



The Royal Society OF VICTORIA

Promoting science since 1854

PATRON: The Hon Linda Dessau AC
Governor of Victoria

PRESIDENT: Mr David Zerman

This Month's Events...



13th July: Joint ATSE Lecture with Professor Gordon Wallace AO
"3D Bioprinting – Printing Parts for Bodies"



27th July: Professor Lynne Selwood AO & Emeritus Professor James Warren
"Ripping Yarns: Two Lives in Zoology"
(Lunchtime Lecture)

August Advance Notice:



17th August: Young Scientist Research Prizes
Competition and Prize Ceremony



24th August: Professor Kate Smith-Miles
"Maximising Impact through Mathematics"
(Lunchtime Lecture)

July 2017 Newsletter

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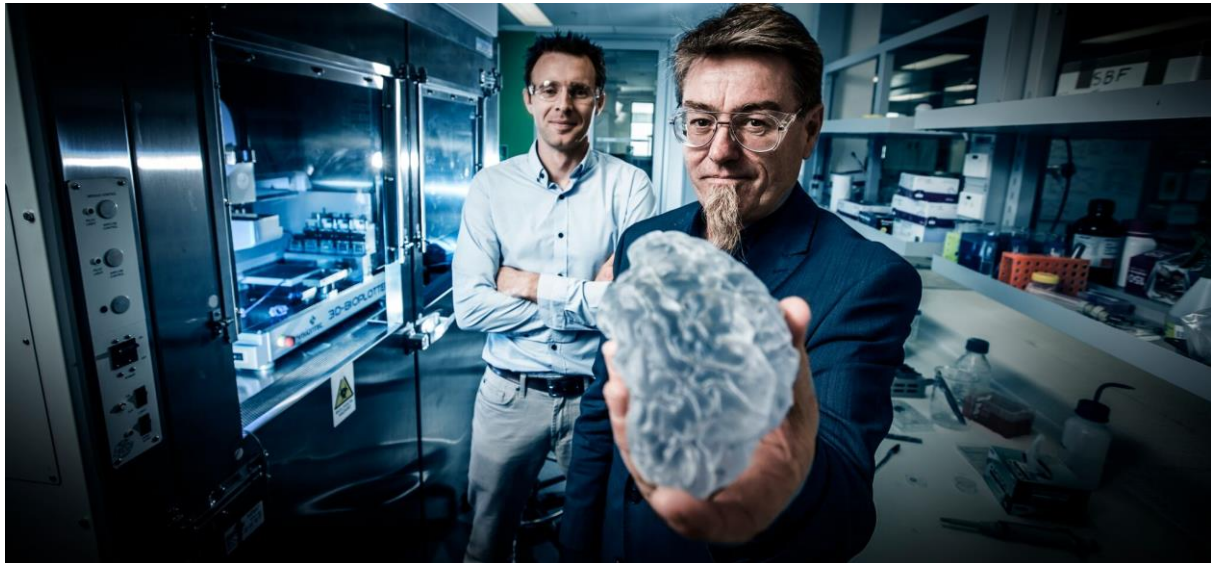
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July Meetings

3D Bioprinting: Printing Parts for Bodies

2017 Joint Lecture with the [Australian Academy of Technology & Engineering](#)



Thursday, 13th July 2017 at 7:00pm.

Speaker: Professor Gordon Wallace AO

Executive Research Director, ARC Centre of Excellence for Electromaterials Science, The University of Wollongong

3D printing has changed the way we think about making things. This is changing many areas of manufacturing, but the most profound impact is in bioengineering.

The ability to create structures from the ground up using a vast inventory of materials including structural biopolymers, proteins and even living cells enables us to tailor the arrangements for the task at hand. Mechanical properties, bioactivity and electroactive materials can be distributed with precision in 3 dimensions. This is enabling us to tackle challenges such as cartilage and corneal regeneration, 3D printed ears for microtia patients, models that help us understand what underpins an individual's sleep apnoea and printed structures for wound healing.

The ability to do this in a low footprint area, with simple hardware, puts the ability to create back in the hands of the creative!

