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ROYAL SOCIETY NEW SOUTH WALES

Monthly Newsletter
April 2023

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A message from the President

Dear RSNSW Communications

Welcome to the Society's regular Bulletin in a new format prompted by the fact that our former Bulletin Editor, Jason Antony, has moved to a new role. This will consume the time he had available to devote to producing our Bulletin using his desktop publishing skills in InDesign. On behalf of the Society, I thank Jason for his exemplary contributions to the Society as Editor of the Bulletin since July 2020.

So much has happened within and without the Society since then but the Bulletin has remained a constant source of information for our membership. Jason's expertise and generosity are most appreciated and will be remembered. Jason has

also contributed to the Society in many other ways, including participating in and taking photographs at many events. We look forward to seeing him at our events as often as possible.

I thank our Webmaster Emeritus Professor Lindsay Botten FRSN for creating the new format in MailChimp and bringing it to readiness in a relatively short time. As do all Council and Committee Members, Lindsay contributes his talents to the Society on an entirely volunteer basis. We salute him for his creativity and innovation.

I draw your attention to the ongoing Council Elections 2023 in the lead-up to our Annual General Meeting (AGM) on 05 April and encourage you to vote if you have not done so already. The first email to members about the election was sent on 13 March. The voting deadline is noon on 03 Apr 2023. Full details about the election, the Society's 2022 Annual Report, the AGM, and the Ordinary General Meeting that evening are available on our website and later in this newsletter.

The Open Lecture on 05 April will be presented by the winner of the Society's 2019 Clarke Medal, Professor Dietmar Müller FAA, of the University of Sydney, on the topic 'Reconstructing ancient oceans, sea-level fluctuations, the deep carbon cycle and biodiversity'. That evening, the Society will resume its pre-pandemic practice of presenting new Members and Fellows with their certificates. I look forward to seeing as many members and guests there as possible.

We have been treated to an array of quality events in Sydney since the first Bulletin for 2023 was published. They include Ideas@theHouse on 02 March, the Annual Dinner and Awards Presentations on 10 March, and the 1311th OGM and Student Award presentations on 15 March. YouTube recordings of Ideas@theHouse and the Student Award presentations can be accessed from within this newsletter.

We held the Society's Annual Dinner and Awards Presentation on 10 March in the Art Gallery of New South Wales. It was a wonderful occasion attended by many members, Award winners (shown in the adjacent photograph), and guests. Steven Miller, Head of Research Library and Archives at the Gallery, delivered an elegant after-dinner speech that blended old and new including through the shared history of our respective organisations. I thank the members of the small group of volunteers who comprised the Dinner Committee – Wendy Enevoldsen, John Hardie, Marian Kernahan, and Bruce Ramage – without whom it would not have been such a success. A gallery of images from the occasion is available from the website for perusal and downloading.

Our Branches have also been active. I attended the recent AGM of the Southern Highlands Branch (SHB). Members the new SHB Committee are listed here. I congratulate Anne Wood FRSN for being elected as Chair and encourage any members in that region to attend the regular events convened by the Branch and consider joining the Branch Committee. I thank Hub Regtop, the outgoing Chair of the SHB for serving in that role for nearly 15 years. Hub's service was also recognised by the award of a Royal Society of New South Wales citation in 2021.

I also attended the recent Hunter Branch AGM. Members of the new Hunter Branch Committee are listed on the Branch's website page. I can report here that Distinguished Emeritus Laureate Professor John Aitken FRSE FRSN will continue as Chair and thank him and all other Committee members for offering their time and energy to their respective roles. In particular, the Society owes a debt of gratitude to three foundation members of the Hunter Branch who have retired from its Committee. They are Professor Natalie Thamwattana FRSN, Professor George Willis FRSN, and Mr Paul Jeans FRSN.

I am pleased to report that on 15 February, in recognition of the Society's contributions to public good, the NSW Government through the Office of the Chief Scientist and Engineer, Professor Hugh Durrant-Whyte, issued a Media Release announcing the extension support for a further three years until FY2027. This additional sponsorship will enable us to employ a 0.6 FTE Communications Officer with the requisite talent and skills to create and implement effective communications strategies that engage our members and increase the Society's impact. I thank Professor Durrant-Whyte and his Office for this continued support.

