Centre for Excellence in the Teaching of Mathematics.

## Dr Ron Sandland, AMSI



Dr Ron Sandland graduated from the University of Sydney in 1969 and joined the (then) Division of Mathematical Statistics of CSIRO. He gained actuarial qualifications in 1974 and his PhD from the University of New South Wales in 1980. His research interests were in applying statistics to solve challenging real problems in areas as diverse as growth of organisms, analysis of mark-recapture experiments, ore-reserve estimation and quality improvement. He became chief of the division in 1988, later managing its merger with the Division of Information Technology into what became CSIRO Mathematical and Information Sciences. In 1999 he became Deputy Chief Executive of CSIRO and took responsibility for the Flagship Initiative. This involved six major cross-disciplinary research programs and was aimed at addressing problems of national priority. Dr Sandland served the Statistical Society of Australia in various capacities including a period as President from 1993 to 1995. He was made an Honorary Life Member of the Society in 1998 and won the CSIRO Medal for Lifetime Achievement in 2006. Dr Sandland chairs the Steering Committee of the Australian National Data Service (ANDS) and the Advisory Board of the Australian Centre of Excellence in Risk Analysis (ACERA). He is a member of the Council of the University of Technology Sydney and chairs its Commercial Activities Committee. He is a Fellow of the Australian Academy of Technological Sciences and Engineering, and was made a member of the Order of Australia in 2007.

## Professor Ian Chubb AC, Chief Scientist for Australia



Professor Ian Chubb was appointed to the position of Chief Scientist on 19 April 2011 and commenced the role on 23 May 2011.

Prior to his appointment as Chief Scientist, Professor Chubb was Vice-Chancellor of the Australian National University from January 2001 to February 2011 and before that he was Vice-Chancellor of Flinders University of South Australia for six years.

Professor Chubb studied at Oxford University where, during the period 1971-1977, he was a Wellcome Foundation Scholar, a Junior Research Fellow of St John's College, and a Royal Society Research Fellow. He spent 1969-1971 as a JF & C Heymans Research Fellow at the University of Ghent, Belgium.

Professor Chubb's research focused on the neurosciences and was supported by the National Health and Medical Research Council, the Australian Research Grants Scheme and by various Foundations. He has co-authored some 70 full papers and co-edited one book related to his research.

In 1999 Professor Chubb was made an Officer of the Order of Australia (AO) for "service to the development of higher education policy and its implementation at state, national and international levels, as an administrator in the tertiary education sector, and to research particularly in the field of neuroscience". In 2006 he was made a Companion (AC) in the order for "service to higher education, including research and development policy in the pursuit of advancing the national interest socially, economically, culturally and environmentally, and to the facilitation of a knowledge-based global economy". In 2000, Professor Chubb was awarded a Doctor of Science (Honoris Causa) from Flinders University. He was made the ACT's Australian of the Year in 2011 for his contribution to higher education. In October 2011 he was awarded a Doctor of Letters (Honoris Causa) from Charles Darwin University.

## Glenn Wightwick, Director of Research and Development, IBM



Glenn Wightwick is leading the establishment of a new R&D Lab focussed on a number of IBM smarter planet initiatives. During the previous 4.5 years he led the establishment and growth of the IBM Australia Development Laboratory which is engaged in the development and support of IBM software. He has led numerous systems and software development projects, and has undertaken international assignments in the USA and China. He is a member of the IBM Academy of Technology, is a senior member of the IEEE, and has served a three year term on the Australian Research Council College of Experts. In 2010, he was appointed an Honorary Professorial Fellow at the University of Melbourne. He has recently been appointed to the Australian government's Information Technology Industry Innovation Council.

## Dr Rob Vertessy, Acting Director, Bureau of Meteorology



Currently acting Director of Meteorology, Dr Rob Vertessy heads up the Bureau of Meteorology's Climate and Water Division. This includes responsibility for the National Climate Centre, the national flood forecasting and warning service, the water information function and laying the foundations for a National Plan for Environmental Information. Dr Vertessy was the architect of the Australian Government's new national water information strategy, embedded in the Water for the Future initiative. He is a former Chief Executive of the CRC for Catchment Hydrology and former Chief of CSIRO Land and Water. Dr Vertessy has a PhD in fluvial geomorphology and spent the first 20 years of his career as a CSIRO researcher, specialising in catchment hydrology.