About the Speaker:

Professor Gordon G. Wallace AO is the Executive Research Director of the Australian Research Council Centre of Excellence for Electromaterials Science and Director of the Australian National Fabrication Facility, Materials Node. Based at the University of Wollongong in New South Wales, Professor Wallace is involved in the design and discovery of new materials for use in Energy and Health. In the Health area this involves using new materials to develop biocommunications from the molecular to skeletal domains in order to improve human performance. In the Energy area this involves use of new materials to transform and to store energy, including novel wearable and implantable energy systems for the use in Medical technologies.

He was appointed as an Officer of the Order of Australia 26 January 2017. He received Wollongong's award for Innovation in 2017 and served as Wollongong's Australia Day Ambassador. He received the Eureka Prize for Leadership in Science and Innovation in 2016. He was appointed to the Prime Ministers Knowledge Nation 100 in 2015.

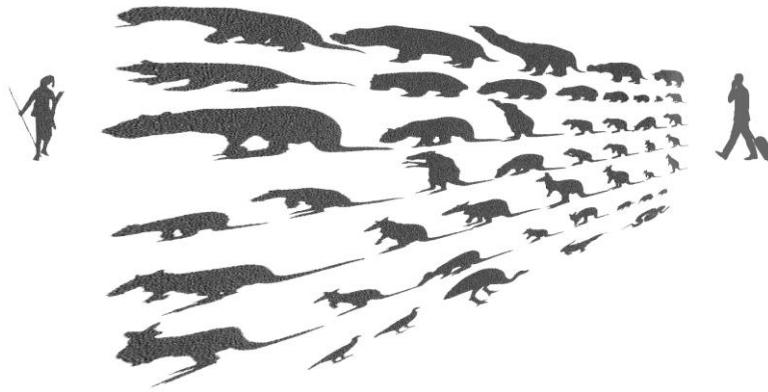
Gordon is a Fellow of the Australian Academy of Science, Australian Academy of Technological Sciences and Engineering (ATSE), Institute of Physics, and Royal Australian Chemical Institute (RACI). He is a corresponding member of the Academy of Science in Bologna.



Food + Drink + Company available from 6:15 at members' & guests rates. **A free public lecture from 7pm, bookings essential! Register online now at <https://rsv.org.au/events/3d-bioprinting/>**, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au.

Ripping Yarns: Two Lives in Zoology

Lunchtime Lecture



Thursday, 27th July 2017 at 12:30pm.

Speakers: Professor Lynne Selwood AO
School of BioSciences, The University of Melbourne

Emeritus Professor James Warren
School of Biological Sciences, Monash University

There are few fields of science that combine the excitement of exploration and discovery with the alarm of an unfolding crisis quite like Zoology. Our two distinguished speakers began their careers in the mid-twentieth century, just as the Anthropocene was getting started. Working in fields spanning palaeontology, evolutionary and developmental biology, Professors Lynne Selwood and James Warren have a unique perspective on the development of their fields of inquiry and the application of their science to the challenges facing our planet's biodiversity, both locally and globally.

Join Lynne and Jim as they discuss their reasons for choosing Zoology as a field of study and inquiry, reflect on their experiences in the field and paint a picture of the interesting times a Zoologist can look forward to in their career.



Professor Lynne Selwood AO lived and worked in NSW and London before settling in Melbourne. Here she further explored her interests in the mechanisms and evolution of early mammalian development, using captive breeding and reproductive technology to rescue endangered marsupials and assert fertility control of overabundant marsupials.

Lynne served on the Society's Council for thirteen years and was the first woman to be elected President of the Royal Society of Victoria (2010 - 2013). Lynne continues to oversee the Society's affairs through her lifetime appointment as a Trustee.

In 2017, Lynne was made an Officer of the Order of Australia (AO) for distinguished service to tertiary education in the field of reproductive biology as an academic, researcher and author, to the conservation of marsupial animals, and to the promotion of science.



