



The Royal Society of New South Wales



The Australian Academy of the Humanities

Royal Society of NSW and Four Academies Forum

Government House, Sydney, Thursday 29th November, 2018

TOWARDS A PROSPEROUS YET SUSTAINABLE AUSTRALIA – WHAT NOW FOR THE LUCKY COUNTRY?

Programme

Start	Finish	Detail	Speaker	Notes	
08:30	08:50	Registration			
08:50	08:55	Guests are seated			
08:55	09:00	Governor is announced			
09:00	09:05	Welcome	Prof Ian Sloan AO FAA FRSN, President, Royal Society of NSW	Includes Acknowledgement of Country	
09:05	09:15	Official opening	His Excellency General The Hon David Hurley AC DSC (Ret'd), Governor of NSW and Vice Regal Patron of the Society		
09:15	09:15		Dr Brian Spies FTSE FRSN will introduce speakers and lead questions		
09:15	09:35	Opening Speaker	Hugh Durrant-Whyte	Sustainability – Setting the Scene (20 min no questions)	
09:35	10:00	Speaker	Hugh Mackay	Why Social Cohesion Is our Greatest Challenge	
10:00	10:25	Speaker	Samantha (Sam) Mostyn	Australia's Progress against the UN's Sustainable Development Goals	
10:25	10:50	Speaker	Graham Turner	Is a Sustainable Future Possible?	
10:50	11:10	Morning tea	Tea and coffee served on veranda. (20 mins)		

11:10	11:30	Speaker	Brian Czech by video	Steady State Economics, the Trophic Theory of Money, and GDP as an Indicator of Environmental Impact (20 min no questions)
11:30	11:55	Speaker	Ashley Brinson	The Circular Economy: International Case Studies and Best Practices
11:55	12:20	Speaker	Jacky Hodges	Australia's Environmental-Economic Accounts

12:20	13:10	Lunch	Light lunch (sandwiches, wraps served on veranda). (50 min)	
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13:10	13:35	Speaker	Toby Walsh	Australia's Artificially Intelligent Future
13:35	14:00	Speaker	Mary-Anne Williams	The AI Race: Will Australia Lead or Lose?
14:00	14:25	Speaker	James Morley	Australia, the Safe

14:25	14:45	Afternoon tea	Tea and coffee served on veranda. (20 min)	
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14:45	15:10	Speaker	Edward Holmes	The Future of Biosecurity in Australia
15:10	15:35	Speaker	John Quiggin	Getting Climate Policy Back on Track
15:35	15:50	Rapporteur	Ann Williamson	Summing up – What Future the Lucky Country?
15:50	16:00	Close	Prof Ian Sloan AO FAA FRSN, President, Royal Society of NSW	Thanks and Close

16:00	17:30		Reception	
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Abstracts and Biographies

Hugh Durrant-Whyte HonFIEAus FIEEE FTSE FAA FEng FRS FRSN

Sustainability – Setting the Scene

Biography

Hugh Durrant-Whyte is NSW Chief Scientist and Engineer. From 2017-18 he was Chief Scientific Advisor to the UK Ministry of Defence, from 2010-2014, he was CEO of National ICT Australia (NICTA), and from 1995-2010 Director of the ARC Centre of Excellence for Autonomous Systems, an ARC Federation Fellow, and the founding Director of the Australian Centre for Field Robotics (ACFR) at the University of Sydney. Hugh is a world-leading authority on machine learning and robotics, and its application. He has published over 300 research papers, graduated over 70 PhD students, and has won numerous awards and prizes for his work, including being named 2010 NSW Scientist of the Year. In his career he has worked with many major companies, has co-founded three successful start-up companies, and has won many awards including being named 2008 Engineers Australia NSW Engineer of the Year. He is particularly well known for his work with Patrick in delivering the automated container terminals in Brisbane and Port Botany, and for his work with Rio Tinto in pioneering the delivering the automated “Mine of the Future”. He is an honorary Fellow of Engineers Australia (HonFIEAus), a Fellow of the IEEE (FIEEE), Fellow of the Australian Academy of Technological Sciences and Engineering (FTSE), Fellow of the Australian Academy of Science (FAA), Fellow of the Royal Academy of Engineering (FEng), and a Fellow of the Royal Society of London (FRS).



Hugh Mackay AO FAPS FRNSW

Why Social Cohesion is our Greatest Challenge

The two most significant facts about contemporary Australia are causally connected: our epidemic of anxiety and depression, and our increasing social fragmentation. Fragmentation increases the risk of social isolation, loneliness and anxiety; anxiety, in turn, inhibits our openness to change and our vulnerability to fear-based propaganda. We need to rebuild social at the micro level and trust in our institutions at the macro level by adopting a more compassionate, more respectful approach to each other. (Compassion is, after all, the only rational response to an understanding of what it means to be human.)