## Dr Michael Manton, Academy of Technological Sciences and Engineering



Dr Manton was Chief of the Bureau of Meteorology Research Centre from 1984 until his retirement in 2006, and he now has a part-time position as Professor in the School of Mathematical Sciences at Monash University. His initial training was in mechanical engineering and his PhD is in oceanography from the University of British Columbia. For five years he lectured in Mathematics at Monash University in the early 1970s, and he was then a research scientist in CSIRO Division of Cloud Physics for ten years. His research has been in turbulence, sea waves, boundary layer flows, cloud physics, and climate. He is a member of the Board of the Australian Academy of Technological Sciences and Engineering (ATSE), and is chair of the ATSE International Strategy Group.

## Associate Professor Kim Beswick, President, Australian Association of Mathematics Teachers



Associate Professor Kim Beswick was a secondary school mathematics teacher for 13 years before joining the University of Tasmania in 2000. She has maintained strong links with the profession and is currently President of the Australian Association of Mathematics Teachers. She was co-editor of Australian Primary Mathematics Classroom 2008-2010 and regularly engages in consultancies and research projects involving the design and delivery of professional learning for primary and secondary teachers of mathematics across school sectors. She has published more than 60 peer reviewed book chapters, journal articles and conference papers. The provision of quality professional learning for all mathematics teachers, and particularly those in remote and regional locations or teaching 'out of area', are important among her research and professional interests.

## The Hon Chris Pyne MP, Shadow Minister for Education, Apprenticeships and Training



Christopher Pyne was elected to the House of Representatives for the seat of Sturt in 1993. He is currently the Shadow Minister for Education, Apprenticeships and Training. In his time in Parliament he has been Shadow Minister for Justice, Border Protection and Assisting Shadow Minister for Immigration and Citizenship, Minister for Ageing, Assistant Minister and Parliamentary Secretary for Health and Ageing as well as Parliamentary Secretary to the Minister for Family and Community Services and Chairman of the Electoral Matters and Communications Committees of the House of Representatives. Before entering Parliament, he practised as a solicitor and was a senior member of the Liberal Party, serving on both the Federal Executive (1990-91) and the South Australian State Executive (1988 -1992).

# Conference Dinner Speaker

## Professor Brian Schmidt



### "Science, Society and Progress"

Professor Brian Schmidt, 2011 Winner of the Nobel Prize in Physics, will discuss how society is integrally linked to science and technology. This integration is not just through a few elite scientists, but through innovators, artists, policy makers, and the general population. Australia is experiencing a period of unprecedented wealth, and has the opportunity to help secure its long term future through investing in education, science, and innovation, to help create one of the world's most educated, and consequently, most productive, societies.

### Biography

Professor Brian Schmidt is a Laureate Fellow at The Australian National University's Mount Stromlo Observatory. He was raised in Montana and Alaska, USA, and received undergraduate degrees in Physics and Astronomy from the University of Arizona in 1989. Under the supervision of Robert Kirshner, he completed his Astronomy Master's degree (1992) and PhD (1993) from Harvard University. In 1994 he and Nick Suntzeff formed the High-Z Supernova Search team, a group of 20 astronomers on 5 continents who used distant exploding stars to trace the expansion of the Universe back in time. This group's discovery of an accelerating Universe was named Science Magazine's Breakthrough of the Year for 1998. Professor Schmidt joined the staff of the Australian National University in 1995, and was awarded the Australian Government's inaugural Malcolm McIntosh award for achievement in the Physical Sciences in 2000, The Australian Academy of Sciences Pawsey Medal in 2001, the Astronomical Society of India's Vainu Bappu Medal in 2002, and an Australian Research Council Federation Fellowship in 2005. In 2006, Professor Schmidt was jointly awarded the US\$1M Shaw Prize for Astronomy, and shared the US\$0.5M 2007 Gruber Prize for Cosmology with his High-Z Supernova Search Team colleagues. In 2008 he was elected a Fellow of the Australian Academy of Sciences, a Fellow of the United States National Academy, and Foreign Member of the Spanish Royal Academy of Sciences. His work on the accelerating universe was awarded the 2011 Nobel Prize in Physics, jointly with Adam Riess and Saul Perlmutter. Brian is continuing his work using exploding stars to study the Universe, and is leading Mt Stromlo's effort to build the SkyMapper telescope, a new facility that will provide a comprehensive digital map of the southern sky from ultraviolet through near infrared wavelengths.

## Day 2 Speakers

### Paul van Bergen (KPMG - Partner, R&D Incentives, Sydney)



Paul van Bergen is practice leader of KPMG's specialist R&D incentives team in Sydney and has over 20 years experience in R&D incentives claims.

He has been responsible for the successful industry submission in direct consultation with treasury and AusIndustry policy branch that resulted in practical solutions to enable of software related claims under the new R&D Tax Incentive.