Emeritus Professor James Warren's move to Australia from the United States in 1962 catalysed the beginning of a long and distinguished career at Monash University. Upon his arrival Jim took up a lectureship in the Department of Zoology and Comparative Anatomy (now the School of Biological Sciences). Jim's previous research had taken him to far flung reaches of the globe, working as a mammalogist with an ecological survey of the arctic regions of Alaska and also studying the major paleontological collections in the USA.

He brought his passion for evolutionary biology to his new role, which led to Monash becoming the first University in Australia to actively research vertebrate palaeontology. In 1968 Jim was appointed as Professor and Head of Department, a position he filled for 26 years until appointed as Dean of the Faculty of Science (1994-1996), followed by an appointment as the Pro Vice-Chancellor of Monash University's Malaysian campus. Upon his retirement in 2000, Jim was appointed as Emeritus Professor of Biology at Monash.

Eventbrite

Register online now at <https://rsv.org.au/events/two-lives-zoology/>, call or email the RSV office to secure your place: 9663 5259, rsv@rsv.org.au.

RSV Fundraiser: the Ellery Theatre Project



As a community-based, not-for-profit organisation, the Royal Society of Victoria has been promoting science since its beginnings in 1854.

Since those days, methods and styles of communication have changed beyond the imagination of our earliest members and presenters. To enable the wider Victorian community (and potentially, those interstate and overseas) to engage with our fascinating talks, forums and discussions with Victorian scientists and science communicators about their exciting work, the Society is planning a major audio visual upgrade of our heritage listed Ellery Theatre so we can broadcast our events, forums and presentations in an engaging, interactive format to the broader Victorian community, further providing content via a dedicated online channel and media partners for access after delivery.

This accords with our strategic goal to engage Victorians in the excitement of scientific discovery and celebration of our high achieving scientists at all stages of their career development.

How the Funds Will Be Used

The costs of the project are largely comprised of audio visual equipment including: cabling, lighting, cameras, microphones, amplifiers, and lecture capture technology. The project includes the installation of an internal Ethernet network and connection to a broadband internet network to facilitate a reliable connection to audiences interacting with our events from regional Victoria. Much of this infrastructure will be installed in what is currently our archive room, which will be transformed into a "bio box" for audio-visual operators to work in remotely without undue disruption to event proceedings or occupying the limited seating space available to members and guests in our small theatre.

While specialised technical labour is a substantial line item in the project, the project is also constrained by the need to preserve and enhance the beautiful heritage decor of our 1859 Joseph Reed-designed building and its gorgeous Victorian-era interiors. This means a lot of "work-arounds" during installation and extensive project management to secure the requisite heritage permits for this transformative work to proceed.

The Challenge

We aim to raise \$50,000 from our community of members and friends, with the additional \$180,000 support from philanthropic trusts and foundations, corporate supporters and government partners. This fundraiser is a vital first step, demonstrating the commitment of the Society and its members to the project to our prospective funding partners and supporters. It is a large undertaking for the Society, which has not seen a substantial technical investment in its facilities for some decades, in which time information and communication technology has undergone radical change.

To keep pace with the march of technology, it will be important for the installation to anticipate and accommodate upgrades to equipment, cabling and resident expertise at suitable future intervals. This will inform our annual budgets for recurrent operating expenditure.



Can you help? Please make your tax deductible donation now at <https://rsv.org.au/ellery-theatre-project/>, or call or email the RSV office to discuss your contribution: 9663 5259, rsv@rsv.org.au.

The Order of Australia – Queen's Birthday Honours

The Council of the Royal Society of Victoria is delighted to record the honours conferred on the following RSV Members:

Professor Lynne Selwood AO

For distinguished service to tertiary education in the field of reproductive biology as an academic, research and author, to the conservation of marsupial animal, and to the promotion of science.

Dr Beth Gott AM

For significant service to the biological sciences as an ethnobotanist, specialising in the study of the use of native plants by Indigenous people.

Dr Francis Leahy AM

For significant service to surveying and mapping through research and innovation, and to education as a lecturer and mentor.

Warmest congratulations to Lynne, Beth and Frank! What a pleasure to see your contributions to science and the community recognised so appropriately.