Biography

Hugh Mackay is a social researcher and bestselling author of 19 books, including *The Good Life*, *The Art of Belonging*, *Beyond Belief* and his latest, *Australia Reimagined*, published in 2018. He has had a 60-year career in social research, and was also a weekly newspaper columnist for over 25 years. He is currently a patron of the Asylum Seekers Centre and an honorary professor of social science in the University of Wollongong. Among many other appointments, he has been deputy chairman of the Australia Council for the Arts, chairman of trustees of Sydney Grammar School, and the inaugural chairman of the ACT government’s Community Inclusion Board. In recognition of his pioneering work in social research, Hugh has been elected a Fellow of the Australian Psychological Society and awarded honorary doctorates by Charles Sturt, Macquarie, UNSW, Western Sydney and Wollongong universities. He was appointed an Officer of the Order of Australia in 2015.



Samantha (Sam) Mostyn

Australia's Progress against the UN's Sustainable Development Goals

The UN's Sustainable Development Goals are a blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice.

Australia's National Sustainability Council was established in October 2012 as an independent, expert body to provide advice on sustainability issues. The council's role was to deliver a public report against the sustainability indicators for Australia every two years. The Council was abolished after its 2013 report, but the work has continued with support from Monash University. This presentation will report on Australia's progress against the UN's Sustainable Development Goals.



Biography

Sam Mostyn is a non-executive Director and Sustainability advisor with a broad range of roles encompassing business, arts, climate change, sport, indigenous affairs, gender and violence, think tanks, sustainability, aid & development, and mental health.

She is Chair of Citibank Australia, and sits on the boards of Virgin Australia, Transurban and Mirvac. She was the first woman appointed to the AFL Commission in 2005 where she served until 2017 after working on the development of AFLW, before joining the board of the Sydney Swans. Sam is Chair of Carriageworks, and previously served on the Australia Council for the Arts and the Sydney Theatre Company. She is a board member of the Centre for Policy Development, the Climate Council, Climateworks Australia, and the Foundation for Young Australians. She also chairs ANROWS, Australia's leading body for evidence and research on the reduction of violence against women and their children. Sam serves on the National Sustainability Council, the advisory board for the Monash University Sustainable Development Institute, and has for many years served on the Australian faculty of the Cambridge University Business & Sustainability Leadership Program.

Graham Turner

Is a Sustainable Future Possible?

Simulations of the real economy at both global and national scales have highlighted the unsustainable path we're on (modelled respectively in *The Limits to Growth* and the *Australian Stocks and Flows Framework*). These models also allow us to examine what it takes physically to change to a sustainable future. Not only are the actions required immense, but research by others points to the critical role of social resistance to change.

Biography

Dr Graham Turner's research involves whole-of-system analysis on the long-term physical sustainability of the environment and economy. Graham has developed and applied the *Australian Stocks and Flows Framework* to create 'what if' scenarios exploring sustainability. At the global level, he examined the *Limits to Growth*, demonstrating that the infamous modelling of the 1970's is, somewhat alarmingly, on track. Graham now runs Earth Accounts Consulting, and is an organic market gardener. Formerly, Graham was a principal research fellow with the Melbourne Sustainable Society Institute at the University of Melbourne. His sustainability research began when joining CSIRO in 2000.



Previously, he was a policy analyst in the Defence Department; researched ultra-insulating vacuum glazings at the University of Sydney; and began his applied physics career working on industrial plasma physics at IBM's T.J. Watson laboratory in NY, USA, and at the University of Sydney.

Brian Czech

Steady State Economics, The Trophic Theory of Money, and GDP as an Indicator of Environmental Impact Simulations

The evidence is all around us — the global human economy has grown too large. Continued economic growth (especially in high-consuming nations) is at best irresponsible, and at worst risks ecological collapse and resource deprivation for future generations. The logical way forward for nations of the world is to take a different path to achieve sustainable, healthy, and equitable lifestyles for citizens. The alternative to continued economic growth is a non-growing or steady state economy. Modern societies have not undertaken efforts to establish steady state economies – the goal has consistently been growth, especially since the dawn of the industrial revolution.



Biography

Brian Czech has a Ph.D. in renewable natural resources studies from the University of Arizona with a minor in political science. The founding President of CASSE, Brian is also a Visiting Professor at Virginia Tech, where he teaches ecological economics in the National Capitol Region. A prolific author in a variety of venues, his scientific articles have appeared in dozens of peer-reviewed journals, dealing primarily with ecological and economic sustainability issues. His books include *Supply Shock: Economic Growth at the Crossroads*, released in May 2013; *Shoveling Fuel for a Runaway Train*, which calls for an end to uneconomic growth; and *The Endangered Species Act: History, Conservation Biology, and Public Policy*.