He services a number of clients in the financial services, digital media and communications sectors ranging from start-ups to some of Australia's largest and most successful companies.

He is a regular keynote presenter on R&D for professional associations and industry bodies including the Institute of Chartered Accountants, Taxation Institute of Australia, Plastics and Chemicals Industry Association, Australian Industry Group, Consult Australia as well as commercial seminars.

### Senator the Hon Chris Evans (Minister for Tertiary Education, Skills, Science and Research)



Senator Chris Evans was elected to Federal Parliament in 1993. From December 2007 he served as Minister for Immigration and Citizenship in the Rudd Government and following the 2010 election, he was appointed Minister for Tertiary Education, Skills, Jobs and Workplace Relations in the Gillard Labor Government.

In December 2011 he was sworn in as the Minister for Tertiary Education, Skills, Science and Research. He is also the Leader of the Government in the Senate.

By bringing together training, education, innovation and research, the Government is putting a major emphasis on ensuring Australia has a workforce with the skills and research capabilities to allow industry to grow and improve productivity.

Prior to Labor achieving office, Senator Evans held a variety of shadow portfolios including Family and Community Services, Aged Care, Defence, Social Security, National Development and Resources and Energy. Prior to entering Federal Parliament, Senator Evans was the State Secretary of the Labor Party's WA Branch and before that was Secretary of the Fire Fighters Union in WA.

## Professor Doug Hilton, Director, Walter and Eliza Hall Institute of Medical Research



Professor Douglas Hilton is the 6th Director of the Walter and Eliza Hall Institute, Head of its division of Molecular Medicine and head of the Department of Medical Biology in the Faculty of Medicine, Dentistry and Health Sciences at the University of Melbourne. Professor Hilton's research aims to understand which of the 25,000 genes are important in the production and function of blood cells and how this information can be used to better prevent, diagnose and treat blood cell diseases such as leukaemia, arthritis and asthma. He has been awarded numerous prizes for his research into how blood cells communicate and has led major collaborations with industry to translate his discoveries from the bench to the bedside.

Professor Hilton was educated at Warrandyte primary school and East Doncaster high school in the eastern suburbs of Melbourne, prior to completing a Bachelor of Science degree at Monash University. In 1986, he moved to the Walter and Eliza Hall Institute of Medical Research and The University of Melbourne as a Bachelor of Science Honours student and stayed to complete his PhD. He spent two years as a postdoctoral fellow at The Whitehead Institute, Massachusetts Institute of Technology in Boston, before returning to WEHI as a laboratory head. In 2005 he was invited to create and lead the Division of Molecular Medicine, which aims to use systems biology to understand the blood cell system. In 2009, he was appointed as director of Walter and Eliza Hall Institute.

## Dr Len Sciacca, Chief Operating Officer, DSTO



Dr Len Sciacca has over 27 years research and industrial experience in embedded real-time control and computing, sensor design, sensor networks and senior management roles in Government and industry sectors. In the 80's and 90's he worked for CSIRO at the Parkes Radio-Telescope; the Universities of Newcastle and Melbourne and was Technical Director of TUNRA.

Dr Sciacca has worked in the defence industry as the Engineering and R&D Manager of Tenix Electronic Systems. He held the position of Chief of the Electronic Warfare and Radar Division of the Defence Science and Technology Organisation leading a research Division of over 200 scientists, engineers and technicians with specialist expertise in RF systems, Electro-Optics, Radar and signal processing. In this role he led substantial multi-million dollar international collaborations, industry alliances and the commercialisation of innovative technologies. He established the Centre of Expertise in Networked Decision and Sensor Systems with the University of Melbourne in sensor networks and research in adaptive sensor design. He is currently the Chief Operating Officer of DSTO and recently he took up the role of Director of the Defence Science Institute at the University of Melbourne leading collaborative programs between universities, industries and research agencies in Australia and overseas.

He is a Fellow of the Academy of Technological Sciences and Engineering, an honorary Professor at the University of Melbourne and was previously Chair of the Australian Research Council College of Experts for Mathematics, Information and Communication Sciences.

Dr Len Sciacca obtained his BE from QUT and his ME and PhD in Electrical Engineering from the University of Newcastle, NSW.

## Dr Louise Ryan, Chief, CSIRO Mathematics, Informatics and Statistics



Dr Louise Ryan is well known for her contributions to statistical methods for cancer and environmental health research. She is currently leading CSIRO's Mathematics, Informatics and Statistics division, a group of 150 people working in research areas as diverse as financial risk, climate change, services and cell biology. This research is allowing CSIRO to better address national challenges.