RSV Medal for Excellence in Scientific Research



Professor Lloyd Hollenberg receives the 2016 Research Medal from Victoria's Lead Scientist, Dr Amanda Caples.

This is our last call for nominations for the Royal Society of Victoria's prestigious **Medal for Excellence in Scientific Research 2017** in **Category I: Biological Sciences (non-human)**.

This category includes research in the disciplines of **Agriculture, Biochemistry, Botany, Cell Biology, Ecology, Forestry, Zoology**, and related areas of non-human biological sciences.

Award criteria: The award of the medal is based on demonstration of the candidate's excellence and leadership in scientific research. The candidate's research work shall have been carried out in Australia (including its territories), or on Australia, with preference for work done in Victoria, or on Victoria.

Nominations close at 5pm on **31 July, 2017**. Full details on criteria and eligibility are available from <https://rsv.org.au/awards-and-prizes/research-medal/>.

Nominations for RSV Membership

Nominations for membership of the Society have been received on behalf of:

Dr **Cheryl TAYLOR**, CSIRO Research Scientist
Professor **Charlie Changli XUE**, Executive Dean of Health & Biomedical Sciences, RMIT University
Professor **Paul Rene GORRY**, Deputy Dean, Research & Innovation, RMIT University
Dr **Mary TOLCOS**, Senior Research Fellow, RMIT University
Ms **Upulie DIVISIKERA**, Doctoral Student, Science Communicator, Monash University
Dr **Katherine Jean MACK**, Physicist, University of Melbourne
Dr **Morgan SALETTA**, Sessional Lecturer, University of Melbourne
Mr **Kwaku Dad ABU-BONSRAH**, PhD Student, University of Melbourne
Mr **Carlos Andrew AGUDELO SERNA**, PhD Student, The University of Melbourne
Mr **Taimur AHMED**, PhD Student, RMIT University
Dr **Sheikh Mohammad ALIF**, PhD Student, The University of Melbourne
Dr **Niloufar ANSARI**, PhD Student, The University of Melbourne
Mrs **Faiza BASHEER**, PhD Student, Deakin University
Ms **Katrina Anne BLACK**, PhD Student, The University of Melbourne
Mr **Samuel Charles BOONE**, PhD Student, The University of Melbourne
Ms **Emma Ruth Lucille BRISSON**, PhD Student, The University of Melbourne
Mr **Cesar Augusto CASTANEDA HERRERA**, PhD Student, The University of Melbourne
Mrs **Miaomiao CHENG**, PhD Student, La Trobe University
Ms **Olga Maria DRATH**, PhD Student, The University of Melbourne
Miss **Rachael Marlow FOWLER**, PhD Student, The University of Melbourne
Ms **Yujing GAO**, PhD Student, The University of Melbourne

Mr **Shadabul HAQUE**, PhD Student, Monash University
 Ms **Sarah Alexandra LARCOMBE**, PhD Student, Monash University
 Mr **Shuai LI**, PhD Student, The University of Melbourne
 Mr **Ming-Hui KAO**, PhD Student, The University of Melbourne
 Mr **Joshua NEWSON**, PhD Student, The University of Melbourne
 Mr **Alexander John NORTON**, PhD Student, The University of Melbourne
 Mr **Patrick James OWEN**, PhD Student, Deakin University
 Mr **Daniel John REARDON**, PhD Student, Monash University
 Mr **Moeen RIAZ**, PhD Student, The University of Melbourne
 Ms **Stefanie Marcella ROG**, PhD Student, Monash University
 Ms **Shazia Nathalie RUYBAL PESANTEZ**, PhD Student, The University of Melbourne
 Miss **Julie SANCHEZ**, PhD Student, Monash University

Unless Members request a ballot, they will be considered for election by Council and if elected, will be announced at the Ordinary Meeting of the Royal Society of Victoria to be held on 24th August.

