ROYAL SOCIETY
NEW SOUTH WALES

1330th ORDINARY GENERAL MEETING
Wednesday 2 April 2025 at 6:30pm

Michael Crouch Room, Mitchell Building, STATE LIBRARY OF NSW
(enter from the Shakespeare Place entrance)

The 1330th Ordinary General Meeting of the Royal Society of NSW will take place at **6:30 pm on Wednesday 2 April 2025** in the **Michael Crouch Room, Mitchell Building, State Library of NSW**, followed by an open lecture.

Note that the Society's annual general meeting will take place in the same room at 6:00pm. Refreshments will be available from 5:30 pm. Registration for both the AGM and OGM will commence at that time.

AGENDA

1. WELCOME AND APOLOGIES
President, Dr Susan Pond AM FRSN.

2. MINUTES
Minutes of the 1329th Ordinary General Meeting will be reviewed.

3. CONFIRMATION OF NAMES OF CANDIDATES FOR FELLOWSHIP AND MEMBERSHIP
At its meeting 26 February 2025, the Council, upon recommendation of the Fellows and Members Assessment Committee, agreed to propose the following candidates for admission as Fellows and Members.

FELLOWSHIP

Professor Roger Chung
Laudation – Roger Chung has made notable contributions to the fields of neurobiology and neurochemistry.

Professor Helen Rizos
Laudation – Helen Rizos has made significant contribution to the biomedical sciences, notably in the field of cancer research.

Professor Buddhima Nalin Indraratna
Laudation – Buddhima Indraratna has made an international contribution to geotechnology.

Professor Lisa Wood
Laudation – Lisa Wood has made a substantial contribution to nutrition and respiratory medicine.

Brendon Hyde
Laudation – Victor Brendon Hyde has made a significant contribution to the field of civil engineering.

Dr Anna Maria Funder
Laudation – Anna Funder has made a significant contribution to Australian literature.

Professor Debbie Haski-Leventhal
Laudation – Debbie Haski-Leventhal has made a notable contribution to the field of management especially in the area of corporate responsibility.

Gary Ian Zamel
Laudation – Gary Ian Zamel has made a notable contribution to the commercialisation of science and technology.

Professor Michael Newton Barber
Laudation – Michael Barber has made a substantial contribution to statistical mechanics research and Australian higher education.

Professor Yihong Du
Laudation – Yihong Du has made a substantial contribution to the discipline of mathematics, notably in the area of nonlinear elliptic and parabolic partial differential equations.

Professor Olivier Piguet
Laudation – Olivier Piguet has made a substantial contribution to clinical neuropsychology, notably in the area of dementia.

Dr Abul Khair Rizvi
Laudation – Abul Khair Rizvi has made a significant contribution to Australia's population and immigration policy and practice.

Dr Michael William Taylor
Laudation – Michael Taylor has an international reputation in financial regulation and has also contributed to the history of ideas.

MEMBERSHIP
Dr Merrilyn Clancy
Kim Man Ip
Dr Marissa Betts
Dr Mahendra Gunathilaka Samarawickrama
Dr Julie-Ann Robson
Sophie Charlotte Mary Ray
Lea Kannar-Lichtenberger

4. PRESENTATION OF FELLOWSHIP AND MEMBERSHIP CERTIFICATES
The President will present certificates to new Fellows whose nominations were tabled at the previous OGM or who were unable to attend previously and have notified the Secretariat of their attendance.

5. REPORT FROM COUNCIL AND COMMITTEES OF COUNCIL
The President will update membership on the key activities underway for 2024.

6. OPEN LECTURE

"Engineering the Future"

Professor Hugh Durrant-Whyte
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NSW Chief Scientist and Engineer

Professor Durrant-Whyte has worked as an engineer in academia, industry and government for over forty years during which time he has witnessed and been an active participant in great change – driven primarily by the growing power of information and communication technologies. In the next forty years of engineering will deliver even more profound change for humanity through the intersection of four technology domains – Digital, Biology, Materials and Energy:

The digital and information age is still in its infancy. The positive potential of artificial intelligence (AI) and robotics to enable more productive lives, to make better decisions and to undertake tasks not yet possible, is just beginning. While mindful of the perils, Australia stands to benefit substantially from these developments – from increased and bespoke

manufacturing activity, through smarter defence, to managing fragile ecosystems. New physics, in quantum, photonics and organics, will also drive unprecedented advances in information technology hardware, from computing to sensing and communications.
The revolution in biology in the last two decades rivals that of the early information age. Biology is increasingly an engineering discipline as it becomes more concerned with design, computation and manufacturing. Engineering is already at the heart of new and developing biology industries from RNA to synthetic meats. Engineering thinking is also driving new directions in biology: the use of computational AI in protein structure prediction; understanding life as a complex web of protein nano-machines; and the use of tools from synthetic biology and gene editing to create new proteins and organisms. I believe that as biology becomes an engineering technology, its impact will surpass even that of the information age.

Materials science has changed beyond all recognition from forty years ago: what was once mainly about metal forming and finishing, is now about nano-structures and internal architectures, meta-materials and additive manufacturing, and about carbon and novel organics. This has been driven by a new understanding of materials at the atomic scale, by additive manufacturing technologies, and by the increasing use of novel chemistries – both organic and inorganic. Materials science is increasingly the key to progress across many engineering disciplines: from modern aerostructures and buildings, through energy storage and transmission, to silicon and compound semiconductors for sensing and computing.
The existential threat of climate change has brought a huge focus on new ways of producing, storing and managing energy. Renewable energy, in particular, is seeing unprecedented innovation and investment in all areas: from harnessing solar and wind generation of energy, to storage in batteries and hydrogen derivatives, to new methods of managing decentralised electricity grids. This, in turn, is driving a revolution in foundational technologies of electrical engineering, materials chemistry and computation. Global investment is also unprecedented and with this provides an opportunity for Australia to create a significant national industry in the coming decades.
This talk will discuss this future vision of engineering.

About the speaker
Hugh Durrant-Whyte is the NSW Chief Scientist & Engineer and Natural Resources Commissioner.

From 2016 to 2018, Hugh was Chief Scientific Advisor to the UK Ministry of Defence. From 2014–16 and 2002–2010, he was a Professor and ARC Federation Fellow at the University of Sydney.

From 2010 to 2014, Hugh was CEO of National ICT Australia (NICTA) and, from 1995 to 2010, was Director of the ARC Centre of Excellence for Autonomous Systems and of the Australian Centre for Field Robotics (ACFR).

Hugh is a world-leading authority on machine learning and robotics and their applications in areas that include cargo handling, mining and defence. 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 and 2008 Engineers Australia NSW Engineer of the Year.

In his career, he has worked with many major companies and has co-founded three successful start-up companies. 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 and delivering the automated ‘Mine of the Future’. He is an honorary Fellow of Engineers Australia, a Fellow of the IEEE, a Fellow of the Royal Academy of Engineering, a Fellow of the Australian Academy of Science, and a Fellow of the Royal Society of London.

7. VOTE OF THANKS

8. CLOSE

Dr Donald Hector AM FRSN
Secretary