Dr Ryan attained a Bachelor of Arts in statistics and mathematics from Macquarie University Sydney, and a Doctorate of Philosophy in statistics from Harvard University, USA. She grew up in Australia but has spent almost thirty years in the USA, where she most recently held the post of Henry Pickering Walcott Professor and Chair of the Department of Biostatistics at Harvard University. She joined CSIRO in 2009.

Over her career she has been recognised with a number of professional awards and achievements including: Fellow of the American Statistical Association; the Spiegelman Award, conferred by the American Public Health Association; and the Distinguished Achievement Award of the Environmetrics Section of the American Statistical Association. Dr Ryan has also served as editor or associate editor for a number of statistical journals and President of the Eastern North American Region of International Biometric Society.

Other significant contributions Dr Ryan has made as a mentor to women and minority students have led to several awards which include the annual Mentors Award from Harvard School of Public Health and a Role Models award from Minority, Inc. Dr Ryan has been a passionate advocate for diversity in higher education and was the founding director of a program for the training of minority students at Harvard.

## Sophie Mirabella MP, Shadow Minister for Innovation, Industry and Science



Sophie Mirabella (nee Panopoulos) was first elected to the House of Representatives in 2001 as the Member for Indi, a rural electorate in the north-east of the State of Victoria.

In December 2009, Mrs Mirabella was appointed to Shadow Cabinet and Shadow Minister for Innovation, Industry and Science. She had already served as Shadow Minister for Early Childhood Education, Childcare, Women and Youth.

Mrs Mirabella is currently a member of the Standing Committees on Foreign Affairs, Defence and Trade. In Government, she chaired the Joint Standing Committee on Electoral Matters. She has been a member of the following committees: Legal and Constitutional Affairs; National Capital and External Territories; Family, Community, Housing and Youth; Agriculture, Fisheries and Forestry; and Employment and Workplace Relations.

She was also an elected delegate to the Australian Constitutional Convention in February 1998.

She holds Bachelor degrees in Law and Commerce and a Masters degree in Law from the University of Melbourne, and worked as a barrister before being elected to the Federal Parliament.

## Dr Steve Davies, General Manager, Statistics, Australian Prudential Regulatory Authority



Contributing to its role as the prudential regulator in Australia, APRA acts as a national statistical agency for the Australian financial sector. APRA provides financial statistics to contribute to a more stable, competitive and efficient financial system.

Since joining APRA in 1999, Dr Davies has worked with the financial sector to modernise and improve APRA's regulatory reporting framework and data collection systems. He was also responsible for the development of APRA's statistics publications as well as the centralisation of data collection at APRA on behalf of the Reserve Bank of Australia and the Australian Bureau of Statistics.

Prior to joining APRA, Dr Davies worked with the CSIRO (Commonwealth Scientific and Industrial Research Organisation Australia) for ten years as an applied statistical scientist.

Dr Davies holds an Honours degree in Mathematics and Computation from Oxford University and a Ph.D. in Statistical Science from the Australian National University.

## Professor Attila Brungs, Deputy Vice-Chancellor, University of Technology, Sydney



Professor Attila Brungs is the Deputy Vice-Chancellor and Vice-President (Research) at the University of Technology, Sydney. Prior to that he was General Manager, Science Investment, Strategy and Performance at CSIRO where he was responsible for research direction and resource allocation, performance monitoring of research programs, and the development and implementation of organisational strategy. Professor Brungs is a Rhodes Scholar, with a Doctorate in Inorganic Chemistry from Oxford University, and recipient of the University Medal in Industrial Chemistry from UNSW.

## Professor John Rice, President Australian Council of Deans of Science

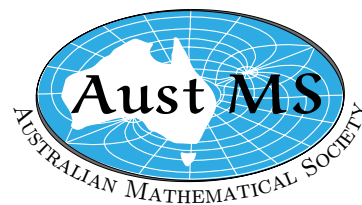


Professor John Rice is Executive Director of the Australian Council of Deans of Science (ACDS) and an honorary professor of mathematics at Sydney University. He was Dean of the Faculty of Science and Engineering at Flinders University from 1993-2000, Director of the Flinders Institute for Research in Science and Technology 2000-2004, and Dean of the Faculty of Science at UTS from 2004-2008. He was the inaugural president of the ACDS from 1995-1998 and served again as president from 2006-2008. He initiated the Australian Science and Mathematics School, a year 10-12 public high school, which opened on Flinders University Campus in 2003, and chaired its development and governing bodies between 2000-2004. As Executive Director of the ACDS from 2008 he established its annual teaching and learning conferences and plays an active role in initiating and promoting national projects and policy initiatives in tertiary science and mathematics teaching and learning.

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