Recently elected members who have not yet signed the Society's membership book are invited to attend the 13th July meeting to be formally welcomed as members. **Please inform the office if you plan to attend, so we can prepare your membership certificate for collection.**

The Big Ideas Book Club

The Knowledge Wars

Wednesday, 26 July 2017 @ 6:30pm

THE KNOWLEDGE WARS



"A hugely important book for those living in the data-saturated 21st century." TIM FLANNERY

PETER DOHERTY

July's edition of [The Big Ideas Book Club](#) features one of our favourite science authors, Nobel Laureate (and RSV fellow) Professor Peter Doherty! I had the joyful experience of discussing the book with Peter last year at an [Embiggen Books](#) event and can attest to it being a fascinating exploration of what is (and is not) valid in the increasingly politicised sphere of science in public with an eminent (yet thoroughly down to Earth) Australian thinker. Grab your copy from our friends at Embiggen Books, read up over July, then join in to discuss its

juicy insides! No cost to participate – register to attend online at <https://www.meetup.com/en-AU/Big-Ideas-Book-Club/events/240551670/> . - Mike

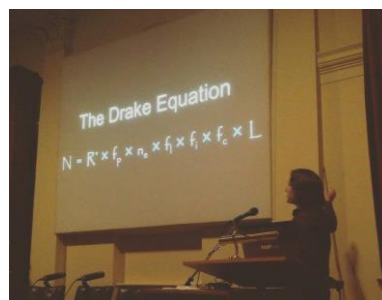
Exoplanets & Life in Space

8th June Panel Discussion



It was a real pleasure to hear four short, sharp, engaging presentations from some terrific science communicators, followed by an insightful audience discussion chaired by one of the country's most eminent astrophysicists! Big thanks to Associate Professor Alan Duffy, Upulie Divisekera, Dr Katie Mack, Dr Morgan Saletta and Professor Rachel Webster for an outstanding exploration of what's "near Earth," and in our near future!

Dr Katie Mack mapped out the 3,490 exoplanets confirmed in our galactic neighbourhood and explored the Drake Equation, which sets criteria for assessing the likelihood of



intelligent life existing elsewhere in the universe.

Upulie Divisekera explored what constitutes "life," identifying the micro-organisms that can survive and thrive in conditions too extreme for complex multi-cellular life



forms to withstand. These conditions were similar to those under which life emerged on Earth, and if we take this into consideration, then "the habitable zone" for extraterrestrial life widens. The precursors to life - amino acids, proteins etc - can be created

in a wide range of conditions, but the emergence of life itself remains a complex puzzle.

A/Prof Alan Duffy explored what the light from distant stars tells us about the planets that orbit them, with the unique chemical signatures of exoplanet atmospheres disrupting the light spectrum in different ways to

reveal themselves to observers on Earth. Aside from detecting potential organic activity, it also gives us the ability to detect high concentrations of industrial pollutants like CFCs as an indicator of an advanced (yet possibly suicidal) civilisation. As for probing the solar system and beyond; we can't run a space program via remote control from Earth over such vast distances, and the development of collaborative machines that network and interact both with our mission control centres and each other to "think on the ground."

Dr Morgan Saletta explored our cultural engagement with life in space, from the space habitats developed through engineering design and "hard" science fiction, to the possibilities of reworking some very familiar technologies such as the igloo of the Inuit peoples, which has enabled humans to survive, adapt and thrive in some of the Earth's least hospitable conditions. Igloos on Mars! Also, terrible space fashion! Just awful. You heard it here.



From left: Professor Rachel Webster (Chair), Professor Sandra Rees, Dr Katie Mack, RSV President David Zerman, Uplie Divisekera, A/Professor Alan Duffy, Dr Morgan Saletta, RSV Science Program Chair Dr Kevin Orrman-Rossiter (vote of thanks).

It was a far ranging discussion in which ethics, conservation, machine life, the Fermi paradox, the commercialisation of near-Earth resources and the need to protect a pristine solar system from the human species all came within scope. Huge thanks to our panellists, Chair and event organiser Professor Sandra Rees for a wonderful evening – it was a lovely event to have in the Ellery Theatre, named for the remarkable Dr Robert Lewis Ellery, founder of the Melbourne Observatory, Victoria's Chief Astronomer for 42 years and the Royal Society of Victoria's longest serving President (19 years!).