We work for the Society and for NSW because we understand the need to enhance public discourse on a wide range of topics that are crucial to our future. Society members have excellent ideas to contribute. In that spirit, I look forward to hearing your ideas and suggested ways to bring them to fruition. Do note that after the AGM on 05 April, Council will be reviewing and reconstituting the membership of its Committees. If you have the interest and skills to be considered for any of them, please get in touch.

Susan M Pond AM FRSN FTSE FAHMS
President, Royal Society of NSW

For your diary

- 156th Annual General Meeting and 1312th Ordinary General Meeting and Open Lecture (Wednesday, 5 April, 6.00 AEST for the AGM, immediately followed by the OGM and lecture, Gallery Room, State Library of NSW): *Reconstructing ancient oceans, sea-level fluctuations, the deep carbon cycle, and biodiversity*, Professor Dietmar Müller FAA FAGU (University of Sydney)
- RSNSW Online Lecture 2023-1 (Wednesday, 3 May 6.30 pm AEST, Zoom webinar), *Artificial Intelligence myths debunked — how AI is transforming humanity for the global good*, Professor Michael Blumenstein FACS (University of Technology Sydney)
- 1313th Ordinary General Meeting and Open Lecture (Wednesday 7 June, 6.30 pm AEST, Gallery Room, State Library of NSW): *Making rights a reality — the need for a Human Rights Act for Australia*, Emeritus Professor Ros Croucher AM FAAL, President, Australian Human Rights Commission
- Ideas@theHouse: June 2023, (Wednesday, 14 June 6.00 pm, Government House Sydney by formal invitation and subsequently on YouTube), *Topic: TBA*, Dr Cathy Foley AO PSM DistFRSN FAA FTSE, Australia's Chief Scientist

The Society's complete events program for the year is published in the online Events Calendar, which is updated regularly.

NEWS

Society Fellow, Saul Griffith, featured on ABC Australian Story

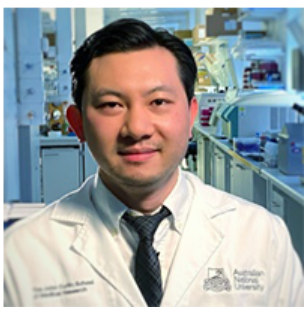
Society Fellow, Saul Griffith FRSN, was featured in the epsiode "The Transformer I Saul Griffith" that appeared on ABC-TV's 27 February 2023 episode of *Australian Story*.

The story provided fascinating insights into Saul's background as a prolific inventor, engineer, successful entrepreneur, and renewable advocate. His passion for developing realistic energy solutions for the climate crisis led to his establishment of *Rewiring America* which attracted the attention of the Biden Administration to help shape the ground-breaking climate legislation which passed in the United States late in 2022.

Now back in Australia and living in Austinmer, just north of Wollongong, Saul started work on *Rewiring Australia*, which he detailed in two presentations to the Royal Society of NSW in 2021 in his two-part presentation on *Our Energy Future:* "Context and Castles" and "Crushed Rocks" — available on the Society's YouTube channel.

The Australian Story program also focused on his latest initiative "Electrify 2515", which he refers to a lighthouse project, that aims to electrify and convert to zero net emissions the suburbs in the 2515 postcode region north of Wollongong.

Academy of Science Honorific Awards



Professor Matthew England FRSN FAA of the UNSW Sydney and Professor Si Ming Man of the Australian National University have been named as winners in the Academy of Science (AAS) Honorific Awards for 2023.

Professor England, the winner of the Society's James Cook Medal in 2019, was awarded the AAS Jaeger Medal — one of the Academy's career-level honorific awards — in the earth sciences for his work on how climate change is reshaping oceans.

Professor Si Ming Man, the winner of the Society's Edgeworth David Medal in 2019, was awarded the AAS Gottschalk Medal — one of the Academy's early-career honorific awards — for his work on uncovering the role of inflammation in health and disease.

The links above access the AAS citations for these two outstanding researchers together with a short video on their contributions to science.

The Council of the Royal Society of NSW warmly congratulates these two outstanding scientists on this recognition of the impact of their work.

New national science priorities: a national conversation

Australia's Chief Scientist, Dr Cathy Foley AO PSM DistFRSN FAA FTSE, has been requested by the Australian Government to lead a national conversation about the revitalisation of Australia's Science and Research Priorities over coming months.