Brian is a regular contributor to *The Huffington Post* and *The Daly News*, a blog devoted to advancing the steady state economy as a policy goal with widespread public support. Brian is also an Interdisciplinary Biologist in the national office of the U.S. Fish and Wildlife Service, where he received a 2010 Star Award for outstanding performance. He has played a leading role in engaging the environmental sciences and natural resources professions in ecological economics and macroeconomic policy dialog.

Ashley Brinson FIEAust FIChemE CPEng NER PE(US-KY) Eurlng

The Circular Economy: International Case Studies and Best Practices

Globally, a number of governments are implementing or considering the implementation of policies that encourage or require the recycling and re-use of materials in what is called, “The Circular Economy”. A few international case studies are examined to consider best practices and to learn what may be possible by reconfiguring patterns of consumer use, recycling and share economy models to minimise primary raw material use and minimise ultimate landfill waste.



Biography

Mr Ashley Brinson is the Executive Director of the Warren Centre for Advanced Engineering. Ashley has broad experience in R&D, capital project management, international business expansion, technology transfer, professional performance and public policy. An inventor on five PCT patent sets, he has extensive experience in the silicon industry, having designed, constructed and managed major facilities in the US, UK and China.

Ashley holds a BChE from Georgia Tech, an MBA from Rutgers and a Juris Doctor from Sydney University Law School. Ashley is a Fellow of Engineers Australia, a Fellow of IChemE and a lawyer of the Supreme Court of NSW.

Jacky Hodges

Australia's Environmental-Economic Accounts

For decades, the primary measure of economic activity, gross domestic product (GDP), has measured “progress” without accounting for the cost borne by the environment, nor the substantial benefits society receives from it. In 2012, the UN Statistical Commission adopted the System of Environmental-Economic Accounting (SEEA) as the international statistical standard for the integration of environmental data within the SNA, including new standards for the measurement of GDP adjusted for the depletion of natural resources such as timber, fish, water and mineral resources. Australia has been at the leading edge of these developments and the Australian Bureau of Statistics (ABS) has a small but well-established program for environmental accounting, producing accounts for flows of water and energy on an annual basis, and annual measures of the stocks and values of land and various natural resources. This presentation will discuss the ABS program of environmental-economic accounts, which are all brought together in the annual report, *Australian Environmental-Economic Accounts*.



Biography

Jacky Hodges is a senior leader with extensive program delivery experience and has worked in strategic advisory roles to the Commonwealth, State, Local and Commercial and Not for Profit sectors. Jacky is a sound strategic thinker who excels in connecting and collaborating, both domestically and internationally. She currently leads the Industry Statistics Division of the Australian Bureau of Statistics. The Division is responsible for developing, compiling, analysing and disseminating statistical information across a range of sectors, including Agriculture, Environment, Building and Construction, Transport, Tourism, International Trade, Innovation and Technology. The Division also produces Main Economic Indicators including Private New Capital Expenditure, Retail Trade, Business Indicators and Building Approvals. The Division is focussed on working with its partners to provide a strong information base for policy development and evaluation.

Toby Walsh FAA

Australia's Artificially Intelligent Future

Artificial Intelligence (AI) offers enormous opportunities to improve the economic, societal and environmental wellbeing of Australia. In this talk, I'll discuss both the opportunities and the challenges. How do we maximize the benefits and minimize the risks?

Biography

Toby Walsh is Scientia Professor of Artificial Intelligence at the University of New South Wales and Data61. He was named by *The Australian* newspaper as a "rock star" of Australia's digital revolution.



Toby chairs the ACOLA expert working group preparing a report for government on the opportunities for the deployment of AI in Australia and New Zealand. He is a Fellow of the Australian Academy of Science. He appears regularly on TV and radio, and has authored two books on AI for a general audience, the most recent entitled *2062: The World that AI Made*.

Mary-Anne Williams FTSE

The AI Race: Will Australia Lead or Lose?

Artificial intelligence (AI) that can enhance, improve and scale human expertise is profoundly changing our lives. It is transforming how we perceive and interact with the physical and digital worlds shaping our experiences, beliefs and choices. AI is poised to disrupt industries, economies and geopolitics.

Australia is surprisingly well positioned to seize the new opportunities for innovation and prosperity that AI technologies can bring. Our major trading partners have already declared their ambitions to be AI leaders making substantial investments. Now is the time for Australia to take bold strategic action, or risk being left further behind.

This talk will explore the capabilities and impact of state-of-the-art AI and Robotics. It will identify the major challenges and significant risks confronting Australia as it struggles to seize a sustainable leadership position in an inevitable and rapidly approaching AI future.