Meteorites & Cosmic Dust: Insights to the Early Solar System & Earth

22nd June - Joint GSAV Event

2017 A W Howitt Lecture



In conversation with David Zerman (left): Andy got "interested in rocks" as a kid, and was encouraged by a supportive Dad to pursue geology.

Another year, another packed-out Howitt Lecture! Planetary science holds so much fascination for so many people, and it's always a pleasure to co-host this annual event with our friends and colleagues from the **Geological Society of Australia (Victoria Division)**.



This year Dr Andy Tomkins from the Monash School of Earth, Atmosphere and Environment took us on the hunt for meteorites on the Nullarbor Plain and the Pilbara, searching for chunks of our neighbouring asteroids and planets that fall to earth

as meteorites which, despite the intense heat of entry to the Earth's atmosphere, preserve the ancient chemical and geological record of the early solar system within.

A particularly interesting aspect of Andy's work with colleagues and students at Monash is the exploration of "palaeo-atmospheres." Mars meteorites are commonly found, preserving the ancient gas ratios of the red planet melded into their rock.

Through comparing rock of similar ages from Earth and Mars, very different early conditions of the two planets are demonstrated, most distinctively the gradual increase of oxygen on Earth during the Archaean Eon that correlates with the emergence of early life.

Right: RSV President David Zerman, GSAV Chair Professor David Cantrill (vote of thanks) and presenter Dr Andy Tomkins.



A fascinating presentation on planetary science from an excellent presenter. Grateful thanks to Dr Andy Tomkins for sharing the work of his talented team of meteorite hunters at Monash University!

Science Promotion Crowd Funding Projects

Aside from our all-important **Ellery Theatre Project** (!), there are a number of initiatives involving our members and friends that we encourage you to consider supporting.

Beckler's Botanical Bounty and the Flora of Menindee

RSV Member: Dr Beverley Wood.

We are seeking support and financial assistance for this unique Project. It is creating beautiful and scientifically accurate botanical paintings and pressed botanical specimens of the 120 plant species on the National Herbarium of Victoria list, as collected in 1860 by **Dr Hermann Beckler** in the vicinity of Menindee (south-east of Broken Hill).

Dr Beckler was a member of the Supply Party of the Victorian (Burke and Wills) Exploring Expedition, and our exceptional work is based



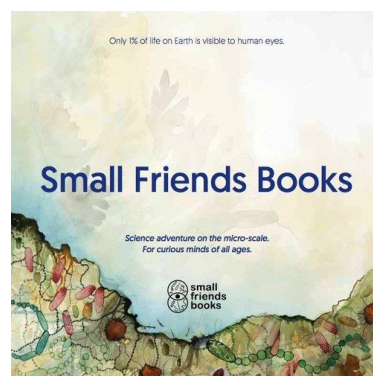
on his original collection. He found many plants in the Menindee area and sent the pressed plants to Melbourne in 1861 where they were identified by Dr Ferdinand Mueller. They were then preserved for posterity as a national treasure in the National Herbarium of Victoria. One hundred and fifty years later our collection will now facilitate a pictorial and botanical history for each plant and the region at the two time intervals.

More information and tax deductible donations: <https://australianculturalfund.org.au/projects/becklers-botanical-bounty-of-menindee/>.

Small Friends Books

RSV Member: Dr Gregory Crocetti.

"The role of the infinitely small is infinitely large."
Louis Pasteur



Learning Science through Story

Our goal is to make the invisible, visible.

99% of life on Earth is comprised of microbes, such as bacteria, viruses and protozoa. 99.9% of these microbes are not just beneficial,

they are essential to the health of all living entities and ecosystems. And yet, most children are taught to believe that microbes are harmful. We need new stories about our small friends!

Small Friends Books reimagine the world from the point of view of microbes. This series of picture books is created by a group of artists, scientists, writers and educators who collaborate to bring this invisible world to life.

We need your help to grow this series through donations, sponsorships and advocacy.

More information and tax deductible donations: <http://www.smallfriendsbooks.com/supportus>.