The current list of science priorities dates back to 2015 — a time before gravitational waves had been discovered, when claims of quantum advantage were a grail now being fought over by major players like Google and IBM, before COVID and the breakthroughs in mRNA technologies, and before AI chatbots.

The national conversation is intended to identify challenges, strengths, and opportunities that will inform the development of a draft list of priorities for consideration and further consultation during the year.

Society members who may wish to contribute to the discussion may make a submission on the Department of Industry, Science and Resources website. The website indicates that the Government would like to hear about challenges that could be addressed through science, future opportunities, and strengths that Australia should maintain and build upon. A conversation starter, which sets out the intent and background for the consultation emphasises that the priorities should be community-informed, ambitious and purpose-driven, evidence-based, enduring and responsive, relevant, bounded, and inform investments.

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EVENTS

Annual General Meeting and 2023 Council Elections

156th Annual General Meeting

and

1312th Ordinary General Meeting

Date: Wednesday, 5 April 2022, 6.00 pm AEST
Venue: Gallery Room, State Library of NSW, Shakespeare Place, Sydney
Entry: Society members, $10; Non-members, $20; Students, $5
Registration: Registration through Membes for both the Annual General Meeting and the 1312th Ordinary General Meeting and Open Lecture is required before 2.00 pm on Tuesday, 4 April 2023

While entry to the AGM is for Society members only, all are welcome to the OGM and Lecture

Please click here to register for both the AGM and OGM

Annual General Meeting

Rule 4(c) of the Society's Rules requires that an Annual General Meeting (AGM) must be held in April of each year. The agenda for this meeting is available from this link.

The formal business of the Annual General Meeting, including the election of Council Members, is being conducted via an electronic ballot, in accordance with Rule 18.

Electronic ballot for the 2023 Council Elections

Members, Fellows and Distinguished Fellows, who are financial in 2023, will have received an email from the Society's Returning Officer, via the electronic balloting company, Election Buddy, on 13 March 2023. This email includes a unique ballot link that provides a random, secret access key for each voter. Voter anonymity is assured by ballot settings which ensure that voter choices cannot be linked to any voter.

The **ballot** will run from **Monday 13 March 12.00 noon AEDT to Monday 3 April 12.00 noon AEST** and will address:

- Procedural Business:
  - Confirmation of the Minutes of the 155th Annual General Meeting
  - Confirmation that the Annual Report of Council and the Financial Statements for 2022 be received
  - Confirmation of the proposed Auditors for 2023
- Election of Office-bearers and Council members, namely the:
  - Secretary — from a field of two (2) candidates.

Please note that:

- for each of the positions of President, Vice-President, Treasurer, Librarian, and Webmaster, only a single nomination was received. Accordingly, these Office-bearers will be declared elected at the AGM without the need for a ballot
- for the three vacancies for Ordinary Members of Council, only three nominations were received. Accordingly, the candidates for the three Council Member vacancies will be declared elected at the AGM without the need for a ballot.

In all cases, candidates have been invited to provide an optional statement outlining how their expertise and experience fit them for these roles and will benefit the Society. These statements are available through the links below and also are provided as information on the electronic ballot form.

Office/Role	Candidate
President	Susan Pond AM FRSN
Vice-President	Peter Shergold AC FRSN
Secretary	Donald Hector AM FRSN

	Bruce Ramage MRSN
Treasurer	Bhavin Raval MRSN
Librarian	Stephen Garton AM FRSN
Webmaster	Lindsay Botten FRSN
Councillors	Katherine Belov AO FRSN
(3 positions)	Davina Jackson FRSN
	Christina Slade FRSN

1312th Ordinary General Meeting and Open Lecture

Reconstructing ancient oceans, sea-level fluctuations, the deep carbon cycle and biodiversity

Professor Dietmar Müller FAA FAGU
Professor of Geophysics
University of Sydney

Date: Thursday, 2 March 2023, 6.30 pm AEST
Venue: Gallery Room, State Library of NSW, Shakespeare Place, Sydney
Society Members and Fellows, and members of the public are welcome

Date: Wednesday, 5 April 2023, 6.00 pm for 6.30 pm AEDT
Venue: Gallery Room, State Library of NSW, Shakespeare Place, Sydney
Entry: Society members, $10; Non-members, $20; Students, $5.
Registration: Register for this event using the link in the notice for the 156th AGM before 2.00 pm on 4 April 2023
All are welcome