Biography

Mary-Anne Williams is a Distinguished Professor and Director of The Magic Lab in the Centre of AI at UTS. She is listed on Robohub's top 25 women in robotics. She has a PhD in Artificial Intelligence and a Master of Laws. Mary-Anne is a Fellow at Stanford University, the Australian Academy of Technological Sciences and Engineering (ATSE), and the Australian Computer Society (ACS). She is a leading authority on AI and Robotics with transdisciplinary expertise in Autonomous Decision Making, Machine Learning, Cybersecurity, AI and Law, Disruptive Innovation and Entrepreneurship.

Mary-Anne leads academic engagement on the Innovation Reference Group for the South West Sydney Local Health District. She has served on the ARC College of Experts, and chaired the ARC Excellence in Research for Australia Committee that undertook a national evaluation of research in Mathematics, Information and Computing Sciences in 2012. She established and continues to lead Australia's leading Social Robotics research team at UTS, which includes Steve Wozniak, Peter Gardenfors and Henri Prade. This team works in partnership with CBA and Softbank Social Robotics.



James Morley

Australia, the Safe

In these turbulent times, Australia stands out as a safe option for foreign investors and migrants. The resulting capital and labour inflows are likely to be a boon for the economy. But they come with risks of fickle financial markets and political backlash over increased migration, no matter how skilled the migrants. I will discuss the economic basis, consequences, and risks involved in being a safe harbour for the world.

Biography

James Morley is Professor of Macroeconomics at the University of Sydney since 2017. His research focuses on the empirical analysis of business cycles, stabilization policy, and sources of persistent changes in macroeconomic and financial conditions. He is an Academic Fellow of the Reserve Bank of New Zealand and has been a visiting scholar at various policy institutions worldwide, including the Bank of Canada, Bank Negara Malaysia, and the Bank for International Settlements. He is a former President of the Society for Nonlinear Dynamics and Econometrics, and is currently Co-Editor of *The Economic Record*.



Edward Holmes FAA FRS

The Future of Biosecurity in Australia

The talk concerns biosecurity and threats that Australia faces in an ever more connected world, involving a discussion of the history and impact of infectious disease in Australia, the modern tools we have developed to assess biosecurity, and the sort of biosecurity challenges that Australia might face in the coming decades and what we ought to be doing about it.

Biography

Eddie Holmes is an ARC Australian Laureate Fellow and Professor at the University of Sydney. Prior to that it was an NHMRC Australia Fellow at the University of Sydney, which he joined in 2012. Eddie received his undergraduate degree from the University of London (1986) and his Ph.D. from the University of Cambridge (1990). Between 1993-2004 he held various positions at the University of Oxford, including University Lecturer in Evolutionary Biology and Fellow of New College. He was elected a Fellow of the Australian Academy of Science (FAA) in 2015 and of the Royal Society (FRS) in 2017. In 2017 he won the NSW Premier's Prize for Science and Engineering (Biological Sciences).



John Quiggin FASSA

Getting Climate Policy Back on Track

At this point, the only hope of reducing Australia's greenhouse gas emissions is a change of government. But after the chaos and inaction of the past six years, is it possible to achieve our minimal Paris commitments, let alone the larger reductions in emissions that are needed. Both a carbon price and direct intervention are needed.

Biography

John Quiggin is a Vice-Chancellor's Senior Fellow in Economics at the University of Queensland. He is prominent both as a research economist and as a commentator on Australian and international economic policy. He is a Fellow of the Econometric Society, the Academy of the Social Sciences in Australia and many other learned societies and institutions.



Ann Williamson FRSN

Summing up – What Future the Lucky Country?

Biography

Ann Williamson is Professor of Aviation Safety at UNSW. Professor Williamson's research is in the area of human factors, primarily focussing on two related areas; the effects of fatigue and the role of human error in injury and safety. She has a significant track record of research in safety, especially in the areas of workplace and road safety.

After working as a Research Scientist for the NSW Government in the Department of Industrial Relations, Division of Occupational Health, she moved to the National Institute of Occupational Health and Safety, where she was Principal Research Scientist and Head of the Human Factors and Ergonomics Unit. During her time at the Institute, Ann developed a reputation in a number of areas relating to injury, in particular for her work on fatigue and working hours, especially involving long distance road transport; the role of behaviour in the causes of injury; and the neurobehavioural effects of exposure to workplace hazards.

This work has continued following her move to the University of New South Wales, where Ann established the NSW Injury Risk Management Research Centre and was Deputy Director. Ann has published extensively in the scientific literature and also been an invited speaker at a wide range of national and international conferences and an invited member of a number of government committees on road and workplace safety. Ann's contributions to the area of injury prevention also include membership of the board of the *Journal of Safety Research* and regular reviewing for a number of scientific journals and granting bodies.