Please register for this event using the link in the notice for the 156th AGM

Summary: This presentation is a journey through geological time, reconstructing ancient oceans that have little resemblance to the oceans we know today. These reconstructions are enabled by the EarthByte Group's Virtual Earth Observatory, powered by the GPlates software. They represent decades of software development and geodata synthesis to recreate now-vanished ocean basins. These digital maps form the basis for understanding the driving forces of changes in ocean basin volume and long-term sea level, the deep carbon cycle and biodiversity. Our models track oceanic carbon reservoirs through time and demonstrate that the carbon storage and transport capacity of the oceans, from mid-ocean ridges to subduction zones, has increased 5-fold since the breakup of the Pangea supercontinent 200 million years ago, reflecting the emergence of biogenic deep-sea carbonate sediments as the largest carbon reservoir on Earth. Our maps have also been used to reconstruct marine biodiversity. An ocean evolution model over 550 million years, validated with fossil data, shows that modern ocean biodiversity, which is at its highest

level ever, was achieved through the long-term stability of the location of so-called biodiversity hotspots. These are regions of especially high numbers of species located in warm, shallow, nutrient-rich waters. This study also emphasizes that, if current trends continue, projected diversity loss can take millions of years to recover, arguably beyond our own existence as a species.

Dietmar Müller is Professor of Geophysics at the University of Sydney School of Geosciences. He received his undergraduate degree from the University of Kiel, Germany, and his PhD in Earth Science from the Scripps Institution of Oceanography, University of California San Diego in 1993. After joining the University of Sydney he built the EarthByte Research Group, pursuing geodata synthesis through space and time. He is leading the construction of a Virtual Earth Laboratory, assimilating the wealth of disparate geological and geophysical data into an experimental planet. Dietmar's virtual globe software and data are benefiting universities, government organisations, industry and schools worldwide, with end-users across over 190 countries. Novel applications include the development of combined geodynamic, tectonic and surface evolution models unravelling the origins and history of continental landscapes, coastlines, oceans and their environments. He held an Australian Laureate Fellowship from 2009–2014, and is a Fellow of the American Geophysical Union, and the Australian Academy of Science.

RSNSW Online Lecture 2023-1

Artificial Intelligence myths debunked — how AI is transforming humanity for the global good

Professor Michael Blumenstein FACS

Professor and Acting Dean
Faculty of Engineering & IT
University of Technology Sydney

Date: Wednesday, 3 May 2023, 6.30 pm AEST
Venue: Zoom webinar (link to follow)
Entry: No charge
All are welcome

Summary: Michael Blumenstein will speak about the current trends in Artificial Intelligence (AI), both in academia and in business. In his talk, Michael will highlight a number of applications including some of the cutting-edge AI technologies developed at UTS. One such case study will be the research undertaken in collaboration with industry, which was translated into the AI solution: SharkSpotter© – the world's first technology that can be used to detect sharks from video captured by drones or Uncrewed Aerial Vehicles (UAVs).

Michael will demonstrate how AI can be used to enhance and even save people's lives, as well as transform businesses and the economy. Other applications that Michael will present, include CrocSpotter© – a technology for automatically detecting crocodiles in

Northern Queensland. Further examples include AI technology for Drone Detection that has now been deployed in industry to enhance public safety. Michael will demonstrate how AI can be used to advance towards the next frontier of technological innovation. Further discussion will be dedicated to the recent trends with ChatGPT as well as the future of AI and possible directions for attaining the goal of conscious machines.

Michael Blumenstein is currently a Professor and the Acting Dean of the Faculty of Engineering and IT (FEIT) at UTS. Previously, he held the roles of Deputy Dean, and Associate Dean (Research Strategy and Management) in FEIT at UTS where he concluded his role as Head of the School of Software. He formerly served as the Head of the School of Information and Communication Technology at Griffith University, and earlier as the Dean (Research) in the Science, Environment, Engineering, and Technology Group. Michael is a nationally and internationally recognised expert in the areas of automated Pattern Recognition and Artificial Intelligence, and his current research interests include Marine Life and Shark Detection from Video Imagery, Document Analysis, Video-based/multi-lingual Text Detection, and Signature Verification. He has published over 300 papers in refereed books, conferences, and journals. His research also spans various projects applying Artificial Intelligence to the fields of Engineering, Environmental Science, Neurobiology, and Coastal Management. Michael has secured internal/nationally competitive research grants to undertake these projects with funds exceeding AUD$6.5 Million. Components of his research into the predictive assessment of beach conditions have been commercialised for use by local government agencies, coastal management authorities, and in commercial applications.

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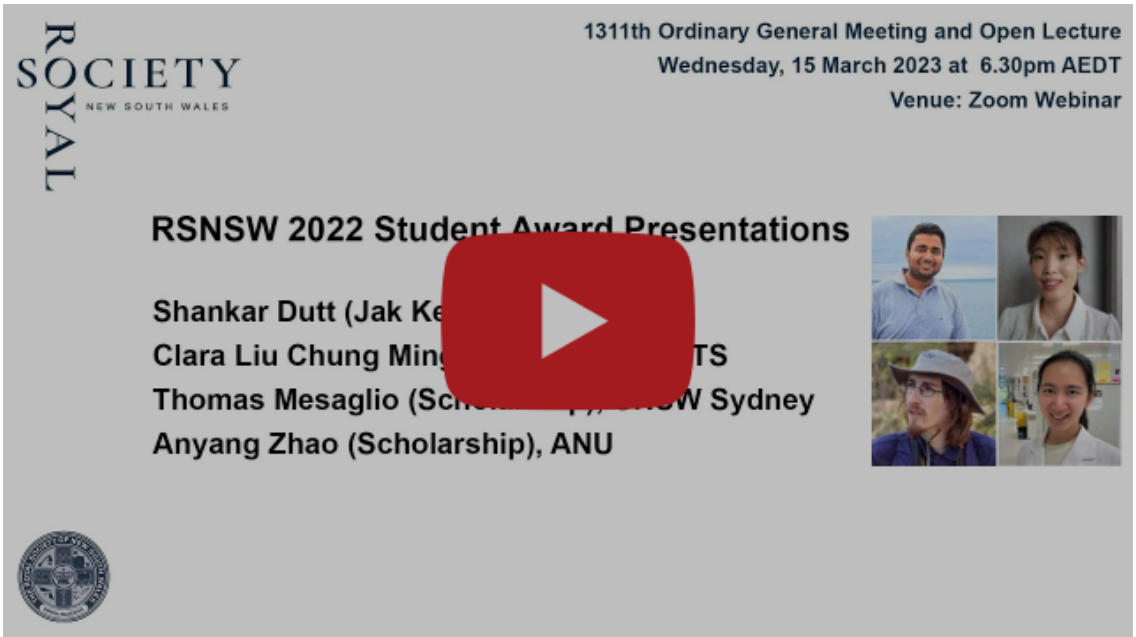
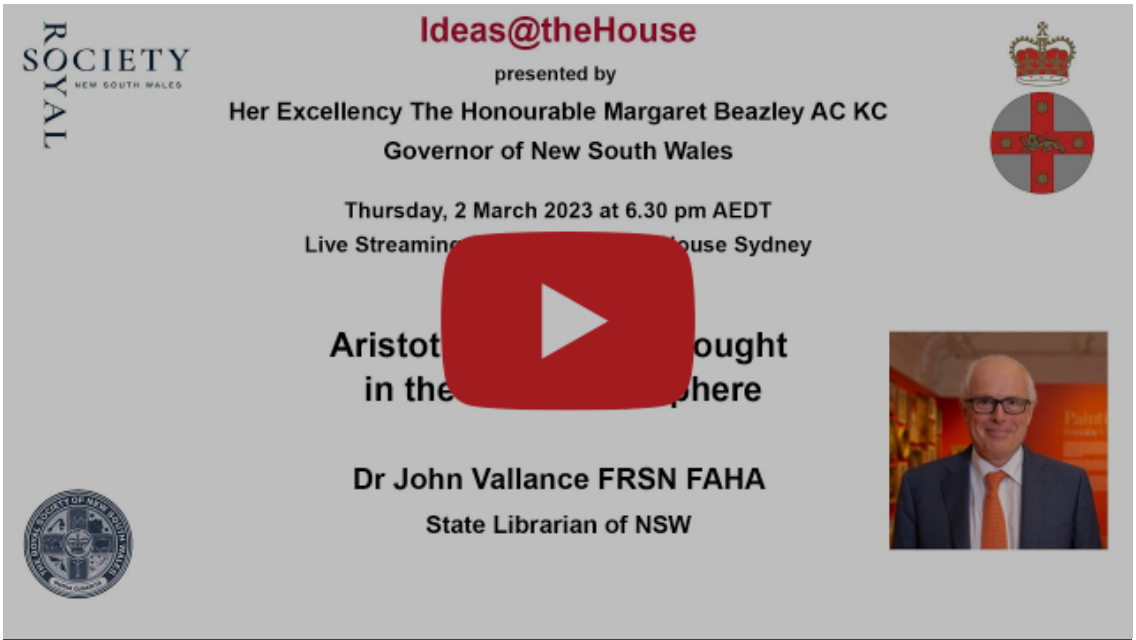
Recordings of Recent Events on YouTube

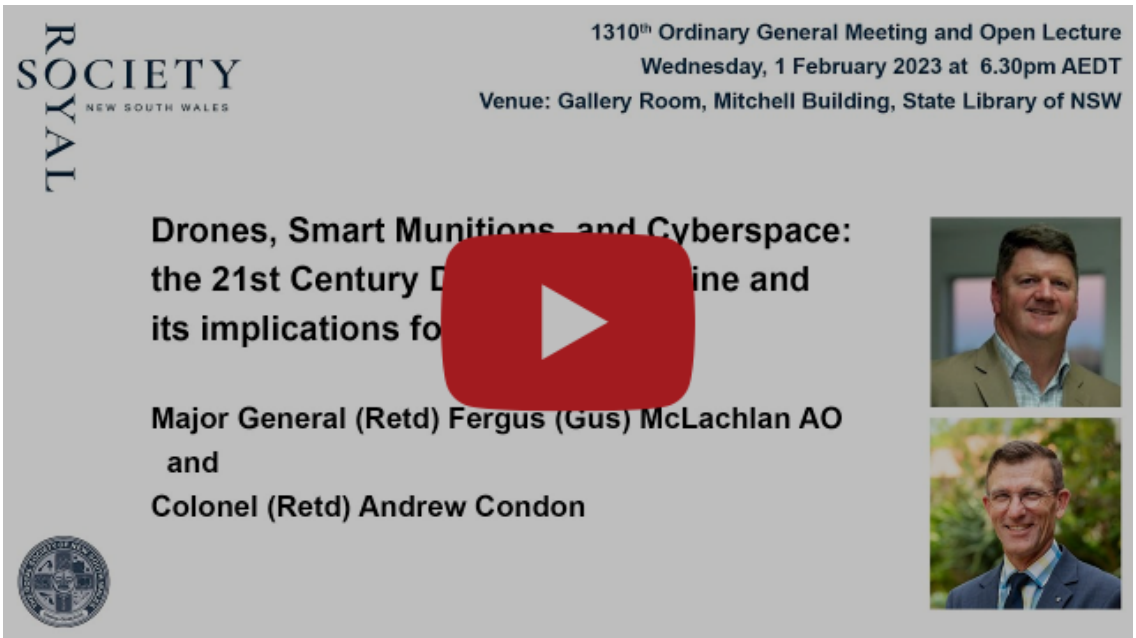


YouTube recording of the 1311th Ordinary General Meeting and 2022 Student Award Presentation from 15 March 2022, featuring Shankar Dutt (ANU), winner of the 2022 Jak Kelly Award, and Clara Liu Chung Ming (UTS), Thomas Mesaglio (UNSW Sydney), and Anyang Zhao (ANU), each of whom were winners of RSNSW

Scholarships for 2022. Information about the talks and the speakers is available from the online event notice.



YouTube recording of Ideas@theHouse held at Government House on 2 March 2023 in which Dr John Vallance FRSN FAHA, State Librarian of NSW, presented on the topic of *Aristotle on life and thought in the sub-lunary sphere*. An abstract of the talk and the biography of Dr Vallance is available from the online event notice.



YouTube recording of the 1310th Ordinary General Meeting on 1 February 2023 on the subject of *Drones, Smart Munitions, and Cyberspace: the 21st Century Defence of Ukraine and its implications for Australia,* featuring Major General (Retd) Fergus (Gus) McLachlan AO and Colonel (Retd) Andrew Condon CSC. An abstract of the talk and the biographies of the presenters is available from the online event notice.

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